



Recirculated Draft Environmental Impact Report

Marja Acres Project

SCH No. 2018041022

Carlsbad, California

June 2020

Prepared for

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Appendices

The following technical reports are included in the Recirculated Draft EIR. These reports have been revised and replace the corresponding technical reports previously provided in the April 2019 Draft EIR.

Appendix B Air Quality and Greenhouse Gas Emissions Analysis Technical Report

Appendix J Marja Acres VMT Analysis

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1 Introduction

1.1 Background

1.1.1 Marja Acres Draft EIR (April 2019)

The Marja Acres Draft EIR (April 2019) was prepared to disclose potential environmental effects of the project and included a description of the project, an assessment of its potential environmental effects, a description of feasible mitigation measures to reduce significant effects that were identified in the Draft EIR, and consideration of alternatives that could address potential impacts.

In accordance with the California Environmental Quality Act (CEQA), the Draft EIR was distributed for a 45-day public review and comment period beginning on April 15, 2019 and ending on May 29, 2019. Copies of the Draft EIR or notice of availability of the Draft EIR were sent to various state, regional, and local agencies, as well as interested organizations and individuals.

1.1.2 Marja Acres Recirculated Draft EIR (May 2020)

Subsequent to the public review period for the Marja Acres Draft EIR (April 2019), the city determined that due to revisions to portions of the Draft EIR (April 2019), recirculation of certain portions of the Draft EIR was required based on the criteria set forth in accordance with Section 15088.5 of the CEQA Guidelines. Section 15088.5 of the CEQA Guidelines states:

“A lead agency is required to recirculate an EIR when significant new information is added to the EIR after public notice is given of the availability of the draft EIR for public review.” Significant new information includes “a new significant environmental impact [that] would result from the project or from a new mitigation measure proposed to be implemented” or “a feasible project alternative or mitigation measure [that is] considerably different from others previously analyzed [that] would clearly lessen the environmental impacts of the project.”

Further, because the revisions are limited to a few chapters of the draft EIR, only those chapters are included in this Recirculated Draft EIR. These chapters and the associated revisions are discussed in Section 1.4.

1.2 Decision to Recirculate

Subsequent to the close of the 45-day public review period for the Draft EIR (April 2019), additional changes and revisions have been made to the Draft EIR related to the evaluation of greenhouse gas emissions/climate change and transportation/circulation. The following provides an explanation for the change in approach to the evaluation of each of these environmental topics from that previously analyzed in the Draft EIR (April 2019).

1.2.1 Greenhouse Gas Emissions/Climate Change

The greenhouse gas emissions analysis provided in the Draft EIR (April 2019) relied on the project's consistency with the city's Climate Action Plan (CAP). The greenhouse gas (GHG) emissions analysis provided in this Recirculated Draft EIR utilizes an efficiency metric threshold.

Explanation

The CAP, adopted in 2015, sets a baseline for GHG emissions, forecasts future emissions, and establishes a long-term strategy to reduce emissions. The CAP was prepared concurrently with the City's General Plan and includes actions to carry out the General Plan's goals and policies, consistent with the Community Vision articulated during Envision Carlsbad. The CAP is also correlated with the General Plan EIR, with the CAP GHG emissions reduction target synchronized with the EIR. Emissions reduction targets are established through 2035 and are achievable through enforceable measures, and monitoring and reporting processes (Climate Action Plan Checklist Consistency, 2019). These GHG reductions are consistent with the state's goals to reduce GHG emissions to 1990 levels by 2020 and by 80% below 1990 levels by 2050 (City of Carlsbad, 2015a). For individual projects, consistency with the CAP is determined through compliance with CAP-implementing ordinances.

On January 13, 2020, the City Attorney's office released a memorandum (as presented within the January 21, 2020 City Council Agenda materials) detailing that the vehicle miles traveled (VMT) calculation used in the CAP was based on an incorrect input resulting in lower GHG emissions reported in the inventory (City of Carlsbad 2020). The memorandum concluded that the emissions forecasts for 2020 and 2035 were no longer accurate and the city may not meet the GHG targets for those years. Further, it concluded that the CAP was no longer considered a qualified GHG reduction plan under CEQA Guidelines Section 15183.5 and could not be used to tier off for determining significance of individual projects' GHG emissions. However, City ordinances adopted to implement the CAP continue to be in effect and projects would need to comply with all applicable ordinances.

The city is preparing an update to the CAP and it is anticipated that the city will have a qualified CAP prior to completion of the Final EIR for the Marja Acres project. However, the applicant has prepared a stand-alone GHG analysis for purposes of determining the significance level of the project's GHG emissions as they relate to CEQA (rather than tiering off the CAP, which is currently in the process of an update). It is anticipated that the city's new qualified CAP will not require any additional GHG reduction measures for the Marja Acres project, and that the project's GHG analysis will be sufficient to demonstrate consistency with the new CAP. This is because the project's GHG analysis relies on meeting a quantitative metric derived from data anticipated to be used in the updated CAP. In addition, the project would comply with all applicable City ordinances, including those adopted to implement the CAP.

1.2.2 Transportation/Circulation

The transportation/circulation analysis provided in the Draft EIR (April 2019) utilized a Level of Service (LOS) threshold for the evaluation of CEQA impacts on roadway segments and intersections. The transportation/circulation analysis provided in this Recirculated Draft EIR utilizes a VMT analysis for determining CEQA impacts.

Further, the previous analysis provided in the Draft EIR (April 2019) included an evaluation of the project's compliance with the city's Growth Management Program and Multi Modal Level of Service (MMLOS). These analyses has been removed as part of the Recirculated Draft EIR.

Explanation

CEQA Analysis - Level of Service Thresholds for roadway segments and intersections. The passage of Senate Bill 743 (SB 743), and updates to the CEQA Guidelines have resulted in a shift in the measure of effectiveness for determining transportation impacts from LOS and vehicular delay to VMT. VMT analyses are required for use in all California Environmental Quality Act (CEQA) documents no later than July 1, 2020.

Within the State's CEQA Guidelines, these changes include the elimination of Auto Delay, LOS, and similar measurements of vehicular roadway capacity and traffic congestion as the basis for determining significant impacts. The guidance identifies VMT as the most appropriate CEQA transportation metric, and eliminated Auto Delay/LOS for CEQA purposes statewide. The justification for this paradigm shift is that Auto Delay/LOS impacts lead to improvements that increase roadway capacity and therefore induce more traffic and GHG emissions. The legislation was also intended to incentivize development in and around Transit Priority Areas (TPAs) and High-Quality Transit Corridors (HQTC's), and to encourage high density infill and mixed-use projects.

The VMT analysis provided in this Recirculated Draft EIR has been prepared based on guidance from the city, utilizing methodologies presented in its Draft *Vehicle Miles Traveled (VMT) Analysis Guidelines* (March 27, 2020).

Growth Management Program - Level of Service Performance Standards. The city conducts annual monitoring and reporting on GMP compliance, including for circulation. In any given year, a deficiency in GMP facilities may be reported as a result. After the close of the previously-released Draft EIR (April 2019) comment period, city staff reported on the 2017-2018 monitoring circulation facilities, including within Local Facilities Management Plan (LFMP) Zone 1 where the proposed Marja Acres project is located, that did not meet GMP LOS D performance standards for circulation. When this occurs, the City Council addresses these deficiencies in accordance with the city's GMP. Development within a LFMP zone with a GMP deficiency can proceed when adequate infrastructure is financially guaranteed to meet demand or other options are adopted by the City Council to address the deficiency.

However, in accordance with Public Resources Code Section 15064.3, VMT has replaced LOS as the measure for evaluating transportation impacts under CEQA. Per CEQA Guidelines Section 15064.3(a), "a project's effect on automobile delay [what LOS measures] shall not constitute a significant environmental impact" under CEQA.

As a result of the recent changes in the CEQA thresholds related to the evaluation of vehicular traffic, projects in the City of Carlsbad will continue to be required to evaluate LOS for vehicles, pedestrians, bicycles and transit to ensure they comply with the GMP. However, any deficiencies identified through the GMP evaluation are project issues, not environmental impacts, and are therefore addressed outside of the CEQA context. Due to this change in state law, the GMP circulation and MMLOS discussions have been removed from EIR Section 5.14 Transportation/Circulation and replaced with the VMT analysis now required under CEQA.

1.3 Public Review and Comments

1.3.1 Comments are Limited to Recirculated Draft EIR

CEQA Guidelines Section 15088.5 describes the procedures for recirculation of portions of an EIR; subsection (f)(2) provides that, when an EIR is revised only in part and the lead agency is recirculating

only the revised chapters or portions of an EIR, the lead agency may request that reviewers limit their comments to the revised chapters or portions of the recirculated EIR.

The comments submitted during the earlier circulation period for the Draft EIR (April 15, 2019 to May 29, 2019) that relate to chapters or portions of the document that were not revised and are not recirculated here will be responded to as part of the Final EIR. The city will respond during this recirculation to comments submitted on this Recirculated Draft EIR and the specific chapters and portions that are part of this recirculation. Both sets of comments (Draft EIR circulated from April 15, 2019 to May 29, 2019) and this Recirculated Draft EIR will be included in the Final EIR.

THE CITY OF CARLSBAD REQUESTS THAT REVIEWERS LIMIT THEIR COMMENTS TO THE PORTIONS OF THE DRAFT EIR THAT ARE REVISED AND RECIRCULATED IN THIS DOCUMENT. COMMENTS RECEIVED ON THE PREVIOUSLY CIRCULATED DRAFT EIR WILL BE RESPONDED TO IN THE FINAL EIR AND NEED NOT BE RESUBMITTED.

1.3.2 Availability of Recirculated Draft EIR

In accordance with Governor Newsom's Executive Order No. N-54-20 in effect during the COVID-19 public health emergency (described in more detail in Section 1.5 below), the Recirculated Draft EIR with technical appendices is available online at: <http://www.carlsbadca.gov/services/depts/planning/agendas.asp>. If you do not have access to the internet, you may contact the project planner, Teri Delcamp, at teri.delcamp@carlsbadca.gov to request a CD with a copy of the Recirculated Draft EIR, or to discuss other options.

The Recirculated Draft EIR will be available for a 45-day period for review and comment by the public and public agencies from June 5 to July 20, 2020. Pursuant to Section 15204 of the CEQA Guidelines, in reviewing the Recirculated Draft EIR, persons and public agencies should focus on the sufficiency of the recirculated portions of the document in identifying and analyzing the possible impacts on the environment and ways in which the significant effects might be avoided or mitigated. Comments are most helpful when they suggest additional specific alternatives or mitigation measures that would provide better ways to avoid or mitigate the significant environmental effects.

Comments on the Recirculated Draft EIR must be received no later than July 20 at 5:00 P.M. (45-day public review period) and shall reference the project name: Marja Acres Recirculated Draft EIR. Please submit all comments in writing to the following City of Carlsbad contact:

City of Carlsbad Planning Division
ATTN: Teri Delcamp, Principal Planner
1635 Faraday Avenue
Carlsbad, CA 92008
Or by email at teri.delcamp@carlsbadca.gov

Additionally, the originally-circulated Marja Acres Draft EIR (April 2019) remains available online and can be viewed on the City of Carlsbad website at: <http://www.carlsbadca.gov/services/depts/planning/agendas.asp>. However, this document is available only for reference to assist with review of the Recirculated Draft EIR. The City will not accept or consider any additional comments on the originally circulated Draft EIR (April 2019). The comments submitted during the earlier circulation period for the originally-circulated Draft EIR (April 15, 2019 to May 29, 2019) that relate to chapters or portions of the document that are not being revised and recirculated will be responded to as part of the Final EIR. Therefore, comments previously submitted on the originally-circulated Draft EIR (April 2019) need not be resubmitted.

For additional information, please contact Teri Delcamp at teri.delcamp@carlsbadca.gov.

1.4 Revised Portions of the Draft EIR

Under State CEQA Guidelines Section 15088.5(c), if a revision to an EIR is limited to a few chapters or portions of the EIR, only chapters or portions that have been modified need to be recirculated. Consistent with CEQA Guidelines Section 15088.5(c), this Recirculated Draft EIR contains only the portions of the Draft EIR (April 2019) that have been revised and replaced. The following summarizes the revisions to the Draft EIR chapters that are provided in this Recirculated Draft EIR.

Chapter 2: Executive Summary

This chapter contains revisions to the text of the Draft EIR, as follows:

- Table 2-1, Summary of Project Impacts and Proposed Mitigation Measures, and Table 2-3, Comparison of Alternative Impacts to Proposed Project, have been revised to reflect revised GHG and Transportation/Circulation analysis and conclusions of significant and corresponding mitigation measures.

Although there are no other changes in this chapter, the remainder of the Executive Summary is included to provide context for the revisions.

Section 5.7: Greenhouse Gas Emissions/Climate Change

This chapter contains revisions to the draft EIR, as follows:

- The potential Greenhouse Gas Emissions/Climate Change impacts of the proposed project were reevaluated without reliance on the city's CAP, but rather under an efficiency metric threshold.

Section 5.14: Transportation/Circulation

This chapter contains revisions to the draft EIR, as follows:

- The CEQA analysis as it relates to roadway and intersection LOS has been replaced with the now required VMT analysis as explained in the preceding text.
- The GMP performance standard analysis has been removed from this chapter as explained in the preceding text.
- The MMLOS performance standard analysis has been removed from this chapter as explained in the preceding text.

Chapter 6: Alternatives

This chapter contains revisions to the Draft EIR (April 2019), as follows:

- The comparative evaluation of impacts related to GHG emissions/climate change and transportation/circulation have been revised to reflect the revised analysis provided in Section 5.7 and Section 5.14, respectively.

Chapter 7: Analysis of Long-Term Effects

This chapter contains revisions to the Draft EIR (April 2019), as follows:

- The evaluation of cumulative impacts related to GHG emissions/climate change and transportation/circulation have been revised to reflect the revised analysis provided in Section 5.7 and Section 5.14, respectively.

Chapter 8: References

This chapter contains revisions to the Draft EIR (April 2019), as follows:

- References to the previous air quality and GHG emissions analysis technical report and Marja Acres VMT Analysis were revised to reflect the updated or otherwise replaced technical reports.

Appendix B

This appendix was modified to replace the previous Air Quality and Greenhouse Gas Emissions Analysis Technical Report dated 2019 with the revised report dated 2020.

Appendix J

This appendix was modified to replace the previous traffic technical study titled, *Transportation Impact Analysis for the Marja Acres Project*. Linscott Law & Greenspan Engineers (LLG, 2019), with the traffic technical study titled, *Vehicle Miles Traveled Analysis Marja Acres*. Linscott Law & Greenspan Engineers (LLG, 2020).

All other chapters and sections of the draft EIR have not been revised and, therefore, are not included in this Recirculated Draft EIR.

1.5 Compliance with Governor's Executive Order N-54-20 related to CEQA Noticing

On April 22, 2020, California Governor Gavin Newsom issued Executive Order N-54-20 that found due to the COVID-19 pandemic and associated physical distancing protocols, it may be impossible or impracticable for lead agencies, responsible agencies, and project applicants to adhere to certain public filing and notice requirements under CEQA, the necessary physical distancing measures implemented to combat it have had widespread impacts on state and local governments, California Native American tribes, and on members of the public, making it impossible or impractical to adhere to certain statutory and regulatory deadlines, and so thereby ordered that:

- The public filing, posting, notice, and public access requirements set forth in Public Resources Code sections 21092.3 and 21152, and California Code of Regulations, Title 14, sections 15062(c)(2) and (c)(4); 15072(d); 15075(a), (d), and (e); 15087(d); and 15094(a), (d), and (e), for projects undergoing, or deemed exempt from, California Environmental Quality Act review, are suspended for a period of 60 days. This suspension does not apply to provisions governing the time for public review.
- In the event that any lead agency, responsible agency, or project applicant is operating under any of these suspensions, and the lead agency, responsible agency, or project applicant would otherwise have been required to publicly post or file materials concerning the project with any county clerk, or otherwise make such materials available to the public, the lead agency, responsible agency, or project applicant (as applicable) shall do all of the following:



- a. Post such materials on the relevant agency's or applicant's public-facing website for the same period of time that physical posting would otherwise be required;

As indicated under Section 1.3, the city has made available this Recirculated Draft EIR on the city's website for a minimum 45-day period.

- b. Submit all materials electronically to the State Clearinghouse CEQAnet Web Portal; and,
This Recirculated Draft EIR has been submitted electronically to the State Clearinghouse CEQAnet Web Portal.

- c. Engage in outreach to any individuals and entities known by the lead agency, responsible agency, or project applicant to be parties interested in the project in the manner contemplated by the Public Resources Code sections 21100 et seq and the California Code of Regulations, Title 14, sections 15000 et seq

The city has mailed directly to surrounding property owners, and those that provided written comments on the Draft EIR (April 2019) the Notice of Availability for this Recirculated Draft EIR.

- In addition to the foregoing, lead agencies, responsible agencies, and project applicants are also encouraged to pursue additional methods of public notice and outreach as appropriate for particular projects and communities.

The project applicant, New Urban West Communities, Inc. has engaged the surrounding properties owners and residences during the course of the entitlement processing for the project, including providing the status of the project review, and the availability of the Recirculated Draft EIR.

- The timeframes set forth in Public Resources Codes sections 21080.3.1 and 21082.3, within which a California Native American tribe must request consultation and the lead agency must begin the consultation process relating to an Environmental Impact Report, Negative Declaration, or Mitigated Negative Declaration under the California Quality Act, are suspended for a period of 60 days.

The city satisfied California Native American tribe consultation requirements for the proposed project as a component of preparation of the Draft EIR (April 2019).

In summary, during the 60-day suspension period, the executive order dispenses with the CEQA requirement that lead agencies, responsible agencies, or project proponents file CEQA notices for physical posting by the county clerk.

The executive order neither lengthens timelines for public review nor suspends noticing requirements altogether. Rather, the executive order temporarily suspends certain specific noticing requirements that rely upon public postings that may no longer be possible due to the closure of government buildings and social-distancing orders. Noticing otherwise required by CEQA through mail, email, publication, or posting at a project site is still required.

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This section is replicated from the Draft EIR (April 2019) for context of revisions. Table 2-1, Summary of Project Impacts and Proposed Mitigation Measures, and Table 2-3, Comparison of Alternative Impacts to the Proposed Project, have been updated to reflect revisions to Section 5.14 Traffic/Circulation. Changes are shown in ~~strikeout~~/underline. See pages 2-19 through 2-21 and page 2-32.

2 Executive Summary

2.1 Project Synopsis

2.1.1 Project Location

The project site is located in the Northwest Quadrant of the City of Carlsbad, in northern San Diego County. The City of Carlsbad is bordered to the north by the City of Oceanside, to the south by the City of Encinitas, to the east by the cities of Vista and San Marcos, and on the west by the Pacific Ocean. The project site is located approximately two miles east of the Pacific Ocean and 31 miles north of downtown San Diego. Regional access to the project site is provided by Interstate 5 (I-5) and State Route 78 (SR-78).

The proposed Marja Acres Project (proposed project) is located on two parcels (Assessor's Parcel Numbers [APN] 207-101-35 and 207-101-37) totaling 20.65 acres of land. The project site is located south of El Camino Real, east of Kelly Drive, north of Park Drive, and west of Lisa Street.

2.1.2 Existing Setting

The project site is currently improved with a small-scale commercial development accessed from El Camino Real, and one existing home, associated structures, and disturbed land that was utilized in the past for agriculture. The western portion of the project site is occupied by a commercial nursery.

The Robertson Ranch residential and commercial development is currently under construction across El Camino Real to the north of the project site. Existing single-family residential units are located to the west of the project site (along Kelly Drive), and to the south of the site (along Park Drive). A small mobile home park is located to the east of the project site.

The project site is located within California's Coastal Zone, defined as the area between the seaward limits of the state's jurisdiction and generally 1,000 yards landward from the mean high tide line. In Carlsbad, the coastal zone boundary generally encompasses the area east of the Pacific Ocean to El Camino Real. The city's Local Coastal Program (LCP), adopted in 1996, includes the city's land use plans, policies, and standards and an implementing ordinance (the Zoning Ordinance) for the city's Coastal Zone. The city's LCP includes six planning areas or segments that cover approximately one-third of the city. The project site is located within the Mello II Segment of the city's LCP, and is within the appellate jurisdiction of the California Coastal Commission (CCC).

Vegetation communities or land cover types identified on-site include ornamental/non-native vegetation, disturbed habitat, disturbed habitat/discarded land, and urban/developed land. The project site is subject to regular disturbance as a result of the existing and historic uses, which include a mix between previous (historic) agriculture and current commercial/retail uses. The disturbed land in the north, west, and southern portion, and urban/developed land in the north and western portion of the project site are all subject to regular human activity. The undeveloped portions of the project site have

been routinely disced. The developed portions of the project site currently are maintained for commercial/retail use.

2.1.3 Project Objectives

The project applicant has identified the following objectives for implementing the proposed project:

- Promote the construction of workforce housing near existing employment centers, infrastructure and public utilities.
- Provide a quality residential community of attached single-family homes attainably priced for young families and professionals.
- Provide low-income and very-low income age-restricted affordable housing to implement the *Carlsbad General Plan* and statewide housing goals.
- Redevelop and infill site identified in the city's Housing Element as underutilized with much-needed housing and neighborhood commercial uses.
- Design and implement a walkable mixed-use community that provides a balance of affordable and market rate housing connected to community gathering areas and commercial amenities.
- Create a new mixed-use community consistent with the goals and policies of the *Carlsbad General Plan* and LCP.
- Facilitate the establishment and operation of a community garden and vegetable stand to serve residents, as well as visitors to the proposed project's commercial and gathering spaces.
- Provide pedestrian-scale, economically viable neighborhood commercial uses that serve proposed project residents and visitors while also paying homage to past uses and structures on the site.
- Provide neighborhood recreational and open space amenities that will induce residents to minimize travel, resulting in a reduction of GHG emissions.
- Design a community that encourages social interaction by integrating land use types and mobility within the community.
- Utilize context sensitive grading techniques and proposed project design features to ensure compatibility with adjacent residential land uses.

2.1.4 Project Characteristics

The proposed project includes a total of 296 dwelling units consisting of 237 townhomes within the R-15 General Plan designated area, and 46 age-restricted affordable apartment units, 13 townhomes, a 4,000-square-foot restaurant pad and a 6,000-square-foot retail pad area within the General Commercial General Plan designated area.

The proposed project would utilize the opportunities provided by the Residential Density Bonus and Incentives or Concession section of the Carlsbad Zoning ordinance (Carlsbad Municipal Code [CMC] Chapter 21.86). This allows up to a 35 percent increase in the number of units beyond the maximum General Plan density calculations. CMC Chapter 21.86 is fully intended to implement the Housing Element of the *Carlsbad General Plan* and provide additional affordable housing for lower- and moderate-income households.

2.1.5 Discretionary Actions and Other Approvals Associated with the Proposed Project

In conformance with Sections 15050 and 15367 of the State CEQA Guidelines, the city has been designated as the “lead agency,” which is defined as, “the public agency which has the principal responsibility for carrying out or approving a project.” The following identifies the discretionary actions and approvals by the city for the proposed project.

- **Tentative Map (CT 16-07).** The Applicant is requesting approval of a Tentative Tract Map required for development of the proposed project site. A tentative tract map is required by the California Subdivision Map Act (Government Code §66426 et seq.)
- **Planned Development Permit – Residential (PUD 16-09).** The Applicant is requesting a planned development permit (PUD) to facilitate individual ownership of units and subdivision of the residential areas.
- **Planned Development Permit - Nonresidential (PUD 2018-0007).** The Applicant is requesting a nonresidential PUD to facilitate individual ownership of commercial and age-restricted lots, and mixed-use-residential units along with subdivision of the commercial site.
- **Site Development Plan (SDP 2018-0001).** A site development plan (SDP) is required for the age-restricted affordable housing component of the project and for the proposed residential uses located with the General Commercial zone.
- **Coastal Development Permit (CDP 16-33).** A Coastal Development Permit (CDP) is required to construct the proposed project. This permit is necessary as the project site is located in the Coastal Zone within the Mello II Segment of the LCP, and is within the appellate jurisdiction of the CCC.
- **Hillside Development Permit (HDP 16-02).** Grading of the proposed project site is subject to the city’s Hillside Development Ordinance as project areas contain hillside conditions that are defined as slopes greater than 15 feet in height and 15 percent in slope. The purpose of the Hillside Development Permit (HDP) is to regulate grading per the city’s Hillside Development Ordinance (Municipal Code Chapter 21.95) standards and policies.
- **Special Use Permit (16-02).** The project site is located along El Camino Real within the Scenic Preservation Overlay and is subject to the El Camino Real Corridor Development Standards. Thus, a Special Use Permit (SUP) is required for the proposed project.
- **Final EIR Certification (EIR 2017-0001).** After the required public review of the Draft EIR, the city will respond to comments, edit the document, and produce a final EIR to be certified by the city decision-maker as complete and providing accurate information concerning the potential environmental impacts of the proposed project.

2.1.6 Discretionary Actions and Approvals by Other Agencies

The project site supports a low-quality drainage ditch that could qualify as non-wetland waters of the U.S. (WOUS) subject to U.S. Army Corps of Engineers (USACE) jurisdiction pursuant to Clean Water Act (CWA) Section 404, non-wetland waters of the state subject to Regional Water Quality Control Board (RWQCB) jurisdiction pursuant to CWA Section 401, and unvegetated streambed subject to California Department of Fish and Wildlife (CDFW) jurisdiction pursuant to California Fish and Game Code Sections 1600 et seq. The proposed project will require the following agency notifications and permits:

- **USACE** - The project applicant shall prepare and submit notification to the USACE for unavoidable impacts on non-wetland WOUS. Based on the USACE's CWA Section 404 Nationwide Permit (NWP) program, project activities would be covered under NWP 29 – Residential Developments, contingent upon waiver of the 300 linear feet limit for this permit.
- **RWQCB** - The project applicant shall prepare and submit a CWA Section 401 Request for Water Quality Certification to the RWQCB for unavoidable impacts on non-wetland waters of the state.
- **CDFW** - The project applicant shall prepare and submit a California Fish and Game Code Section 1602 Notification of Lake or Streambed Alteration to the CDFW for unavoidable impacts on unvegetated jurisdictional streambed.

2.2 Summary of Significant Impacts and Mitigation Measures that Reduce or Avoid the Significant Impacts

Table 2-1 summarizes environmental impacts, mitigation measures, and level of significance after mitigation associated with the proposed project. Detailed analyses of these topics are included within each corresponding section contained within this document.

Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
<i>Aesthetics/Grading</i>			
No significant aesthetic impacts were identified.	Less than significant	No mitigation measures required.	N/A
<i>Agriculture and Forestry Resources</i>			
No significant impacts on agricultural and forestry resources were identified.	No impact	No mitigation measures required.	N/A
<i>Air Quality</i>			
No significant impacts on air quality were identified.	Less than significant	No mitigation measures required.	N/A
<i>Biological Resources</i>			
Construction of the proposed project could result in the removal or trimming of trees and other vegetation during the general bird nesting season (January 15 through September 15) and, therefore, could result in impacts on nesting birds and violation of the Migratory Bird Treaty Act and California Fish and Game Code.	Significant	BIO-1 Nesting Bird and Raptor Avoidance. If initial grading and vegetation removal activities (i.e., earthwork, clearing, and grubbing) must occur during the general bird breeding season for migratory birds and raptors (January 15 and September 15), the project applicant shall retain a qualified biologist to perform a preconstruction survey of potential nesting habitat to confirm the absence of active nests belonging to migratory birds and raptors afforded protection under the MBTA and California FGC. The preconstruction survey shall be performed no more than 7 days prior to the commencement of grading and/or vegetation removal activities. If the qualified biologist determines no active migratory bird or raptor nests occur, the activities shall be allowed to proceed without any further requirements. Should an active nest of any MBTA-covered species occur within or adjacent to the project impact area, a 100-foot buffer (300 feet for raptors) shall be established around the nest, and no construction shall occur within this area until a qualified biologist determines the nest is no longer active or the young have fledged.	Less than significant

Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
Project development would impact common upland habitat types (Carlsbad HMP Habitat Group F) that are not sensitive natural communities. Impacts on non-sensitive upland habitat types require purchase of in-lieu fee credits under the HMP.	Significant	BIO-2 Habitat Management Plan In-Lieu Mitigation Fee. Prior to recordation of a final map or issuance of a grading permit, whichever occurs first, the project applicant shall pay habitat in-lieu mitigation fees according to the ratios and amounts established by the Habitat Management Plan for Natural Communities in the City of Carlsbad.	Less than significant
Potential significant indirect impacts could occur if stormwater runoff is not controlled at the construction site, and sediment, toxics, and/or other material is inadvertently carried into sensitive habitat within the adjacent off-site Kelly Creek. Further, if the construction work areas are not properly fenced, inadvertent encroachment into adjacent sensitive riparian habitat associated with Kelly Creek could occur.	Significant	<p>The following mitigation measure, in addition to Mitigation Measures WQ-1 and WQ-2 (described below under Hydrology/Water Quality) would reduce indirect impacts on biological resources.</p> <p>BIO-3 Construction Fencing. The applicant shall show the locations of temporary construction fencing with the first submittal of grading plans. Temporary construction fencing (with silt barriers) shall be installed at the limits of project impacts (including construction staging areas and access routes) adjacent to sensitive habitat to prevent sensitive habitat impacts and the spread of silt from the construction zone into adjacent habitats. Fencing may be required at the western end of the project to separate project impacts from the off-site sensitive habitat of Kelly Creek. Fencing shall be installed in a manner that does not impact habitats to be avoided. The applicant shall submit to the City of Carlsbad for approval at least 30 days prior to grading permit issuance, the final plans for project construction. These final plans shall include photographs that show the fenced limits of impact and areas to be impacted or avoided.</p> <p>Employees shall strictly limit their activities, vehicles, equipment, and construction materials to the fenced project footprint. All equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other such activities shall occur in designated areas within the fenced project impact limits. These designated areas shall be located in previously compacted and disturbed areas to the maximum extent practicable in such a manner to prevent any runoff from entering adjacent open space and shall be shown on the construction plans. Fueling of equipment shall take place within existing disturbed areas greater than 100 feet from Kelly Creek. Contractor equipment shall be checked for leaks prior to operation</p>	Less than significant

Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
		<p>and repair, as necessary. “No-fueling zones” shall be designated on construction plans.</p> <p>If work occurs beyond the fenced or demarcated limits of impact, all work shall cease until the problem has been remedied to the city’s satisfaction. Any impacts that occur to environmentally sensitive areas beyond the approved fence shall be mitigated in accordance with ratios specified in the Carlsbad HMP or as otherwise determined by the City of Carlsbad in coordination with the USFWS, USACE, RWQCB, and/or CDFW. Temporary construction fencing shall be removed upon project completion.</p>	
<p>The project site supports a low-quality drainage ditch that could qualify as non-wetland WOUS subject to USACE jurisdiction pursuant to CWA Section 404, non-wetland waters of the state subject to RWQCB jurisdiction pursuant to CWA Section 401, and unvegetated streambed subject to CDFW jurisdiction pursuant to California FGC Sections 1600 et seq.</p>	Significant	<p>BIO-4 Regulatory Permitting and Compensatory Mitigation. Impacts on all or portions of the unnamed drainage ditch on the project site shall require the following agency notifications and permits prior to approval of the final map:</p> <ul style="list-style-type: none"> • The project applicant shall prepare and submit notification to the USACE for unavoidable impacts on non-wetland WOUS. Based on the USACE’s CWA Section 404 NWP program, project activities would be covered under NWP 29 – Residential Developments, contingent upon waiver of the 300 linear feet limit for this permit. • The project applicant shall prepare and submit a CWA Section 401 Request for Water Quality Certification to the RWQCB for unavoidable impacts on non-wetland waters of the state. • The project applicant shall prepare and submit a California FGC Section 1602 Notification of Lake or Streambed Alteration to the CDFW for unavoidable impacts on unvegetated jurisdictional streambed. <p>If required by the USACE, RWQCB, and/or CDFW in regulatory permits, the project applicant shall implement compensatory mitigation at a minimum ratio of 1:1 for the unavoidable loss of jurisdictional waters, which would include one or a combination of the following measures:</p> <ul style="list-style-type: none"> • The project applicant shall purchase preservation, establishment/ re-establishment, rehabilitation, and/or enhancement credits from a mitigation bank approved by the USACE, RWQCB, and/or CDFW; and/or, 	Less than significant

Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
		<ul style="list-style-type: none"> The project applicant shall implement permittee-responsible preservation, establishment, re-establishment, rehabilitation and/or enhancement at an on- or off-site location approved by the USACE, RWQCB, and/or CDFW, including preparation and implementation of a conceptual mitigation plan, habitat mitigation monitoring plan, restoration plan, and/or long-term management plan, unless otherwise specified by the USACE, RWQCB, and/or CDFW. A conservation easement, restrictive covenant, or other protection shall be recorded over the mitigation area, and the area shall be managed in perpetuity in accordance with the long-term management plan, unless otherwise specified by the USACE, RWQCB, and/or CDFW. 	
Project operation has the potential to result in significant indirect impacts on wildlife potentially using off-site habitat associated with Kelly Creek if lighting is not appropriately shielded and directed downward and away.	Significant	BIO-5 Project Lighting. Prior to issuance of a grading permit or building permit, whichever is applicable for the particular lighting, the applicant shall submit an exterior lighting plan for City Planner approval. All exterior lighting adjacent to off-site habitat associated with Kelly Creek to the west shall be limited to low pressure sodium or alternative sources in the amber spectrum of the lowest illumination allowed for human safety, selectively placed, shielded, and directed away from habitat to the maximum extent practicable.	Less than significant
Cultural Resources			
Because of the presence of significant archaeological sites located within 500 feet of the project site boundaries, there is the potential that previously undiscovered archaeological resources could be encountered during grading activities.	Significant	CR-1 The following shall be implemented to minimize impacts on subsurface cultural resources: <ul style="list-style-type: none"> Prior to the commencement of ground-disturbing activities, the project developer shall contract with a qualified professional archaeologist and enter into a pre-excavation agreement, otherwise known as a Cultural Resources Treatment and Tribal Monitoring Agreement, with the San Luis Rey Band of Mission Indians or other Luiseño tribe, for monitoring during ground-disturbing activities. The agreement will contain provisions to address the proper treatment of any tribal cultural resources and/or Luiseño Native American human remains inadvertently discovered during the course of the project. The agreement will outline the roles and powers of the Luiseño Native American monitors and the archaeologist and shall include the provisions below. In some cases, the language below may be modified in consultation with the tribe if special conditions warrant. A copy of said archaeological contract and 	Less than significant

Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
		<p>Tribal Monitoring agreement shall be provided to the City of Carlsbad prior to the issuance of a grading permit.</p> <ul style="list-style-type: none"> • A Luiseño Native American monitor shall be present during all ground-disturbing activities. Ground-disturbing activities may include, but are not limited to, archaeological studies, geotechnical investigations, clearing, grubbing, trenching, excavation, preparation for utilities and other infrastructure, and grading activities. • Any and all uncovered artifacts of Luiseño Native American cultural importance shall be repatriated to the Native American tribes, San Luis Rey Band of Mission Indians and Rincon Band of Luiseño Indians, that consulted with the city per AB 52 ("consulting tribes") for reburial within an appropriate protected location determined in consultation with the tribes and protected by open space or easement, etc., where the cultural items will not be disturbed in the future, and shall not be curated unless ordered to do so by a federal agency or a court of competent jurisdiction. • The archaeologist and Luiseño Native American monitor shall be present at the project's on-site preconstruction meeting to consult with grading and excavation contractors concerning excavation schedules and safety issues, as well as consult with the principal archaeologist concerning the proposed archaeologist techniques and/or strategies for the project. • Luiseño Native American monitors and archaeological monitors shall have joint authority to temporarily divert and/or halt construction activities. If tribal cultural resources are discovered during construction, all earth-moving activity within and 100 feet around the immediate discovery area must be diverted until the Luiseño Native American monitor and the archaeologist can assess the nature and significance of the find. • If a significant tribal cultural resource(s) and/or unique archaeological resource(s) are discovered during ground-disturbing activities for the project, the consulting tribes shall be notified and consulted regarding the respectful and dignified treatment of those resources. Pursuant to California PRC Section 21083.2(b) avoidance is the preferred method of preservation for archaeological and tribal cultural resources. If, however, the Applicant is able to demonstrate that avoidance 	

Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
		<p>of a significant and/or unique cultural resource is infeasible and a data recovery plan is authorized by the City of Carlsbad as the lead agency, the consulting tribes shall be consulted regarding the drafting and finalization of any such recovery plan.</p> <ul style="list-style-type: none"> • When tribal cultural resources are discovered during the project, if the archaeologist collects such resources, a Luiseño Native American monitor must be present during any testing or cataloging of those resources. All collections made by archaeologists will be collected and treated following the guidelines and regulations set forth under 36 CFR 79, federal regulations for collection of cultural materials. If the archaeologist does not collect the tribal cultural resources that are unearthed during the ground-disturbing activities, the Luiseño Native American monitor may, in their discretion, collect said resources and repatriate them to the consulting tribes for dignified and respectful treatment in accordance with their cultural and spiritual traditions. • If suspected Native American human remains are encountered, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the San Diego County Medical Examiner has made the necessary findings as to origin. Further, pursuant to California PRC Section 5097.98(b) remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. Suspected Native American remains shall be examined in the field and kept in a secure location at the site. A Luiseño Native American monitor shall be present during the examination of the remains. If the San Diego County Medical Examiner determines the remains to be Native American, the Medical Examiner must contact the NAHC within 24 hours. The NAHC must then immediately notify the MLD upon receiving notification of the discovery. The MLD shall then make recommendations within 48 hours of being granted access to the site and engage in consultation concerning treatment of remains as provided in PRC 5097.98. • In the event that fill material is imported into the project area, the fill shall be clean of tribal cultural resources and documented as such. Commercial sources of fill material are already permitted as appropriate and will be culturally sterile. If 	

Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
		<p>fill material is to be utilized and/or exported from areas within the project site, then that fill material shall be analyzed and confirmed by an archaeologist and Luiseño Native American monitor that such fill material does not contain tribal cultural resources.</p> <ul style="list-style-type: none"> No testing, invasive or noninvasive, shall be permitted on any recovered tribal cultural resources without the written permission of the consulting tribes. Prior to the release of the grading bond, a monitoring report and/or evaluation report, if appropriate, which describes the results, analysis, and conclusions of the monitoring program shall be submitted by the archaeologist, along with the Luiseño Native American monitor's notes and comments, to the City of Carlsbad for approval. Said report shall be subject to confidentiality as an exception to the Public Records Act and will not be available for public distribution. 	
Implementation of the proposed project would result in a potentially significant paleontological resource impact in association with grading/excavation in previously undisturbed areas of the Santiago Formation (high sensitivity).	Significant	<p>CR-2 Prior to the issuance of a grading permit, the project applicant shall enter into a contract with a qualified Principal Paleontologist to monitor the site, and provide a copy of the contract to the City of Carlsbad. The paleontologist shall be present at the project's on-site preconstruction meeting to consult with grading and excavation contractors concerning excavation schedules, safety issues and procedures, and shall monitor all grading that includes initial cutting into any area of the project site, as the project site sits on paleontologically-sensitive Santiago Formation deposit. If any paleontological resources are identified during these activities, the paleontologist shall temporarily divert construction until the significance of the resources is ascertained.</p> <p>CR-3 Paleontological monitoring shall occur only for those undisturbed sediments wherein fossil plant or animal remains are found with no associated evidence of human activity or any archaeological context.</p> <p>CR-4 Paleontological monitors shall be equipped to salvage fossils as they are unearthed to avoid construction delays and remove samples of sediments, which are likely to contain the remains of small fossil invertebrates and vertebrates. Monitors shall be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens. Monitoring may be reduced if the</p>	Less than significant

Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
		<p>potentially fossiliferous units described above are not present or if the fossiliferous units present are determined by a qualified paleontological monitor to have low potential to contain fossil resources.</p> <p>CR-5 All recovered specimens shall be prepared to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates.</p> <p>CR-6 Specimens shall be identified and curated into an established, accredited, professional museum repository with permanent retrievable storage, such as the San Diego Natural History Museum. The paleontologist shall have a written repository agreement in hand prior to the issuance of a grading permit and initiation of mitigation activities.</p> <p>CR-7 Prior to the release of grading bonds, the paleontologist shall complete a report describing the methods and results of the paleontological monitoring and data recovery program, and file a copy of the report at the San Diego Natural History Museum.</p>	

Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
Potential impacts on subsurface human remains resulting from construction of the proposed project may occur during excavation and grading.	Significant	<p>CR-8 If human remains or remains that are potentially human are found during any ground disturbance associated with project development activities, including the archaeological test or data recovery programs, the project proponent and its agents must comply with PRC 5097.98 and California Health and Safety Code 7050.5.</p> <ul style="list-style-type: none"> a) The archaeologist in consultation with the Native American monitor(s) shall ensure reasonable measures are taken so that the discovery location will be protected and secured from further disturbance. b) The archaeological project manager shall notify the County Medical Examiner. c) If the remains are determined by the medical examiner or an authorized representative to be Native American, the medical examiner will notify the NAHC. d) The NAHC will designate and contact the MLD. e) The property owner will provide the MLD with access to the discovery location, which will have been protected from damage. f) The MLD will make a recommendation for treatment of the remains within 48 hours of being granted access to the property. The descendant's preferences for treatment may include the following: <ul style="list-style-type: none"> i) The nondestructive removal and analysis of human remains and items associated with Native American human remains. ii) Preservation of Native American human remains and associated items in place. iii) Relinquishment of Native American human remains and associated items to the descendants for treatment. iv) Other culturally appropriate treatment. g) If the MLD does not make a recommendation within 48 hours, or if the recommendations are not acceptable to the property owner following extended discussions and mediation by the NAHC, the property owner will reinter the remains and burial items with appropriate dignity on the property, in a location not subject to further subsurface disturbance. The location of reinterment will be protected by at least one of the three following measures: 	Less than significant

Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
		<ul style="list-style-type: none"> i) Record the location with the NAHC or the SCIC. ii) Utilize an open space or conservation zoning designation or easement. iii) Record a reinternment document with San Diego County. h) If multiple human remains are found, extended discussions will be held with the MLD. If agreement on the treatment of these remains is not reached, they will be reinterred in compliance with PRC 5097.98(e). i) If Native American remains are discovered during ground disturbance and are positively identified as such by a representative of the county medical examiner, they will be kept in situ, or in a secure location in close proximity to where they were found, and free from disturbance until a final decision as to treatment and disposition has been made. Any analysis of the remains will occur only on site in the presence of a Luiseño Native American monitor. 	
There are TCRs within a .5-mile radius of the project area. Therefore, there is a reasonable possibility that TCRs may be encountered during the project's ground-disturbing activities. If TCRs are encountered, the proposed project may result in potentially significant impacts on TCRs.	Significant	Mitigation Measures CR-1 and CR-8 (as identified above)	Less than Significant



Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
Geology/Soils			
The project site may be prone to liquefaction, landslides, unstable geologic units, and expansive soils. Therefore, the proposed project has a potential to result in a significant geology/soils impact.	Significant	GEO-1 Prior to approval of final engineering and grading plans for the project, the city's Land Development Engineering Department shall verify that all recommendations contained in the <i>Update of the Geotechnical Update Evaluation for Marja Acres</i> (GeoSoils 2018) have been incorporated into all final engineering and grading plans. The city's soil engineer and engineering geologist shall review grading plans prior to finalization to verify plan compliance with the recommendations of the report. All future grading and construction of the project site shall comply with the geotechnical recommendations contained in the geotechnical report. The report identifies specific measures for mitigating geotechnical conditions on the project site and addresses grading, slope stability, foundations, concrete slabs-on-grade, and retaining walls.	Less than significant
Greenhouse Gas Emissions/Climate Change			
No significant impacts on greenhouse gas emissions/climate change were identified.	Less than significant	No mitigation measures are required.	N/A
Hazards and Hazardous Materials			
Given the age of the existing structures on the project site (constructed circa 1950), ACMs and LBP are likely to be present at the project site. The potential presence of ACMs and LBP on the project site is a significant impact on the public and environment, specifically when existing structures are demolished as part of the proposed project.	Significant	HAZ-1 Hazardous Materials Assessment. Prior to the issuance of a demolition permit for the existing buildings, a Hazardous Materials Assessment (surveys) would be performed to determine the presence or absence of ACMs/LBP located in the buildings to be demolished. Suspect materials that would be disturbed by the demolition activities would be sampled and analyzed for asbestos content, or assumed to be asbestos containing. All lead containing materials and ACMs scheduled for demolition must comply with applicable regulations for demolition methods and dust suppression. Lead containing materials and ACMs shall be managed in accordance with applicable regulations. The ACM survey would be conducted by a person certified by the California Division of Occupational Safety and Health. The LBP survey would be conducted by a person certified by the California Department of Health Services. Copies of the surveys would be provided to the	Less than significant

Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
		County of San Diego Department of Environmental Health and San Diego Air Pollution Control District once completed.	
Hydrology and Water Quality			
Potential water quality impacts associated with short-term construction activities could result from grading and excavation. These activities could result in potential erosion/sedimentation and discharge of construction-related hazardous materials (e.g., fuels, grease, etc.) into local storm drains.	Significant	WQ-1 Prior to issuance of a grading permit for any phase of the development, the applicant shall prepare and submit for review and approval of the Carlsbad City Engineer, a SWPPP to demonstrate that pollutants will be controlled through compliance with the City of Carlsbad Stormwater Management and Discharge Control Ordinance, General Construction Stormwater Permit (Order No. 2012-0006-DWQ, NPDES CAS000002), and the General Municipal Stormwater Permit (R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100, NPDES No. CAS0109266). The applicant shall be responsible for monitoring and maintaining the BMP erosion control measures identified below on a weekly basis in accordance with the city's grading and erosion control requirements (Municipal Code Section 15.16. et seq.). The locations of all erosion control devices shall be noted in the SWPPP referenced on the grading plans. BMPs that shall be installed include, but are not limited to, the following: <ul style="list-style-type: none"> • Silt fence, fiber rolls, or gravel bag berms • Street sweeping and vacuuming • Storm drain inlet protection • Stabilized construction entrance/exit • Hydroseed, soil binders, or straw mulch • Containment of material delivery and storage areas • Stockpile management • Spill prevention and control • Waste management for solid, liquid, hazardous, and sanitary waste-contaminated soil • Concrete waste management 	Less than significant
Once constructed, the proposed project would likely generate certain pollutants commonly found in similar developments that could affect water quality downstream from the project	Significant	WQ-2 Prior to the issuance of grading permits or other approvals for any public or private right-of-way improvements, the developer shall prepare and submit for review and approval of the Carlsbad City Engineer, SWQMP, grading and improvement plans that demonstrate that pollutants will be controlled through compliance with the City of Carlsbad BMP Design Manual. Approval of such plans shall be subject to a determination by the Carlsbad City	Less than significant

Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
site. With the inclusion of the proposed uses, the proposed project has the potential to result in long-term impacts on water quality due to the addition of pollutants typical or urban runoff.		Engineer that the proposed project has implemented an integrated LID approach to meet criteria described in the City of Carlsbad BMP Design Manual. The proposed project has incorporated LID strategies which include site design BMPs, source control BMPs and pollutant control BMPs into the project design to the maximum extent practicable.	
Land Use Planning			
The project site is located within the ALUCP's Airport Overflight Notification Area and Review Area 2 of the AIA. The ALUCP requires that all new residential projects located within the overflight notification area be required to record a notice informing residents of the potential environmental impacts related to the aircraft, and the property is subject to overflight, sight, and sound of aircraft operating from the McClellan-Palomar Airport.	Significant	<p>LU-1 New residents within the McClellan-Palomar Airport Overflight Notification Area as defined by the ALUCP shall be notified as part of the real estate disclosure package that the project site is outside the 60 dB(A) CNEL airport noise impact area, but still subject to intermittent single-event noise impacts, sight, and sound of aircraft operating from McClellan-Palomar Airport. The state statute dictates that the following statement shall be provided:</p> <p>NOTICE OF AIRPORT IN VICINITY: This property is presently located in the vicinity of an airport, within what is known as an airport influence area. For that reason, the property may be subject to some of the annoyances or inconveniences associated with proximity to airport operations (for example: noise, vibration, or odors). Individual sensitivities to those annoyances can vary from person to person. You may wish to consider what airport annoyances, if any, are associated with the property before you complete your purchase and determine whether they are acceptable to you.</p> <p>This measure shall be implemented concurrent with the real estate disclosure package. Prior to issuance of building permits, the City of Carlsbad Planning Division shall be responsible for verification of implementation of this measure through the recordation of a Notice.</p>	Less than significant
Noise			
At the age-restricted affordable apartments units and townhome façade locations, exterior noise levels would generally exceed the	Significant	<p>NOI-1 Prior to issuance of building permits for any residential buildings with usable outdoor patio or balcony areas with a direct, unobstructed view of El Camino Real, a noise barrier with heights ranging from 5 to 8 feet as shown on Figure 5: Noise Barrier Heights Necessary to Achieve Exterior Noise Standards Figure</p>	Less than significant

Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
applicable city noise standards for exterior use areas along the first, second and third rows with an unobstructed exposure to El Camino Real.		5.11-3 of this EIR) of the <i>Noise Technical Report for the Marja Acres Community Plan</i> (Dudek 2018), shall be incorporated into the building/architectural plans to mitigate noise impacts. The noise barriers may be constructed of a material such as tempered glass, acrylic glass (or similar material), masonry material, or manufactured lumber (or a combination of these), with a surface density of at least 3 pounds per square foot. The noise barriers shall have no openings, gaps, or cracks, and shall be installed prior to issuance of a certificate of occupancy.	
Future noise levels would range up to 71 dBA CNEL at the north- and northeast-facing sides of the age-restricted affordable apartment units and townhomes with a view of El Camino Real. Thus, the unmitigated interior noise level within the habitable rooms of these locations would exceed the 45 dBA CNEL noise criterion.	Significant	NOI-2 Prior to issuance of building permits for the residential units identified on Figure 6: Units Requiring Subsequent Interior Noise Analysis (Figure 5.11-4 of this EIR) of the <i>Noise Technical Report for the Marja Acres Community Plan</i> (Dudek 2018), a site specific noise study will be required to ensure that the outside noise levels are below 60 dBA CNEL and interior noise levels are below 45 dBA CNEL. Any additional measures identified by the acoustical analysis that are necessary to achieve an interior standard of 45 dBA CNEL shall be incorporated into the building/architectural plans. The buildings will require air-conditioning and/or mechanical ventilation and possibly sound-rated windows to mitigate the interior noise impact.	Less than significant

Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
The HVAC noise levels have the potential to exceed the City of Carlsbad noise standard for stationary source noise at residential uses (55 dBA Leq from 7 a.m. to 10 p.m., 45 dBA Leq from 10 p.m. to 7 a.m.) at the nearest existing noise-sensitive receivers.	Significant	NOI-3 The project applicant shall retain an acoustical specialist to review project construction-level plans to ensure that the equipment specifications and plans for HVAC and other outdoor mechanical equipment incorporate measures, such as the specification of quieter equipment or provision of acoustical enclosures, that will not exceed relevant noise standards at nearby noise-sensitive land uses (e.g., residential). Prior to issuance of building permits, the acoustical specialist shall certify in writing to the City of Carlsbad that the equipment specifications and plans incorporate measures that will achieve the relevant noise limits.	Less than significant
The proposed rooftop decks that would be located in the southeastern corner of the project on Unit 222L and Unit 223L would not be set back from the edge of the buildings facing south and east. Thus, unless noise mitigation is provided, the noise level at the southeasterly property line would exceed 50 dBA Leq.	Significant	NOI-4 Prior to issuance of building permits for residential units 222L and 223L, 5-foot noise barriers along the northern, southern, and eastern sides of the rooftop decks as shown on Figure 7: Rooftop Deck Locations (Figure 5.11-5 of this EIR) of the <i>Noise Technical Report for the Marja Acres Community Plan</i> (Dudek 2018) shall be incorporated into the building/architectural plans to mitigate noise impacts as a result of rooftop activity to adjacent residential uses. The noise barriers may be constructed of a material such as tempered glass, acrylic glass (or similar material), masonry material, or manufactured lumber (or a combination of these), with a surface density of at least 3 pounds per square foot. The noise barriers shall have no openings, gaps, or cracks, and shall be installed prior to issuance of a certificate of occupancy.	Less than significant
Population/Housing			
No significant impacts on population/housing were identified.	Less than significant	No mitigation measures are required.	N/A
Public Services			
No significant impacts on public services were identified.	Less than significant	No mitigation measures are required.	N/A
Transportation/Circulation			
No significant impacts on transportation/circulation were identified.	Less than significant Significant	No mitigation measures are required. T-1 Prior to issuance of a certificate of occupancy for the first market-rate unit, the project applicant shall provide evidence to the	N/A. Less than significant

Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
<p>The results of the Project VMT comparison indicate that the Project would exceed the significance threshold by 7.54%.</p>		<p>City of Carlsbad's Community Development Department that it will implement measure CAPCOA TRT-3: Provide Ride Sharing Programs. To satisfy this requirement, the project will provide a ride-sharing program, which will be available to all residents, that promotes ride-sharing through a multi-faceted approach, including but not limited to:</p> <ul style="list-style-type: none"> • Provide a web site or message board for coordinating rides. • Assist residents with matching commutes with ridesharing opportunities. • Promote rideshare/carpool programs. • Promote the use of any carpool platforms or applications utilized by the Citywide Transportation Demand Management program, such as RideAmigos, or equivalent. <p>The project applicant will fund the first three years of this mitigation measure, which amounts to a total of \$62,640 (\$20,880/year), prior to issuance of a certificate of occupancy for the first market-rate unit, and the project's homeowners association will then assess new residents to fund the subsidy program in perpetuity upon issuance of the final certificate of occupancy for the 250th market-rate unit.</p> <p>The project's Transportation Coordinator, appointed by the homeowners' association, shall oversee the ride sharing program and provide updates on the implementation and funding status of this measure to the City of Carlsbad's Community Development Department consistent with the provisions of Section 2.8 of the Carlsbad TDM Handbook.</p> <p>T-2 Prior to issuance of a certificate of occupancy for the first market-rate unit, the project applicant shall provide evidence to the City of Carlsbad's Community Development Department that it will implement measure CAPCOA TRT-4: Implement Subsidized or Discounted Transit Program. To satisfy this requirement, the project will provide subsidized/discounted monthly public transit passes, which will be available to all residents.</p> <p>The project applicant will fund the first three years of this mitigation measure, which amounts to a total of \$136,890 (\$45,630/year), prior to issuance of a certificate of occupancy for the first market-rate unit, and the project's homeowners association will then assess new residents to fund the subsidy program in perpetuity upon issuance of the final certificate of occupancy for the 250th market-rate unit.</p>	



Table 2-1. Summary of Project Impacts and Proposed Mitigation Measures

Environmental Impact	Significance Before Mitigation	Proposed Mitigation Measures	Significance After Mitigation
		<p><u>The project's Transportation Coordinator, appointed by the homeowners' association, shall oversee the transit subsidy program and provide updates on the implementation and funding status of this measure to the City of Carlsbad's Community Development Department consistent with the provisions of Section 2.8 of the Carlsbad TDM Handbook.</u></p> <p>T-3 <u>Prior to issuance of a certificate of occupancy for the first market-rate unit, the project applicant shall provide evidence to the City of Carlsbad's Community Development Department that it will implement measure CAPCOA TRT-7: Implement Commute Trip Reduction Marketing. To satisfy this requirement, the project will promote and advertise transportation options available to new and existing residents. Marketing strategies may include, but not be limited to:</u></p> <ul style="list-style-type: none"> <u>• Providing a website maintained by the HOA.</u> <u>• Monthly email newsletter blasts.</u> <u>• Promotional materials available in common areas.</u> <u>• Information packets accompanying HOA documents for new residents.</u> 	
<i>Utilities and Services Systems</i>			
No significant impacts on utilities and service systems were identified.	Less than significant	No mitigation measures are required.	N/A

2.3 Areas of Controversy and Issues to be Resolved

2.3.1 Areas of Controversy

Section 15123(b)(2) of the CEQA Guidelines requires that an EIR identify areas of controversy known to the Lead Agency, including issues raised by other agencies and the public. The main comments submitted on the NOP during the public review and comment period are summarized in Table 2-2.

Table 2-2. Summary of Notice of Preparation Comments

Environmental Issue Area	Issues Raised
Visual/Aesthetics	<ul style="list-style-type: none"> • Lighting impacts • Impacts on surrounding natural views • Fencing and barriers
Air Quality	<ul style="list-style-type: none"> • Air pollution from construction • Increased traffic air pollution
Biology Resources	<ul style="list-style-type: none"> • Impacts on potential sensitive species • Impacts on potential hawks and other birds in the project area • Impacts on open space and natural surroundings (lagoon and wetlands)
Cultural Resources	<ul style="list-style-type: none"> • Impacts on potential cultural, tribal, and/or paleontological resources
Hazards and Hazardous Materials	<ul style="list-style-type: none"> • Concerns regarding hazardous materials potentially present due to historic agricultural use of project site • Construction runoff contaminated with pesticides
Hydrology	<ul style="list-style-type: none"> • Concerns regarding proper drainage of re-contoured land • Contamination of lagoon because of increased surface runoff
Land Use/Planning	<ul style="list-style-type: none"> • Scale of development • Compatibility with adjacent uses
Noise	<ul style="list-style-type: none"> • Noise from new vehicular traffic • Construction noise
Population/Housing	<ul style="list-style-type: none"> • Density of proposed development • Increase in population • Increase in elementary school children
Recreation	<ul style="list-style-type: none"> • Increase in recreational area usage
Traffic	<ul style="list-style-type: none"> • Increase in traffic due to increased population • Consider multimodal mobility • Impacts on emergency providers as a result of congested traffic • Parking
Utilities	<ul style="list-style-type: none"> • Water supply

2.3.2 Issues to be Resolved

The CEQA Guidelines Section 15123(b)(3) also requires a discussion of issues to be resolved including a choice of alternatives and whether or how to mitigate the significant effects. Based on all information included in the Record of Proceedings, the city decision-maker must decide whether or not the EIR was prepared in compliance with CEQA (PRC 21000, et. seq.) and Guidelines for Implementation of CEQA (California Code of Regulations [CCR] Section 15000, et seq.). If deemed

compliant with CEQA, the city decision-maker shall certify the EIR and consider whether to approve the proposed project or one of the project alternatives. Furthermore, the city decision-maker must decide if the proposed mitigation is adequate and choose whether or how to mitigate any significant impacts. Alternatives to the proposed project have also been identified that would reduce or avoid the potentially significant impacts associated with the proposed project. The city decision-maker would need to decide to approve one of the alternatives discussed in this EIR instead or approve the proposed project.

2.4 Project Alternatives

The environmental analysis for the proposed project evaluated the potential environmental impacts resulting from implementation of the proposed project, as well as alternatives to the proposed project. The alternatives are summarized below. A detailed discussion of the alternatives to the proposed project is provided in Chapter 6 of this EIR.

- **No Project/No Development Alternative.** This alternative assumes that the project site would not be developed with the proposed project, and the project site would remain in its current condition and current uses.
- **Existing General Plan (No Density Bonus/Maximum General Plan Residential Density and Commercial Intensity) Alternative.** This alternative assumes that the project site would be developed pursuant to the existing residential and commercial land use designations, at the maximum density and intensity of the existing *Carlsbad General Plan* and underlying zoning designations of the project site. This alternative would allow a total of 180 dwelling units (which would include 36 age-restricted affordable units), and 45,000 square foot of specialty retail.
- **Reduced Project (No Density Bonus/Growth Management Control Point [GMCP] General Plan Density).** This alternative assumes that the residentially designated portion of the project site would be developed at a GMCP of 12 dwelling units per acre. Under this alternative, approximately 144 attached residential units (townhomes or condominiums) would be developed, on the residential parcel, with approximately 29 units dedicated as affordable units. This alternative would include approximately 25,000 square feet of commercial development on the commercial parcel, consisting of 15,000 square feet of specialty retail and 10,000 square feet of restaurant). No density bonus would be applied under this alternative.
- **Previously-Proposed Plan Alternative.** Under this alternative, 218 dwelling units plus 15 inclusionary (affordable) accessory residential dwelling units for a total of 233 dwelling units, and up to 16,000 square feet of commercial uses would be developed.
- **Alternative Project Location.** This alternative would develop the proposed project on an alternative site location, known as “Sunny Creek.” This alternative site is located at the northwest corner of College Boulevard and El Camino Real. This alternative would include a total of 276 dwelling units. Of the 276 units, 41 would be developed as age-restricted inclusionary housing units and the remaining 235 units would be townhomes. The alternative site would also be developed with 60,000 square feet of commercial uses.

2.4.1 Environmentally Superior Alternative

The No Project/No Development Alternative is considered the environmentally superior alternative to the proposed project as it would avoid the following impacts identified for the proposed project: biological resources, cultural resources, geology/soils, hazards and hazardous materials, hydrology and water quality, and land use. However, CEQA Guidelines Section 15126.6(e)(2) states that “if the environmentally-superior alternative is the No Project Alternative, the EIR shall also identify an environmentally-superior alternative among the other alternatives.” As shown in Table 2-3, the Alternative Project Location would be the environmentally superior alternative because this alternative would avoid the potential impact associated with hazardous materials (asbestos-containing materials [ACM] and lead-based paint [LBP]), paleontological resources, and noise (rooftop deck activities).



Table 2-3. Comparison of Alternative Impacts to Proposed Project

Environmental Issue Area	Proposed Project	No Project/No Development Alternative	Existing General Plan (No Density Bonus/Maximum General Plan Residential Density and Commercial Intensity) Alternative	Reduced Project (No Density Bonus/GMCP General Plan Density) Alternative	Previously Proposed Plan Alternative	Alternative Project Location
Aesthetics/Grading	NA	NA This alternative would avoid any grading or topographical alteration of the project site.	NA Grading would be required and similar topographical changes would be necessary as compared to the proposed project.	NA Grading would be required and similar topographical changes would be necessary as compared to the proposed project.	NA Grading would be required and similar topographical changes would be necessary as compared to the proposed project.	NA Grading would be required; however, this site does not contain steep slopes and less topographical change would be required to implement this alternative as compared to the proposed project.
Agriculture and Forestry Resources	NA	NA This alternative would not change the existing conditions of the site, although no agricultural resources are identified on the site.	NA This alternative would change the existing conditions of the site, although no agricultural resources are identified on the site.	NA This alternative would change the existing conditions of the site, although no agricultural resources are identified on the site.	NA This alternative would change the existing conditions of the site, although no agricultural resources are identified on the site.	NA This alternative would change the existing conditions of the site, although no agricultural resources are identified on the alternative location.

Table 2-3. Comparison of Alternative Impacts to Proposed Project

Environmental Issue Area	Proposed Project	No Project/No Development Alternative	Existing General Plan (No Density Bonus/Maximum General Plan Residential Density and Commercial Intensity) Alternative	Reduced Project (No Density Bonus/GMCP General Plan Density) Alternative	Previously Proposed Plan Alternative	Alternative Project Location
Air Quality	NA	<p>NA</p> <p>The existing baseline air emissions would remain the same as no new development would occur.</p>	<p>Greater</p> <p>Construction: Emissions would be greater for VOC and PM_{2.5} as compared to the project. Emissions would be less for NOx, CO, SO₂, and PM₁₀ as compared to the project.</p> <p>Operation: Emissions of NOx, SO₂, PM₁₀ and PM_{2.5} would be greater as compared to the project. Emissions of VOC and CO would be less as compared to the project.</p>	<p>Greater</p> <p>Construction: Emissions would be greater for VOC and PM_{2.5} as compared to the project. Emissions would be less for NOx, CO, SO₂, and PM₁₀ as compared to the project.</p> <p>Operation: Emissions of all criteria pollutants would be less as compared to the proposed project.</p>	<p>Greater</p> <p>Construction: Emissions would be greater for VOC and PM_{2.5} as compared to the project. Emissions would be less for NOx, CO, SO₂, and PM₁₀ as compared to the project.</p> <p>Operation: Emissions of NOx, SO₂, and PM_{2.5} would be greater as compared to the project. Emissions of VOC, CO and PM_{2.5} would be less compared to the project.</p>	<p>Greater</p> <p>Construction: Emissions would be greater for VOC, PM₁₀, and PM_{2.5} as compared to the project. Emissions would be less for NOx, CO, and SO₂ as compared to the project.</p> <p>Operation: Emissions of all criteria pollutants would be higher as compared to the proposed project.</p>



Table 2-3. Comparison of Alternative Impacts to Proposed Project

Environmental Issue Area	Proposed Project	No Project/No Development Alternative	Existing General Plan (No Density Bonus/Maximum General Plan Residential Density and Commercial Intensity) Alternative	Reduced Project (No Density Bonus/GMCP General Plan Density) Alternative	Previously Proposed Plan Alternative	Alternative Project Location
Biological Resources	LTSM	<p>Avoid</p> <p>Because no changes to this site would occur, this alternative would avoid potential indirect effects related to non-wetland WOUS/waters of the state and unvegetated streambed.</p>	<p>Similar</p> <p>This alternative would involve site disturbance and, similar to the project, would have potential indirect effects related to non-wetland WOUS/waters of the state and unvegetated streambed, as well as indirect effects such as light spillage into adjacent habitats.</p>	<p>Similar</p> <p>This alternative would involve site disturbance and, similar to the project, would have potential indirect effects related to non-wetland WOUS/waters of the state and unvegetated streambed, as well as indirect effects such as light spillage into adjacent habitats.</p>	<p>Similar</p> <p>This alternative would involve site disturbance and, similar to the project, would have potential indirect effects related to non-wetland WOUS/waters of the state and unvegetated streambed, as well as indirect effects such as light spillage into adjacent habitats.</p>	<p>Greater</p> <p>This alternative is located in a more biologically sensitive area, in proximity to a riparian habitat area with the potential to support sensitive species. Also, development at this location would convert non-native grasslands that have the potential to support raptor foraging.</p>

Table 2-3. Comparison of Alternative Impacts to Proposed Project

Environmental Issue Area	Proposed Project	No Project/No Development Alternative	Existing General Plan (No Density Bonus/Maximum General Plan Residential Density and Commercial Intensity) Alternative	Reduced Project (No Density Bonus/GMCP General Plan Density) Alternative	Previously Proposed Plan Alternative	Alternative Project Location
Cultural Resources	LTSM	Avoid Because no development would occur under this alternative, the potential impact associated with inadvertent discovery would be avoided.	Similar Because grading and development would occur, this alternative would result in a potential impact associated with inadvertent discovery.	Similar Because grading and development would occur, this alternative would result in a potential impact associated with inadvertent discovery.	Similar Because grading and development would occur, this alternative would result in a potential impact associated with inadvertent discovery.	Similar Because grading and development would occur, this alternative would result in a potential impact associated with inadvertent discovery. However, this alternative could avoid paleontological impacts associated with the project, as less grading and deep excavation into geologic formations would be required.
Geology/Soils	LTSM	Avoid Because no additional grading or development would occur, this alternative would avoid the potential geology/soils impact.	Similar Because grading and development would occur, this alternative would result in a potential impact similar to the project.	Similar Because grading and development would occur, this alternative would result in a potential impact similar to the project.	Similar Because grading and development would occur, this alternative would result in a potential impact similar to the project.	Similar Because grading and development would occur, this alternative would result in a potential impact similar to the project.



Table 2-3. Comparison of Alternative Impacts to Proposed Project

Environmental Issue Area	Proposed Project	No Project/No Development Alternative	Existing General Plan (No Density Bonus/Maximum General Plan Residential Density and Commercial Intensity) Alternative	Reduced Project (No Density Bonus/GMCP General Plan Density) Alternative	Previously Proposed Plan Alternative	Alternative Project Location
Greenhouse Gas Emissions/Climate Change	NA	NA The existing baseline GHG emissions would remain the same as no new development would occur.	Greater This alternative would emit 2,951 MTCO ₂ e, which is greater than the proposed project.	Greater This alternative would emit 2,489 MTCO ₂ e, which is greater than the proposed project.	Greater This alternative would emit 2,965 MTCO ₂ e, which is greater than the proposed project.	Greater This alternative would emit 4,188 MTCO ₂ e, which is greater than the proposed project.
Hazards and Hazardous Materials	LTSM	Avoid This alternative would not change the existing conditions of the site.	Similar Because grading and development would occur, this alternative would result in a potential impact similar to the project.	Similar Because grading and development would occur, this alternative would result in a potential impact similar to the project.	Similar Because grading and development would occur, this alternative would result in a potential impact similar to the project.	Less Because no structures are located on the project site, this alternative would avoid the potential impact associated with ACMs and LBP.
Hydrology and Water Quality	LTSM	Avoid This alternative would not change the existing conditions of the site.	Similar Because grading and development would occur, this alternative would result in a potential impact similar to the project.	Similar Because grading and development would occur, this alternative would result in a potential impact similar to the project.	Similar Because grading and development would occur, this alternative would result in a potential impact similar to the project.	Similar Because grading and development would occur, this alternative would result in a potential impact similar to the project.

Table 2-3. Comparison of Alternative Impacts to Proposed Project

Environmental Issue Area	Proposed Project	No Project/No Development Alternative	Existing General Plan (No Density Bonus/Maximum General Plan Residential Density and Commercial Intensity) Alternative	Reduced Project (No Density Bonus/GMCP General Plan Density) Alternative	Previously Proposed Plan Alternative	Alternative Project Location
Land Use Planning	LTSM	Avoid This alternative would not change the existing conditions of the site, therefore no mitigation would be required.	Similar Because new housing/residents would be located at the site under this alternative, the airport noise disclosure requirements would be required.	Similar Because new housing/residents would be located at the site under this alternative, the airport noise disclosure requirements would be required.	Similar Because new housing/residents would be located at the site under this alternative, the airport noise disclosure requirements would be required.	Similar Because new housing/residents would be located at the alternative site under this alternative, the airport noise disclosure requirements would be required.
Noise	LTSM	Avoid This alternative would not change the existing conditions of the site, so there would be no potential to impact existing adjacent sensitive receptors.	Similar This alternative would require similar noise mitigation to maintain interior standards and would have the potential to impact adjacent residences from rooftop noise.	Similar This alternative would require similar noise mitigation to maintain interior standards and would have the potential to impact adjacent residences from rooftop noise.	Similar This alternative would require similar noise mitigation to maintain interior standards and would have the potential to impact adjacent residences from rooftop noise.	Less This alternative would require similar noise mitigation to maintain interior standards; however, it would avoid the potential impact to adjacent residences from rooftop noise.



Table 2-3. Comparison of Alternative Impacts to Proposed Project

Environmental Issue Area	Proposed Project	No Project/No Development Alternative	Existing General Plan (No Density Bonus/Maximum General Plan Residential Density and Commercial Intensity) Alternative	Reduced Project (No Density Bonus/GMCP General Plan Density) Alternative	Previously Proposed Plan Alternative	Alternative Project Location
Population/Housing	NA	NA This alternative would not change the existing conditions of the site, so no new housing would be constructed	NA Because development would occur, this alternative would introduce new population/housing to the project site, although no significant impact would result.	NA Because development would occur, this alternative would introduce new population/housing to the project site, although no significant impact would result.	NA Because development would occur, this alternative would introduce new population/housing to the project site, although no significant impact would result.	NA Because development would occur, this alternative would introduce new population/housing to the project site, although no significant impact would result.
Public Services	NA	NA This alternative would not change the existing conditions of the site.	NA Because development would occur, this alternative would introduce new population/housing and commercial uses to the project site, although no significant impact would result to public services.	NA Because development would occur, this alternative would introduce new population/housing and commercial uses to the project site, although no significant impact would result to public services.	NA Because development would occur, this alternative would introduce new population/housing and commercial uses to the project site, although no significant impact would result to public services.	NA Because development would occur, this alternative would introduce new population/housing and commercial uses to the project site, although no significant impact would result to public services.

Table 2-3. Comparison of Alternative Impacts to Proposed Project

Environmental Issue Area	Proposed Project	No Project/No Development Alternative	Existing General Plan (No Density Bonus/Maximum General Plan Residential Density and Commercial Intensity) Alternative	Reduced Project (No Density Bonus/GMCP General Plan Density) Alternative	Previously Proposed Plan Alternative	Alternative Project Location
Transportation/Circulation	NA	<p>NA</p> <p>This alternative would not change the existing conditions of the site; therefore there would be no increase in trip generation at the project site.</p>	<p><u>VTM per capita would exceed the threshold, mitigation would be required to reduce impact to less than significant, similar to the project</u> Greater This alternative would generate 2,540 ADT, approximately 481 more ADT than the proposed project.</p>	<p><u>VTM per capita would exceed the threshold, mitigation would be required to reduce impact to less than significant, similar to the project</u> Greater This alternative would generate 2,317 ADT, approximately 258 more ADT than the proposed project.</p>	<p><u>VTM per capita would exceed the threshold, mitigation would be required to reduce impact to less than significant, similar to the project</u> Greater This alternative would generate 2,273 ADT, approximately 214 more ADT than the proposed project.</p>	<p><u>VTM per capita would exceed the threshold, mitigation would be required to reduce impact to less than significant, similar to the project</u> Greater This alternative would generate 3,447 ADT, approximately 1,388 more ADT than the proposed project.</p>



Table 2-3. Comparison of Alternative Impacts to Proposed Project

Environmental Issue Area	Proposed Project	No Project/No Development Alternative	Existing General Plan (No Density Bonus/Maximum General Plan Residential Density and Commercial Intensity) Alternative	Reduced Project (No Density Bonus/GMCP General Plan Density) Alternative	Previously Proposed Plan Alternative	Alternative Project Location
Utilities and Service Systems	NA	NA This alternative would not change the existing conditions of the site; therefore, there would be no increase in demand for utilities and services systems.	NA Because development would occur, this alternative would introduce new population/housing and commercial uses to the project site, although no significant impact would result to utilities and service systems.	NA Because development would occur, this alternative would introduce new population/housing and commercial uses to the project site, although no significant impact would result to utilities and service systems.	NA Because development would occur, this alternative would introduce new population/housing and commercial uses to the project site, although no significant impact would result to utilities and service systems.	NA Because development would occur, this alternative would introduce new population/housing and commercial uses to the project site, although no significant impact would result to utilities and service systems.

Notes:

NA=No significant impact identified associated with the project.

L TSM=Less than significant impact with mitigation.

Avoid=Impacts under this alternative avoided as compared to impacts for the proposed project.

Reduced=Impacts under this alternative reduced as compared to impacts for the proposed project.

Similar=Impacts under this alternative similar to impacts for the proposed project.

Greater=Impacts under this alternative greater to impacts for the proposed project.

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5.7 Greenhouse Gas Emissions/Climate Change

The following chapter replaces previously circulated Draft EIR Section 5.7. The previously circulated Section 5.7 evaluated the proposed project's potential greenhouse gas emissions/climate change impacts with reliance of the City's Climate Action Plan. As explained in Section 1.0 of this Recirculated Draft EIR, the potential greenhouse gas emissions/climate change impacts of the proposed project were reevaluated without reliance on the CAP, but rather under an efficiency metric threshold.

The following provides the revised Chapter 5.7 Greenhouse Gas Emissions/Climate Change.

Introduction

This section summarizes the existing conditions, describes the regulatory framework, and discusses potential impacts with regard to greenhouse gas (GHG) emissions as a result of implementation of the proposed project. The following technical study analyzes the potential impacts from the proposed project:

- *Air Quality and Greenhouse Gas Emissions Analysis Technical Report for the Marja Acres Community Plan* (Dudek 2020) (Appendix B of this EIR)

The technical appendices are included on the attached CD found on the back cover of this Recirculated Draft EIR and are available for review online at the following City of Carlsbad website address: <http://www.carlsbadca.gov/services/depts/planning/agendas.asp>. Additional background was also obtained from the *Carlsbad General Plan* (City of Carlsbad 2015a).

5.7.1 Existing Conditions

Climate Change Overview

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind patterns, lasting for an extended period of time (decades or longer). The Earth's temperature depends on the balance between energy entering and leaving the planet's system. Many factors, both natural and human, can cause changes in Earth's energy balance, including variations in the Sun's energy reaching Earth, changes in the reflectivity of Earth's atmosphere and surface, and changes in the greenhouse effect, which affects the amount of heat retained by the Earth's atmosphere.

The greenhouse effect is the trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. 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 it into space and toward the Earth. The greenhouse effect is a natural process that contributes to regulating the Earth's temperature and creates a pleasant, livable environment on the Earth. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and causing the Earth's surface temperature to rise.

The scientific record of the Earth's climate shows that the climate system varies naturally over a wide range of time scales and that, in general, climate changes prior to the Industrial Revolution in the 1700s can be explained by natural causes, such as changes in solar energy, volcanic eruptions, and natural changes in GHG concentrations. Recent climate changes, in particular the warming observed

over the past century, however, cannot be explained by natural causes alone. Rather, it is extremely likely that human activities have been the dominant cause of that warming since the mid-20th century and is the most significant driver of observed climate change. Human influence on the climate system is evident from the increasing GHG concentrations in the atmosphere, positive radiative forcing, observed warming, and improved understanding of the climate system. The atmospheric concentrations of GHGs have increased to levels unprecedented in the last 800,000 years, primarily from fossil fuel emissions and secondarily from emissions associated with land use changes (Appendix B of this Recirculated Draft EIR). Continued emissions of GHGs will cause further warming and changes in all components of the climate system.

Greenhouse Gases

A GHG is any gas that absorbs infrared radiation in the atmosphere; in other words, GHGs trap heat in the atmosphere. GHGs include, but are not limited to, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), O₃, water vapor, hydrofluorocarbons (HFC), hydrochlorofluorocarbons (HCFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF₆). Some GHGs, such as CO₂, CH₄, and N₂O, occur naturally and are emitted to the atmosphere through natural processes and human activities. Of these gases, CO₂ and CH₄ are emitted in the greatest quantities from human activities. Manufactured GHGs, which have a much greater heat absorption potential than CO₂, include fluorinated gases, such as HFCs, HCFCs, PFCs, and SF₆, which are associated with certain industrial products and processes. The most common GHGs and their sources are described below.

Carbon Dioxide. CO₂ is a naturally occurring gas and a by-product of human activities and is the principal anthropogenic GHG that affects the Earth's radiative balance. Natural sources of CO₂ include respiration of bacteria, plants, animals, and fungus; evaporation from oceans; volcanic out-gassing; and decomposition of dead organic matter. Human activities that generate CO₂ are from the combustion of fuels, such as coal, oil, natural gas, and wood, and changes in land use.

Methane. CH₄ is produced through both natural and human activities. CH₄ is a flammable gas and is the main component of natural gas. CH₄ is produced through anaerobic (without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide. N₂O is produced through natural and human activities, mainly through agricultural activities and natural biological processes, although fuel burning and other processes also create N₂O. Sources of N₂O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers, manure management, industrial processes (such as in nitric acid production, nylon production, and fossil-fuel-fired power plants), vehicle emissions, and using N₂O as a propellant (such as in rockets, race cars, and aerosol sprays).

Fluorinated Gases. Fluorinated gases (also referred to as F-gases) are synthetic powerful GHGs emitted from many industrial processes. Fluorinated gases are commonly used as substitutes for stratospheric O₃-depleting substances (e.g., CFCs, HCFCs, and halons). The most prevalent fluorinated gases include the following:

- **Hydrofluorocarbons:** HFCs are compounds containing only hydrogen, fluorine, and carbon atoms. HFCs are synthetic chemicals used as alternatives to O₃-depleting substances in serving many industrial, commercial, and personal needs. HFCs are emitted as byproducts of industrial processes and are used in manufacturing.
- **Perfluorocarbons:** PFCs are a group of human-made chemicals composed of carbon and fluorine only. These chemicals were introduced as alternatives, with HFCs, to the O₃-depleting substances. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing. Since PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere, these chemicals have long lifetimes, ranging between 10,000 and 50,000 years.
- **Sulfur Hexafluoride:** SF₆ is a colorless gas soluble in alcohol and ether and slightly soluble in water. SF₆ is used for insulation in electric power transmission and distribution equipment, semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.
- **Nitrogen Trifluoride:** NF₃ is used in the manufacture of a variety of electronics, including semiconductors, and flat panel displays.

Chlorofluorocarbons. CFCs are synthetic chemicals that have been used as cleaning solvents, refrigerants, and aerosol propellants. CFCs are chemically unreactive in the lower atmosphere (troposphere), and the production of CFCs was prohibited in 1987 due to the chemical destruction of stratospheric O₃.

Hydrochlorofluorocarbons. HCFCs are a large group of compounds with a structure very close to that of CFCs—containing hydrogen, fluorine, chlorine, and carbon atoms—but including 1 or more hydrogen atoms. Like HFCs, HCFCs are used in refrigerants and propellants. HCFCs were also used in place of CFCs for some applications; however, their use in general is being phased out.

Black Carbon. Black carbon is a component of fine particulate matter (PM_{2.5}), which has been identified as a leading environmental risk factor for premature death. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation, influences cloud formation, and darkens the surface of snow and ice, which accelerates heat absorption and melting. Black carbon is a short-lived species that varies spatially, which makes it difficult to quantify the global warming potential (GWP). DPM emissions are a major source of black carbon and are TACs that have been regulated and controlled in California for several decades to protect public health. In relation to declining DPM from the CARB's regulations pertaining to diesel engines, diesel fuels, and burning activities, CARB estimates that annual black carbon emissions in California have reduced by 70% between 1990 and 2010, with 95% control expected by 2020 (CARB 2014a).

Water Vapor. The primary source of water vapor is evaporation from the ocean, with additional vapor generated by sublimation (change from solid to gas) from ice and snow, evaporation from other water bodies, and transpiration from plant leaves. Water vapor is the most important, abundant, and variable GHG in the atmosphere and maintains a climate necessary for life.

Ozone. Tropospheric O₃, which is created by photochemical reactions involving gases from both natural sources and human activities, acts as a GHG. Stratospheric O₃, which is created by the interaction between solar ultraviolet radiation and molecular oxygen (O₂), plays a decisive role in the stratospheric radiative balance. Depletion of stratospheric O₃, due to chemical reactions that may be enhanced by climate change, results in an increased ground-level flux of ultraviolet-B radiation.

Aerosols. Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light.

Greenhouse Gas Inventories

Global

According to the World Resources Institute, anthropogenic GHG emissions worldwide in 2017 (the most recent year for which data is available) totaled approximately 50,860 million metric tons CO₂e (Appendix B of this Recirculated Draft EIR). Six countries—China, the United States, the Russian Federation, India, Japan, and Brazil—and the European community accounted for approximately 65 percent of the total global emissions, approximately 33,290 MMT CO₂e (Appendix B of this Recirculated Draft EIR). Table 11 provided in Appendix B of this Recirculated Draft EIR provides a summary of the 2014 GHG emissions from each of these countries.

National

Per the 2019 EPA Inventory of U.S. GHG Emissions and Sinks: 1990–2017, total U.S. GHG emissions were approximately 6,457 MMT CO₂e in 2017 (EPA 2019). The primary GHG emitted by human activities in the United States was CO₂, which represented approximately 81.6% of total GHG emissions (6,457 MMT CO₂e). The largest source of CO₂, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 93.2% of CO₂ emissions in 2017 (4,912.0 MMT CO₂e). Relative to the 1990 emissions level, gross U.S. GHG emissions in 2017 were 1.3% higher; however, the gross emissions were down from a high of 15.7% above the 1990 level that occurred in 2007. GHG emissions decreased from 2016 to 2017 by 0.5% (35.5 MMT CO₂e) and, overall, net emissions in 2017 were 13% below 2005 levels (EPA 2019).

California

According to California's 2000–2016 GHG emissions inventory (2018 edition), California emitted 429 MMT CO₂e in 2016, including emissions resulting from out-of-state electrical generation (Appendix B of this EIR). The sources of GHG emissions in California include transportation, industrial uses, electric power production from both in state and out-of-state sources, commercial and residential uses, agriculture, high GWP substances, and recycling and waste. The California GHG emission source categories and their relative contributions in 2016 are presented in Table 5.7-1.

Table 5.7-1. GHG Emissions Sources in California

Source Category	Annual GHG Emissions (MMT CO ₂ e)	Percent of Total*
Transportation	176.1	41%
Industrial	98.8	23%
Electricity (in state)	42.9	10%
Electricity (imports)	25.8	6%

Table 5.7-1. GHG Emissions Sources in California

Source Category	Annual GHG Emissions (MMT CO ₂ e)	Percent of Total*
Agriculture	34.4	8%
Residential	30.1	7%
Commercial	21.5	5%
Total	429.4	100%

Source: Appendix B of this Recirculated Draft EIR

Notes:

GHG = greenhouse gas; MMT CO₂e = million metric tons of carbon dioxide equivalent.

* Column may not add due to rounding.

Between 2000 and 2016, per-capita GHG emissions in California dropped from a peak of 14 MT per person in 2001 to 10.8 MT per person in 2016, representing a 23% decrease. In addition, total GHG emissions in 2015 were approximately 12 MMT CO₂e less than 2015 emissions (CARB 2018).

County

According to the GHG inventory data compiled by the Energy Policy Initiative Center, in 2010, the County (as defined to include all cities therein and unincorporated County areas) emitted 34.7 MMT CO₂e (EPIC 2015). As summarized in Table 5.7-2, San Diego County GHG Emissions by Sectors, on-road transportation created 37% of these emissions. Similar to emissions trends statewide, electricity generation is the second biggest emitter.

Table 5.7-2. San Diego County GHG Emissions by Sectors

Source Category	Annual GHG Emissions (MMT CO ₂ e)	Percent of Total
On-road transportation	13.14	37.2
Electricity generation	7.97	22.6
Natural gas end uses	2.84	8.0
Heavy Duty Trucks & Vehicles	1.89	5.4
Solid Waste	1.75	4.9
Other Fuels	1.64	4.6
Industrial	1.43	4.1
Aviation	1.37	3.9
Off-Road	0.92	2.6
Wildfire	0.81	2.3
Other – Thermal Cogeneration	0.64	1.8
Water	0.52	1.5
Wastewater	0.16	0.5
Rail	0.11	0.3
Agriculture	0.08	0.2
Marine Vessels	0.05	0.1

Table 5.7-2. San Diego County GHG Emissions by Sectors

Source Category	Annual GHG Emissions (MMT CO ₂ e)	Percent of Total
Development and Sequestration	(0.65)	N/A
Total	34.67	100

Source: Appendix B of this Recirculated Draft EIR

Notes:

GHG=greenhouse gas; MMT CO₂e=million metric tons of carbon dioxide equivalent per year

Carlsbad

Table 5.7-3 provides a summary of the 2012 GHG emissions inventory for the City. The inventory tallied emissions from seven source categories on-road transportation, electricity, natural gas, solid waste, off-road transportation, water and wastewater. As shown, annual GHG emissions are 977,000 MT CO₂e.

Table 5.7-3. City of Carlsbad Greenhouse Gas Emissions by Sectors

Source Category	Annual GHG Emissions (MT CO ₂ e)	Percent of Total
On-road Transportation ¹	488,000	49.9
Electricity	301,000	30.8
Natural gas	134,000	13.7
Solid Waste	25,000	2.6
Off-Road Transportation ²	14,000	1.4
Water	12,000	1.2
Wastewater	3,000	0.3
Total	977,000	100

Source: Appendix B of this Recirculated Draft EIR

Notes:

GHG emissions for each category are rounded. Sums may not add up to totals due to rounding.

1 Based on SANDAG Series 13 vehicle miles traveled estimates. 2012 is the Series 13 Base Year.

2 This category includes emissions from the off-road equipment sub-categories as identified in the Carlsbad CAP (lawn and garden, construction, industrial, and light commercial equipment). The sub-categories do not include all off-road vehicles and equipment.

MT CO₂e=million metric tons of carbon dioxide equivalent

Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. The 2014 *Intergovernmental Panel on Climate Change Synthesis Report* indicated that warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. Signs that global climate change has occurred include warming of the atmosphere and ocean, diminished amounts of snow and ice, and rising sea levels (IPCC 2014).

In California, climate change impacts have the potential to affect sea level rise, agriculture, snowpack and water supply, forestry, wildfire risk, public health, and electricity demand and supply (CCCC 2006).

The primary effect of global climate change has been a 0.2° Celsius (°C) rise in average global tropospheric temperature per decade, determined from meteorological measurements worldwide between 1990 and 2005. Scientific modeling predicts that continued emissions of GHGs at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. A warming of about 0.2°C (0.36° Fahrenheit (°F)) per decade is projected, and there are identifiable signs that global warming could be taking place.

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. The average temperatures in California have increased, leading to more extreme hot days and fewer cold nights; shifts in the water cycle have been observed, with less winter precipitation falling as snow, and both snowmelt and rainwater running off earlier in the year; sea levels have risen; and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (CAT 2010).

An increase in annual average temperature is a reasonably foreseeable effect of climate change. Observed changes over the last several decades across the Western United States reveal clear signals of climate change. Statewide average temperatures increased by about 1.7°F from 1895 to 2011, and warming has been the greatest in the Sierra Nevada (CCCC 2012). By 2050, California is projected to warm by approximately 2.7°F above 2000 averages, a threefold increase in the rate of warming over the last century. By 2100, average temperatures could increase by 4.1 to 8.6°F, depending on emissions levels. Springtime warming—a critical influence on snowmelt—will be particularly pronounced. Summer temperatures will rise more than winter temperatures, and the increases will be greater in inland California, compared to the coast. Heat waves will be more frequent, hotter, and longer. There will be fewer extremely cold nights (CCCC 2012). A decline of Sierra snowpack, which accounts for approximately half of the surface water storage in California and much of the state's water supply, by 30% to as much as 90% is predicted over the next 100 years (CAT 2006).

Model projections for precipitation over California continue to show the Mediterranean pattern of wet winters and dry summers with seasonal, year-to-year, and decade-to-decade variability. For the first time, however, several of the improved climate models shift toward drier conditions by the mid-to-late 21st century in Central and, most notably, Southern California. By late-century, all projections show drying, and half of them suggest 30-year average precipitation will decline by more than 10% below the historical average (CCCC 2012).

A summary of current and future climate change impacts to resource areas in California, as discussed in the *Safeguarding California: Reducing Climate Risk* (CNRA 2014), is provided below.

Agriculture. The impacts of climate change on the agricultural sector are far more severe than the typical variability in weather and precipitation patterns that occur year to year. The agriculture sector and farmers face some specific challenges that include more drastic and unpredictable precipitation and weather patterns; extreme weather events that range from severe flooding and extreme drought to destructive storm events; significant shifts in water availability and water quality; changes in pollinator lifecycles; temperature fluctuations, including extreme heat stress and decreased chill hours; increased risks from invasive species and weeds, agricultural pests, and plant diseases; and disruptions to the transportation and energy infrastructure supporting agricultural production. These challenges and associated short-term and long-term impacts can have both positive and negative effects on agricultural production. Nonetheless, it is predicted that current crop and livestock production will suffer long-term negative effects resulting in a substantial decrease in the agricultural sector if not managed or mitigated.

Biodiversity and Habitat. The state's extensive biodiversity stems from its varied climate and assorted landscapes, which have resulted in numerous habitats where species have evolved and adapted over time. Specific climate change challenges to biodiversity and habitat include species migration in response to climatic changes, range shift and novel combinations of species; pathogens, parasites, and disease; invasive species; extinction risks; changes in the timing of seasonal life-cycle events; food web disruptions; and threshold effects (i.e., a change in the ecosystem that results in a "tipping point" beyond which irreversible damage or loss has occurs). Habitat restoration, conservation, and resource management across California and through collaborative efforts among public, private, and nonprofit agencies has assisted in the effort to fight climate change impacts on biodiversity and habitat. One of the key measures in these efforts is ensuring species' ability to relocate as temperature and water availability fluctuate as a result of climate change based on geographic region.

Energy. The energy sector provides California residents with a supply of reliable and affordable energy through a complex integrated system. Specific climate change challenges for the energy sector include temperature, fluctuating precipitation patterns, increasing extreme weather events, and sea level rise. Increasing temperatures and reduced snowpack negatively impact the availability of a steady flow of snowmelt to hydroelectric reservoirs. Higher temperatures also reduce the capacity of thermal power plants, since power plant cooling is less efficient at higher ambient temperatures. Increased temperatures will also increase electricity demand associated with air conditioning. Natural gas infrastructure in Coastal California is threatened by sea level rise and extreme storm events.

Forestry. Forests occupy approximately 33% of California's 100 million acres and provide key benefits, such as wildlife habitat, absorption of CO₂, renewable energy, and building materials. The most significant climate change-related risks to forests are accelerated risk of wildfire and more frequent and severe droughts. Droughts have resulted in more large-scale mortalities and, combined with increasing temperatures, have led to an overall increase in wildfire risks. Increased wildfire intensity subsequently increases public safety risks, property damage, fire suppression and emergency response costs, watershed and water quality impacts, and vegetation conversions. These factors contribute to decreased forest growth, geographic shifts in tree distribution, loss of fish and wildlife habitat, and decreased carbon absorption. Climate change may result in increased establishment of non-native species, particularly in rangelands where invasive species are already a problem. Invasive species may be able to exploit temperature or precipitation changes or quickly occupy areas denuded by fire, insect mortality, or other climate change effects on vegetation.

Ocean and Coastal Ecosystems and Resources. Sea level rise, changing ocean conditions, and other climate change stressors are likely to exacerbate long-standing challenges related to ocean and coastal ecosystems in addition to threatening people and infrastructure located along the California coastline and in coastal communities. Sea level rise, in addition to more frequent and severe coastal storms and erosion, are threatening vital infrastructure, such as roads, bridges, power plants, ports and airports, gasoline pipes, and emergency facilities, as well as negatively impacting the coastal recreational assets, such as beaches and tidal wetlands. Water quality and ocean acidification threaten the abundance of seafood and other plant and wildlife habitats throughout California and globally.

Public Health. Climate change can impact public health through various environmental changes and is the largest threat to human health in the 21st century. Changes in precipitation patterns affect public health primarily through potential for altered water supplies, and extreme events, such as heat, floods, droughts, and wildfires. Increased frequency, intensity, and duration of extreme heat and heat waves is likely to increase the risk of mortality due to heat-related illness, as well as

exacerbate existing chronic health conditions. Other extreme weather events are likely to negatively impact air quality and increase or intensify respiratory illness, such as asthma and allergies. Additional health impacts that may be impacted by climate change include cardiovascular disease, vector-borne diseases, mental health impacts, and malnutrition injuries. Increased frequency of these ailments is likely to subsequently increase the direct risk of injury and/or mortality.

Transportation. Residents of California rely on airports, seaports, public transportation, and an extensive roadway network to gain access to destinations, goods, and services. While the transportation industry is a source of GHG emissions, it is also vulnerable to climate change risks. Particularly, sea level rise and erosion threaten many coastal California roadways, airports, seaports, transit systems, bridge supports, and energy and fueling infrastructure. Increasing temperatures and extended periods of extreme heat threaten the integrity of the roadways and rail lines. High temperatures cause the road surfaces to expand, which leads to increased pressure and pavement buckling. High temperatures can also cause rail breakages, which could lead to train derailment. Other forms of extreme weather events, such as extreme storm events, can negatively impact infrastructure, which can impair movement of peoples and goods, or potentially block evacuation routes and emergency access roads. Increased wildfires, flooding, erosion risks, landslides, mudslides, and rockslides can all profoundly impact the transportation system and pose a serious risk to public safety.

Water. Water resources in California support residences, plants, wildlife, farmland, landscapes, and ecosystems and bring trillions of dollars in economic activity. Climate change could seriously impact the timing, form, amount of precipitation, runoff patterns, and frequency and severity of precipitation events. Higher temperatures reduce the amount of snowpack and lead to earlier snowmelt, which can impact water supply availability, natural ecosystems, and winter recreation. Water supply availability during the intense dry summer months is heavily dependent on the snowpack accumulated during the winter. Increased risk of flooding has a variety of public health concerns, including water quality, public safety, property damage, displacement, and post-disaster mental health problems. Prolonged and intensified droughts can also negatively affect groundwater reserves and result in increased overdraft and subsidence. Droughts can also negatively impact agriculture and farmland throughout the state. The higher risk of wildfires can lead to increased erosion, which can negatively impact watersheds and result in poor water quality. Water temperatures are also prone to increase, which can negatively impact wildlife that rely on a specific range of temperatures for suitable habitat.

In May 2017, the California Natural Resources Agency (CNRA) released the draft *Safeguarding California Plan: 2017 Update*, which is a survey of current programmatic responses for climate change and contains recommendations for further actions (CNRA 2017).

5.7.2 Regulatory Setting

Federal

Federal regulations that address GHG's include Massachusetts vs. EPA, the Energy Independence and Security Act, and federal vehicle standards. These regulations are summarized in the *Air Quality and Greenhouse Gas Emissions Analysis Technical Report for the Marja Acres Community Plan* (Dudek 2020) (Appendix B of this Recirculated Draft EIR).

Notably, on September 19, 2019, the NHTSA and the EPA issued a final action entitled the "One National Program Rule" to enable the federal government to provide nationwide uniform fuel economy and greenhouse gas emission standards for automobile and light-duty trucks (EPA 2019). This action finalizes critical parts of the Safer, Affordable, Fuel-Efficient (SAFE) Vehicles Rule that was first

proposed in August 2018. This action makes clear that federal law preempts state and local tailpipe GHG emissions standards as well as zero emission vehicle (ZEV) mandates. California and other states have challenged federal actions that would delay or eliminate GHG reduction measures and have committed to cooperating with other countries to implement global climate change initiatives.

The timing and consequences of these types of federal decisions and subsequent challenges are speculative at this time (CARB 2019a). Relatedly, CARB has not determined at this time what impacts the SAFE rule may have on GHG emissions.

State

Executive Order S-3-05

In June 2005, Governor Schwarzenegger established California's GHG emissions reduction targets in Executive Order (EO) S-3-05, which are: GHG emissions should be reduced to 2000 levels by 2010; GHG emissions should be reduced to 1990 levels by 2020; and GHG emissions should be reduced to 80 percent below 1990 levels by 2050.

Assembly Bill 32

In furtherance of the goals established in EO S-3-05, the Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020.

Under AB 32, California Air Resources Board (CARB) is responsible for and is recognized as having the expertise to carry out and develop the programs and requirements necessary to achieve the GHG emissions reduction mandate of AB 32. Under AB 32, CARB must adopt regulations requiring the reporting and verification of statewide GHG emissions from specified sources. This program is used to monitor and enforce compliance with established standards. CARB is also required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 relatedly authorized CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted.

In 2007, CARB approved a limit on the statewide GHG emissions level for year 2020 consistent with the determined 1990 baseline (427 million metric tons of CO₂ equivalent [MMT CO₂e]). CARB's adoption of this limit is in accordance with Health and Safety Code Section 38550.

Further, in 2008, CARB adopted the *Climate Change Scoping Plan: A Framework for Change* (Scoping Plan) in accordance with Health and Safety Code Section 38561. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions for various emission sources/sectors to 1990 levels by 2020. The key elements of the Scoping Plan include the following (Appendix B of this Recirculated Draft EIR):

1. Expanding and strengthening existing energy efficiency programs, as well as building and appliance standards.
2. Achieving a statewide renewable energy mix of 33 percent.
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85 percent of California's GHG emissions.

4. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.
5. Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard.
6. Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation.

In 2014, CARB adopted the *First Update to the Climate Change Scoping Plan: Building on the Framework* (First Update). The First Update found that California is on track to meet the 2020 emissions reduction mandate established by AB 32 and noted that California could reduce emissions further by 2030 to levels squarely in line with those needed to stay on track to reduce emissions to 80 percent below 1990 levels by 2050 if the state realizes the expected benefits of existing policy goals.

In conjunction with the First Update, CARB identified "six key focus areas comprising major components of the state's economy to evaluate and describe the larger transformative actions that will be needed to meet the state's more expansive emission reduction needs by 2050" (Appendix B of this Recirculated Draft EIR). Those six areas are: (1) energy; (2) transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure); (3) agriculture; (4) water; (5) waste management; and (6) natural and working lands. The First Update identifies key recommended actions for each sector that will facilitate achievement of EO S-3-05's 2050 reduction goal.

On January 20, 2017, CARB released the *2017 Climate Change Scoping Plan Update* (Second Update) for public review and comment. This update presents CARB's strategy for achieving the state's 2030 GHG target as established in SB 32 (discussed below), including continuing the Cap-and-Trade Program through 2030, and includes a new approach to reduce GHGs from refineries by 20 percent. The Second Update incorporates approaches to cutting short-lived climate pollutants under the Short-Lived Climate Pollutant Reduction Strategy (a planning document that was adopted by CARB in March 2017) and acknowledges the need for reducing emissions in agriculture and highlights the work underway to ensure that California's natural and working lands increasingly sequester carbon. When discussing project-level GHG emissions reduction actions and thresholds, the Second Update states "achieving no net increase in GHG emissions is the correct overall objective, but it may not be appropriate or feasible for every development project. An inability to mitigate a project's GHG emissions to zero does not necessarily imply a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA" (Appendix B of this Recirculated Draft EIR). The Final Proposed Scoping Plan Update was adopted by CARB's Governing Board on December 14, 2017.

Executive Order B-30-15

Executive Order B-30-15, signed April 29, 2015, sets a goal of reducing GHG emissions within the state to 40 percent of 1990 levels by year 2030. Executive Order B-30-15 also directs CARB to update the Scoping Plan to quantify the 2030 GHG reduction goal for the state and requires State agencies to implement measures to meet the interim 2030 goal of Executive Order B-30-15, as well as the long-term goal for 2050 in Executive Order S-03-5. EO B-30-15 does not require local agencies to take any action to meet the new interim GHG reduction target.

Senate Bill 32

Senate Bill (SB) 32 was passed by the legislature and signed by the governor on September 8, 2016. The California Global Warming Solutions Act of 2006 designates CARB as the state agency charged with monitoring and regulating sources of emissions of GHGs. As noted above, CARB is required to approve a statewide GHG emissions limit equivalent to the statewide GHG emissions level in 1990 to be achieved by 2020 and to adopt rules and regulations in an open public process to achieve the maximum, technologically feasible, and cost-effective GHG emissions reductions. SB 32 requires CARB to further ensure that statewide GHG emissions are reduced to 40 percent below the 1990 level by 2030.

EO B-55-18

EO B-55-18 (September 2018) established a new statewide goal “to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter.” This executive order directed CARB to “work with relevant state agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal.”

State of California Building Energy Efficiency Standards (Title 24, Part 6)

Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California’s building standards. While not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically establishes Building Energy Efficiency Standards that are designed to ensure new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These standards are updated to consider and incorporate new energy-efficient technologies and construction methods.

The 2019 Title 24 standards are the currently applicable building energy efficiency standards and became effective on January 1, 2020. In general, single-family homes built to the 2019 standards are anticipated to use about 7 percent less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2016 standards, once rooftop solar electricity generation is factored in, single-family residences built under the 2019 standards will use approximately 53% less energy than those under the 2016 standards. Nonresidential buildings built to the 2019 standards will use an estimated 30 percent less energy than those built to the 2016 standards (Appendix B of this Recirculated Draft EIR).

California Green Building Code

The California Green Building Standards Code is commonly referred to as CALGreen and establishes minimum mandatory standards as well as voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The CALGreen standards took effect in January 2011 and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential and state-owned buildings and schools and hospitals. The CALGreen 2016 standards became effective on January 1, 2017. The mandatory standards require the following:

- Mandatory reduction in indoor water use through compliance with specified flow rates for plumbing fixtures and fittings.

- Mandatory reduction in outdoor water use through compliance with a local water efficient landscaping ordinance or the California Department of Water Resources' Model Water Efficient Landscape Ordinance.
- 65 percent of construction and demolition waste must be diverted from landfills.
- Mandatory inspections of energy systems to ensure optimal working efficiency.
- Inclusion of electric vehicle (EV) charging stations or designated spaces capable of supporting future charging stations.
- Low-pollutant emitting exterior and interior finish materials, such as paints, carpets, vinyl flooring, and particle boards.

The CALGreen standards also include voluntary efficiency measures that are provided at two separate tiers and implemented at the discretion of local agencies and applicants. The voluntary standards include:

- **Tier 1:** 15 percent improvement in energy requirements, stricter water conservation, 65 percent diversion of construction and demolition waste, 10 percent recycled content in building materials, 20 percent permeable paving, 20 percent cement reduction, and cool/solar-reflective roofs. CALGreen's more rigorous
- **Tier 2:** standards call for a 30% improvement in energy requirements, stricter water conservation, 75 percent diversion of construction and demolition waste, 15 percent recycled content in building materials, 30 percent permeable paving, 25 percent cement reduction, and cool/solar-reflective roofs.

California State Senate Bill 375

California State SB 375 was signed into law in 2008 and is intended to provide a means for achieving AB 32 GHG emissions target reduction goals from cars and light trucks through long-range regional growth strategies and transportation plans. SB 375 is directed toward California's 18 Metropolitan Planning Organizations (MPO).

Under SB 375, each MPO is required to develop a "Sustainable Communities Strategy" (SCS), a newly required element of the Regional Transportation Plan (RTP). SB 375 does not take over local planning functions, and a SCS does not in any way supersede a General Plan, specific plan, or local zoning ordinance. Additionally, SB 375 does not require any consistency between the SCS and these planning and development regulatory documents. However, the MPOs are required to develop the SCS through integrated land use and transportation planning and demonstrate an ability to attain the proposed reduction targets by 2020 and 2035.

CARB's targets for San Diego County call for the region to reduce per capita emissions 7 percent by 2020 and 13 percent by 2035 based on a 2005 baseline. There are no mandated targets beyond 2035.

The San Diego Association of Governments (SANDAG) adopted San Diego Forward: The Regional Plan (Regional Plan) on October 9, 2015, which combines and updates the region's two big picture planning documents: the Regional Comprehensive Plan (RCP) for the San Diego Region and the 2050 RTP and SCS. The Regional Plan reflects a strategy for a more sustainable future which includes investing in a transportation network that will provide people more travel choices, protects the environment, creates healthy communities, and stimulates economic growth to benefit all San

Diegans. The SCS charts a course toward lower GHG emissions related to vehicles and proposes other measures to make the San Diego region more environmentally sustainable.

In December 2015, CARB, by resolution, accepted SANDAG's GHG emissions quantification analysis and determination that, if implemented, the SCS would achieve CARB's 2020 and 2035 GHG emissions reduction targets for the region.

Renewable Portfolio Standards

California's Renewable Portfolio Standard (RPS), established in 2002 by the California State Senate in SB 1078, accelerated in 2006 and expanded in 2011, is one of the most ambitious renewable energy standards in the country. The RPS requires each energy provider to supply electricity from eligible renewable energy resources to 33 percent of the total supply by 2020.

Senate Bill 350

SB 350 was signed into law in September 2015. SB 350 establishes tiered increases to the RPS of 40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. SB 350 also set a new goal to double the energy efficiency savings in electricity and natural gas through energy efficiency and conservation measures.

SB 100

SB 100 (2018) increased the standards set forth in SB 350 establishing that 44% of the total electricity sold to retail customers in California per year by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030, be secured from qualifying renewable energy sources. Under SB 100, it is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100% of the retail sales of electricity to California. This bill requires that the achievement of 100% zero-carbon electricity resources does not increase the carbon emissions elsewhere in the western grid and that the achievement not occur through resource shuffling.

SB 743

Governor Brown signed Senate Bill (SB) 743 (Steinberg, 2013), which creates a process to change the way that transportation impacts are analyzed under CEQA. Specifically, SB 743 requires OPR to amend the CEQA Guidelines to provide an alternative to LOS for evaluating transportation impacts. Particularly within areas served by transit, those alternative criteria must "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." (Public Resources Code Section 21099(b)(1).) Measurements of transportation impacts may include "vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated." (Ibid.) Once the CEQA Guidelines are amended to include those alternative criteria, auto delay will no longer be considered a significant impact under CEQA. (Id. at subd. (b)(2).) OPR recommends that a per capita or per employee vehicle miles traveled (VMT) threshold that is fifteen percent below that of existing development may be reasonable. Moreover, a fifteen percent reduction is consistent with SB 743's direction to OPR to select a threshold that will help the State achieve its climate goals.

Local

Carlsbad General Plan

The Sustainability Element and of the *Carlsbad General Plan* (City of Carlsbad 2015a) identifies goals and policies related to GHG reduction. The following goals and policies are applicable to the proposed project:

- Goal 9-G.2.** Undertake initiatives to enhance sustainability by reducing the community's GHG emissions and fostering green development patterns – including buildings, sites, and landscapes.
- Goal 9-G.3.** Promote energy efficiency and conservation in the community.
- Policy 9-P.1.** Enforce the CAP as the city's strategy to reduce GHG emissions.
- Policy 9-P.2.** Continue efforts to decrease the use of energy and fossil fuel consumption in municipal operations, including transportation, waste reduction and recycling, and efficient building design and use.

Carlsbad Climate Action Plan

The City's CAP was unanimously adopted by the City Council on September 22, 2015 (City of Carlsbad 2015c). The CAP is designed to reduce the city's GHG emissions and streamline environmental review of future development projects in the city in accordance with CEQA.

The CAP includes goals, policies, and actions for the city to reduce GHG emissions and combat climate change and includes: an inventory of citywide and local government GHG emissions; forecasts of future citywide and local government GHG emissions; a comprehensive, citywide strategy and actions to manage and reduce GHG emissions, with emission targets through 2035; and actions that demonstrate the city's commitment to achieve state GHG reduction targets by creating enforceable measures, and monitoring and reporting processes to ensure targets are met. The timeframe for the CAP extends from the date of adoption through 2035. The CAP is considered a qualified plan as described in CEQA Guidelines Section 15183.5(b).

The CAP is intended to be a tool for policy makers, community members and others to guide the implementation of actions that limit the city's GHG emissions. Ensuring that the mitigation measures in the CAP translate from policy language to on-the-ground results is critical to the success of the CAP.

As stated previously, on January 13, 2020, the City Attorney's office released a memorandum (as presented within the January 21, 2020 City Council Agenda materials) detailing that an error was found with the VMT calculation used in the CAP (City of Carlsbad 2020). The memorandum concluded that due to the VMT estimation error, the emissions forecasts for 2020 and 2035 were no longer accurate and the City may not meet the GHG targets for those years. Further, it concluded that the CAP was no longer considered a qualified GHG reduction plan under CEQA Guidelines Section 15183.5 and could not be used to tier off for determining significance.

City of Carlsbad Electric Vehicle Charging Ordinance No. CS-349

In 2011, as part of the CAP development process, the City of Carlsbad conducted analysis of citywide GHG emissions, which showed that 39% of the City's greenhouse gas emissions come from cars and trucks. In 2015, the City adopted its CAP (as discussed above), which included a goal to increase the amount of zero-emission vehicle miles traveled from 15% to 25% of total VMT by 2035. This ordinance

supports this goal by providing zero-emission vehicle parking and electric vehicle charging in new construction and major residential renovations. The measures included in this ordinance align with the requirements of the California Green Building Code and have been proven to be cost-effective when compared to a later retrofit. The ordinance took effect on April 11, 2019. Projects that meet the ordinance criteria and have not applied for a building permit by the effectiveness date will be subject to its requirements.

City of Carlsbad Water Heating Ordinance No. CS-348

The City of Carlsbad's CAP also seeks to reduce greenhouse gas emissions by promoting the installation of solar water heaters or heat pumps. In pursuit of the goals established by the CAP, the City has adopted a water-heating ordinance, which requires cost-effective water heating measures to be included on all new construction projects. Developers of all new low-rise residential construction projects need to install non-gas water heating equipment in their projects. The residential water-heating ordinance requires new low-rise residential buildings to install cost-effective water heating measures. Required measures include a water heating system that meets one of the following requirements:

- Heat pump water heater, or other form of electric water heating system, that meets California Energy Code (Title 24, Part 6) standards and is paired with a ≥ 0.3 KW (300W) photovoltaic system; or
- Solar water heating system that is OG-300 certified and includes ≥ 40 sq. ft. of collectors or provides a 0.6 solar fraction.

5.7.3 Project Impacts

Thresholds of Significance

Based on guidance provided in Appendix G of the CEQA Guidelines, a project would have a significant GHG emissions impact if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

The Appendix G thresholds for GHGs do not prescribe specific methodologies for performing an assessment, do not establish specific quantitative thresholds, and do not mandate specific mitigation measures. Rather, the CEQA Guidelines emphasize the lead agency's discretion to determine the appropriate methodologies and thresholds of significance consistent with the manner in which other impact areas are handled in CEQA (CNRA 2009a). Additional guidance regarding assessment of GHGs is discussed below.

CEQA Guidelines

With respect to GHG emissions, the CEQA Guidelines Section 15064.4(a) states that lead agencies "shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions resulting from a project. The CEQA Guidelines note that an agency has the discretion to either quantify a project's greenhouse gas emissions or rely on a "qualitative analysis or other performance based standards" (14 CCR 15064.4[a]). A lead agency may

use a “model or methodology” to estimate greenhouse gas emissions and has the discretion to select the model or methodology it considers “most appropriate to enable decision makers to intelligently take into account the project’s incremental contribution to climate change” (14 CCR 15064.4[c]). The CEQA Guidelines provide that the lead agency should consider the following when determining the significance of impacts from GHG emissions on the environment (14 CCR 15064.4[b]):

1. The extent a project may increase or reduce GHG emissions as compared to the existing environmental setting.
2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

In addition, the CEQA Guidelines specify that “[w]hen adopting or using thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence” (14 CCR 15064.7[c]).

Governor’s Office of Planning and Research Guidance

The Governor’s Office of Planning and Research technical advisory titled, CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review, states that “public agencies are encouraged but not required to adopt thresholds of significance for environmental impacts. Even in the absence of clearly defined thresholds for GHG emissions, the law requires that such emissions from CEQA projects must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact” (OPR 2008). Furthermore, the advisory document indicates that “in the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a ‘significant impact,’ individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice” (OPR 2008).

Cumulative Nature of Climate Change

Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHGs. There are currently no established thresholds for assessing whether the GHG emissions of a project in the SDAB, such as the proposed project, would be considered a cumulatively considerable contribution to global climate change; however, all reasonable efforts should be made to minimize a project’s contribution to global climate change.

While the proposed project would result in emissions of GHGs during construction and operation, no current guidance exists to indicate what level of GHG emissions would be considered substantial enough to result in a significant adverse impact on global climate. However, it is generally believed that an individual project is of insufficient magnitude by itself to directly influence climate change scientific uncertainty regarding the significance a project’s individual and cumulative effects on global climate change remains.

Thus, GHG impacts are recognized as exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective (CAPCOA 2008). This approach is consistent with that recommended by the CNRA, which noted in its Public Notice for the proposed

CEQA amendments (pursuant to SB97) that the evidence before it indicates that in most cases, the impact of GHG emissions should be considered in the context of a cumulative impact, rather than a project-level impact (CNRA 2009a). Similarly, the Final Statement of Reasons for Regulatory Action on the CEQA Amendments confirm that an environmental impact report or other environmental document must analyze the incremental contribution of a project to GHG levels and determine whether those emissions are cumulatively considerable (CNRA 2009b).

Approaches to Determining Significance

Neither the State of California nor the SDAPCD has adopted quantitative emission-based thresholds of significance for GHG emissions under CEQA. In the absence of an adopted numeric threshold, the significance of the project's GHG emissions will be evaluated consistent with CEQA Guidelines Section 15064.4(b) by considering whether the project complies with applicable plans, policies, regulations, and requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

The plans, policies, regulations and requirements that are considered in this analysis include:

- CARB's Scoping Plan and actions taken in furtherance of its objectives to achieve identified near-term (2020), mid-term (2030) and long-term (2045/2050) targets for the reduction of GHG emissions; and,
- Those adopted in furtherance of SB 375, and specifically SANDAG's Regional Plan.

Efficiency Metric Threshold

In addition, the proposed project will be evaluated against a City-specific efficiency metric threshold based on the City's 2012 GHG inventory (City of Carlsbad 2020). An efficiency metric is calculated by dividing the allowable GHG emissions inventory in a selected calendar year by the service population (residents plus employees), which then leads to the identification of a quantity of emissions that can be permitted on a per service population basis without significantly impacting the environment. This approach focuses on the overall GHG efficiency of a project relative to regulatory GHG reduction goals.

Under the efficiency metric threshold, the proposed project's GHG emissions are evaluated relative to the emissions level in the proposed project's build-out year and the build-out year's associated efficiency metric. To that end, an efficiency metric was calculated based on the 2025 emissions level (the year of project build-out) and the project's service population (sum of number of employees and the number of residents provided by the project).

As there are no jurisdictional/City-based emissions data specific to the proposed project's build-out year (2025), an efficiency metric threshold was generated for year 2025 by interpolating the City-based emission targets for years 2020 and 2030. The efficiency metric threshold is first calculated for 2020, so as to establish the benchmark for compliance with AB 32's 2020 reduction target (a return to 1990 levels). The 2030 emissions reduction goal was based on the SB 32 goal to reduce GHG emissions to 40 percent below 1990 levels by 2030. It should be noted that the downward trajectory from AB 32 to SB 32 is greater than that from AB 32 to EO S-3-05 of 80% below 1990 by 2050 (CARB 2017). By analyzing the project against the quantitative efficiency metric thresholds for the buildout year and for the milestone year for the next legislatively adopted target (2030), this analysis demonstrates that the project would demonstrate progress towards, and be on the trajectory towards helping the state comply with its long-term targets in EO S-3-05. Developing community-wide mass reduction goals using this approach is consistent with CARB (2017, pp. 100–101) recommendations

to determine the targets “based on local emissions sectors” and to “develop community-wide GHG emissions reduction goals necessary to reach 2030 and 2050 climate goals.”

To develop the 2020 efficiency metric threshold, the emissions target from AB 32 was used for year 2020 (a return to 1990 emission levels). The 2020 statewide emissions target is 4% below the 2012 statewide emissions (see Recirculated Draft EIR Appendix B for more details). Therefore, the 2020 emissions target for the project would be 4% below the 2012 inventory of 977,000 MT CO₂e (or 933,353 MT CO₂e) (the percentage reductions have been rounded for presentation purposes, see Appendix A provided in Recirculated Draft EIR Appendix B for detailed calculations). To develop the service population for that year, the SANDAG Series 13 Regional Growth Forecast was relied upon for the forecasted population and employment.

To develop the 2030 efficiency metric threshold, the emissions target from SB 32 was used for year 2030 (to reduce GHG emissions to 40 percent below 1990 levels by 2030). The 2030 statewide emissions target is 42% below the 2012 statewide emissions (see Recirculated Draft EIR Appendix B for more details). Therefore, the 2030 emissions target for the project would be 42% below the 2012 inventory of 977,000 MT CO₂e (or 560,012 MT CO₂e). To develop the service population for that year, the SANDAG Series 13 Regional Growth Forecast was relied upon for the forecasted population and employment.

To develop the 2025 efficiency metric threshold, it is necessary to interpolate the emissions target between the 2020 and 2030 forecasted emissions. To develop the efficiency metric threshold for 2025, the City’s forecasted emissions in 2020 were reduced by 5.2% per year through 2030, which is consistent with the CARB’s Scoping Plan target for SB 32 (CARB 2015).

Table 5.7-4 shows the estimated GHG emissions target for 2025 based on the Scoping Plan’s downward trajectory to meet the SB 32 target.

Table 5.7-4. City of Carlsbad Emissions Target

	2020	2025	2030
Emissions (MT CO ₂ e)	933,353	722,972	560,012

Source: Appendix B of this Recirculated Draft EIR

Notes:

The 2020 and 2030 City-wide emissions targets were based on meeting the Statewide reduction goals of AB 32 and SB 32, respectively.

The 2025 emissions target was based on the Scoping Plans downward trajectory of 5.2% per year to meet the goals of SB 32.

The efficiency metric thresholds for 2020, 2025, and 2030 are illustrated below in Table 5.7-5. If the proposed project achieves the 2025 efficiency metric threshold, the proposed project would not interfere with the State’s ability to achieve the GHG reduction targets per SB 32 and would demonstrate progress toward attaining 2050 targets per EO S-3-05.

Table 5.7-5. City of Carlsbad 2020, 2025, and 2030 Efficiency Metric Threshold

	Population ¹	Employment ¹	Service Population (Population + Employment)	Emissions Target (MT CO ₂ e)	Efficiency Metric Threshold (MT/SP/yr)
2020 ²	118,450	77,422	195,872	933,353	4.77
2025 ³	121,000	79,877	200,877	722,972	3.60
2030 ⁴	122,899	82,175	205,074	560,012	2.73

Source: Appendix B of this Recirculated Draft EIR

Notes:

¹ SANDAG 2050 Regional Growth Forecast, Series 13 (SANDAG 2013).

² Emissions for 2020 are based on the 2012 City of Carlsbad GHG Inventory and GHG reduction goals consistent with AB 32.

³ Emissions for 2025 are based on the Scoping Plan's downward trajectory to meet the SB 32 target in 2030.

⁴ Emissions for 2030 are based on the 2012 City of Carlsbad GHG Inventory and GHG reduction goals consistent with SB 32.

CO₂e = carbon dioxide equivalent; MT = metric ton; SP = service population; yr = year.

As shown in Table 5.7-5, the calculated efficiency metric threshold for 2025 based on the City's 2012 GHG emissions and the statewide emissions reduction trajectory is 3.60 MT/SP/yr. This 2025 efficiency metric threshold reflects the trajectory planned for in the State's Scoping Plan. If the proposed project achieves the 2025 efficiency metric threshold, it would not interfere with attainment of the 2030 and 2050 statewide emission reduction targets, and therefore not interfere with the State's and the City's ability to achieve the mid-term and long-term GHG reduction targets.

Service Population

Based on a residential density of 2.59 persons per household found within the SANDAG Series 13 Growth Forecast for the City, the proposed project would have a residential population of 772 (2.59 persons per household X 298 units) (SANDAG 2013). The project applicant estimates that 25 people will be employed in the restaurant and retail land uses. Therefore, the proposed project would have a total service population of 797 persons.

5.7.4 Approach and Methodology

This analysis assumes that the GWP for CH₄ is 25 and the GWP for N₂O is 298, based on the IPCC Fourth Assessment Report (IPCC 2007) (see Section 3.1.3 Recirculated Draft EIR Appendix B).

Construction

CalEEMod Version 2016.3.2 was used to estimate potential project-generated GHG emissions during construction. Construction of the proposed project would result in GHG emissions primarily associated with use of off-road construction equipment, on-road hauling and vendor (material delivery) trucks, and worker vehicles. All details for construction criteria air pollutants discussed in Recirculated Draft EIR Appendix B -Section 2.4.2.1, are also applicable for the estimation of construction-related GHG emissions. Refer to Recirculated Draft EIR Appendix B for a discussion of construction emissions calculation methodology and assumptions.

Carbon Sequestration (Loss)

This GHG analysis estimates the loss of sequestered carbon associated with the proposed land use change under the construction impact analysis. The gain of sequestered carbon associated with planting new trees is evaluated under the operational impact analysis discussed later in this section.

The calculation methodology and default values provided in the CalEEMod Version 2016.3.2, User's Guide (CAPCOA 2017) was used to calculate potential CO₂ emissions associated with the one-time change in carbon sequestration capacity of a vegetation land use type. The calculation of the one-time loss of sequestered carbon is the product of the converted acreage value and the carbon content value for each land use type (vegetation community). The mass of sequestered carbon per unit area (expressed in units of MT of CO₂ per acre) is dependent on the specific land use type. Assuming that the sequestered carbon is released as CO₂ after removal of the vegetation, annual CO₂ is calculated by multiplying total biomass (MT of dry matter per acre) from IPCC data by the carbon fraction in plant material, and then converts MT of carbon to MT of CO₂ based on the molecular weights of carbon and CO₂ (IPCC 2014).

It is assumed that all sequestered carbon from the removed vegetation will be returned to the atmosphere; that is, the wood from the trees and vegetation communities would not be re-used in a solid form or another form that would retain carbon. GHG emissions generated during construction activities, including clearing, tree removal, and grading, were included in the construction GHG emissions calculations.

Operation

CalEEMod Version 2016.3.2 was used to estimate potential project-generated operational GHG emissions from area sources (landscape maintenance), energy sources (natural gas and electricity), mobile sources, solid waste, and water supply and wastewater treatment. Emissions from each category are discussed in the following text with respect to the project. For additional details, see Recirculated Draft EIR Appendix B, Section 2.4.2.2, Operation, for a discussion of operational emission calculation methodology and assumptions, specifically for area, energy (natural gas), and mobile sources. Operational year 2025 was assumed as it is the first full year of operation following completion of construction.

Energy Sources

As represented in CalEEMod, energy sources include GHG emissions associated with building electricity and natural gas usage (non-hearth).

CalEEMod default values for energy consumption for each land use were applied for the project analysis. The energy use from residential land uses is calculated in CalEEMod based on the California Residential End-Use Survey database. The program uses data collected during the Residential Appliance Saturation Survey to develop energy intensity values (electricity and natural gas usage per square foot per year) for residential buildings. To account for the use of electric water heaters, the default energy use in CalEEMod was revised based on the typical annual fuel utilization efficiencies of electric and natural gas water heaters and the portion of water heater natural gas use within a building (US Department of Energy 2020). Energy use in buildings (both natural gas and electricity) is divided by the program into end use categories subject to Title 24 requirements (end uses associated with the building envelope, such as the HVAC system, water heating system, and integrated lighting)

and those not subject to Title 24 requirements (such as appliances, electronics, and miscellaneous “plug-in” uses).

Title 24 of the California Code of Regulations serves to enhance and regulate California’s building standards. The most recent amendments to Title 24, Part 6, referred to as the 2016 standards, became effective on January 1, 2017. The 2019 Title 24 standards will take effect on January 1, 2020. Therefore, the proposed project would be subject to the 2019 Title 24 standards. However, CalEEMod’s default values for energy consumption are based on compliance with the 2016 Title 24 standards. No adjustments were made in accordance with the 2019 Title 24 code and thus the energy use provided herein is considered conservative.

In general, single-family residences built to the 2019 standards are anticipated to use approximately 7 percent less energy due to energy efficiency measures than those built to the 2016 standards; once rooftop solar electricity generation is factored in, single-family residences built under the 2019 standards will use approximately 53 percent less energy than those under the 2016 standards (CEC 2018b). Nonresidential buildings built to the 2019 standards are anticipated to use an estimated 30 percent less energy than those built to the 2016 standards (CEC 2018b).

Annual natural gas (non-hearth) and electricity emissions were estimated in CalEEMod using the emissions factors for San Diego Gas and Electric (SDG&E), which would be the energy source provider for the project. For operational year 2025, the emission factors for SDG&E were adjusted to reflect SDG&E’s compliance with the RPS standards, which is based on the renewable procurement percentage of 44% from the 2017 SDG&E RPS submittal (CEC 2018).

The project will incorporate solar photovoltaic panels on site for both the residential and commercial components. The residential units will include a solar photovoltaic system in accordance with 2019 Title 24 requirements (which requires residential developments to offset their entire electricity demand through solar photovoltaic), totaling 554 kW. The commercial component of the project will include at a minimum a 15 kW solar photovoltaic system in accordance with City Ordinance CS-347. The project will also include Energy Star appliances and at least 75% light emitting diode lighting fixtures for interior and exterior. The project will include electric water heaters in accordance with City Ordinance CS-347 and CS-348. All residential unit garages will be equipped to be electric vehicle (EV) Ready¹ and the commercial component will include at least four EV Capable² parking spaces and would also include two EV charging stations for public use in accordance with City Ordinance CS-349. The EV Ready, EV Capable, and EV charging stations were not accounted for in the modeling.

Solid Waste

The project would generate solid waste and would, therefore, result in CO_{2e} emissions associated with landfill off-gassing. Solid waste generation was derived from the CalEEMod default rates for each land use type. Emission estimates associated with solid waste were estimated using CalEEMod. A solid waste diversion rate of 50% was assumed in accordance with AB 341.

¹ EV Ready means a parking space that is pre-wired with a dedicated 208/240 branch circuit installed in conduit that originates at the electrical service panel or sub-panel and 40 ampere minimum overcurrent protection device, and terminates into a cabinet, box or enclosure, in a manner approved by the building official (City of Carlsbad 2017a).

² EV Capable means a parking space that has a cabinet, box or enclosure connected to a conduit linking the parking space to the electrical service panel in a manner approved by the building official. The electrical service panel shall provide sufficient capacity to simultaneously charge all electric vehicles with or without a load management system (City of Carlsbad 2017a).

Water Supply and Wastewater

Water supplied to the project requires the use of electricity. Accordingly, the supply, conveyance, treatment, and distribution of water would indirectly result in GHG emissions through use of electricity. Annual water use for the project and GHG emissions associated with the electricity used for water supply were calculated based upon default water use estimates for each land-use type, as estimated by CalEEMod and San Diego Gas and Electric factors. The project would include low-flow fixtures in all buildings and use non-potable water for irrigation of the landscaping. Additional reclaimed water will be available for the project to use, but as a conservative measure, it was only assumed to be used for the parks and greenbelts. These features were accounted for in the modeling.

Impact Analysis

Impact 5.7-1 Generate Significant Levels of Greenhouse Gases

- *Would the proposed project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?*
- *Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?*

Construction

Construction of the proposed project would result in GHG emissions primarily associated with use of off-road construction equipment, on-road hauling and vendor (material delivery) trucks, and worker vehicles.

GHG emissions associated with temporary construction activity were quantified using CalEEMod (Version 2016.3.2). For the purposes of modeling, it was assumed that construction of the proposed project would last approximately 39 months. A detailed description of the construction schedule, including information regarding phasing, equipment used during each phase, haul trucks, vendor trucks, and worker vehicles is included in the *Air Quality and Greenhouse Gas Emissions Analysis Technical Report* prepared for the project (Appendix B of this Recirculated Draft EIR).

Table 5.7-6 shows the estimated annual GHG construction emissions associated with the proposed project. As shown in Table 5.7-6, construction of the proposed project would generate 1,073 MTCO_{2e}. When amortized over the life of the project (over 30 years), the yearly contribution to GHG from the aggregate of construction at the project site would be 36 MTCO_{2e} per year. However, because there is no separate GHG threshold for construction emissions alone, the evaluation of significance is discussed in the operational emissions analysis below.

Table 5.7-6. Estimated Annual Construction Greenhouse Gas Emissions

Year	Pollutant Emissions (metric tons/year)			
	CO ₂	CH ₄	N ₂ O	CO ₂ e
2021	910.15	0.20	0.00	915.20
2022	75.51	0.01	0.00	75.68
2023	74.24	0.01	0.00	74.41
2024	7.64	0.00	0.00	7.68
Total				1,072.97
Amortized Emissions				35.77

Source: Appendix B of this Recirculated Draft EIR

Notes:

CO₂=carbon dioxide; CH₄=methane; N₂O=nitrous dioxide; CO₂e=carbon dioxide equivalent

The loss of sequestered carbon from the removal of 2.1 acres of ornamental/non-native vegetation is estimated based on the carbon content estimate of the vegetation over the growth period (MT CO₂ per tree) (HELIX Environmental Planning, Inc. 2018). The loss of sequestered carbon is presented in Table 5.7-7.

Table 5.7-7. Planted Trees Sequestered Carbon

Tree Species	Growing Period (years)	Sequestration Rate (MT CO ₂ /acre/year)	Quantity of Vegetation Removed (acres)	Sequestered Carbon (MT CO ₂)
Grassland	20	4.31	2.1	181.02

Source: Appendix B of this Recirculated Draft EIR

Notes:

MT CO₂=metric tons carbon dioxide.

As presented in Table 5.7-7, the removal of 2.1 acres of ornamental/non-native vegetation would result in the release of approximately 181 MT CO₂. Including the construction emissions in Table 5.7-6, the total estimated GHG emissions from the construction of the project would be 1,254 MT CO₂e. The construction and loss of sequestered carbon emissions amortized over 30 years would be 41.80 MT CO₂e per year.

Operation

Operation of the proposed project would generate GHG emissions through motor vehicle trips to and from the project site; landscape maintenance equipment operation; energy use (natural gas and generation of electricity consumed by the proposed project); solid waste disposal; and generation of electricity associated with water supply, treatment, and distribution and wastewater treatment.

The estimated operational (Year 2025) project-generated GHG emissions from area sources, energy usage, motor vehicles, solid waste generation, and water usage and wastewater generation are shown in Table 5.7-8. As shown in Table 5.7-8, in 2025, estimated annual GHG emissions would be approximately 1,932 MT CO₂e as a result of project operations.

Table 5.7-8. Estimated Annual Operational Greenhouse Gas Emissions

Emission Source	Pollutant Emissions (Metric Tons/year)			
	CO ₂	CH ₄	N ₂ O	CO ₂ e
Area	3.62	0.00	0.00	3.70
Energy	201.85	0.01	0.00	202.91
Mobile	1,603.17	0.08	0.00	1,605.21
Solid waste	21.05	1.24	0.00	52.14
Water supply and wastewater	49.99	0.55	0.01	67.75
Total Operational Emissions				1,931.72
Amortized Construction Emissions				41.80
Operation + Amortized Construction Total				1,973.52

Source: Appendix B of this Recirculated Draft EIR

Notes:

CO₂=carbon dioxide; CH₄=methane; N₂O=nitrous dioxide; CO₂e=carbon dioxide equivalent

These emissions reflect California Emissions Estimator Model “mitigated” output and operational year 2025 including high efficiency lighting, solar photovoltaics, increased diversity, increased transit accessibility, and below market-rate housing.

Summary of Total Greenhouse Gas Emissions

As shown in Table 5.7-8 estimated annual project-generated GHG emissions in 2025 from area, energy, mobile, solid waste, and water/wastewater sources and amortized project construction emissions would be approximately 1,932 MTCO₂e. Estimated annual project-generated emissions in 2025 from area, energy, mobile, solid waste, and water/wastewater sources and amortized project construction emissions would be approximately 1,974 MT CO₂e per year.

The gain of sequestered carbon resulting from planting and growth of approximately 1,382 trees of various species on site is estimated based on the carbon sequestration rate for the tree species, the number of new trees, and the growing period. It is assumed that all trees will grow for a minimum of 20 years. Table 5.7-9 presents the estimated one-time carbon-stock change resulting from proposed planting of new trees.

Table 5.7-9. Planted Trees Sequestered Carbon

Tree Species	Growing Period (years)	Sequestration Rate (MT CO ₂ /tree/year)	Quantity of New Tree Plantings (trees)	Sequestered Carbon (MT CO ₂)
Miscellaneous	20	0.0354	1,382	978.46

Source: Appendix B of this Recirculated Draft EIR

Notes: MT CO₂ = metric tons carbon dioxide.

See Appendix B for calculations and sources.

As presented in Table 5.7-9, the gain in sequestered carbon resulting from planting 1,382 trees would be approximately 979 MT CO₂, or 48.92 MT CO₂ per year. Including the sequestered carbon from planted trees, the estimated annual project-generated GHG emissions would be approximately 1,925 MT CO₂e per year as a result of project operation.

The project's impact will be assessed based on its consistency with applicable GHG reduction plans, rules, and laws set forth locally, regionally, and statewide. The project's sustainable attributes will be evaluated against these criteria, and, as such, are provided in detail below:

- The project would add important housing stock to an infill location close to existing employment and commercial centers.
 - As background, SANDAG's Series 13 Regional Growth Forecast projected that the City of Carlsbad would have 48,448 housing units and 77,422 jobs in 2020, for a jobs/housing ratio of 1.60 (SANDAG 2013). As such, the City needs additional housing units (including affordable units) to balance its employment-generating land uses. By providing increased residential opportunities within the City, the proposed project would help the City to reduce the trip lengths traveled by employees to their work destinations in Carlsbad. This was not included in the modeling.
- The project would reduce the consumption of natural gas and promote building electrification through a number of design features. These items were included in the modeling and discussed more in detail in Sections 2.4.2.2 and 3.4.2.2 of Recirculated Draft EIR Appendix B.
 - The project would not include fireplaces or woodstoves.
 - The project would use electric-based water heating.
 - The project would be designed to include a solar PV rooftop system for the residences that would be rated at 554-kW direct current. This system is estimated to generate up to 902,487 kWh per year (NREL 2017). The commercial area would have a 15-kW solar PV system that is estimated to generate up to 24,591 kWh per year.
- The project would incorporate additional efficiencies in the built environment relating to the consumption of transportation fuels, energy, and water.
 - All residential unit garages will be equipped to be EV Ready and the commercial component will include at least four EV Capable parking space and would also include two EV charging stations for public use. This was not accounted for in the modeling.
 - The project would include Energy Star appliances. This was accounted for in the modeling and discussed in Section 3.4.2.2 of the Recirculated Draft EIR Appendix B.
 - The project would include use of LED lighting or other efficient lighting for at least 75% of the total luminaires. This was accounted for in the modeling and discussed in Section 3.4.2.2 of the Recirculated Draft EIR Appendix B.
 - The project would include low-flow or high-efficiency water fixtures (toilet, showerhead, clothes washer, etc.). This was accounted for in the modeling and discussed in Section 3.4.2.2 of the Recirculated Draft EIR Appendix B.

As shown previously, the total operational emissions for the project would be approximately 1,925 MT CO₂e per year, including amortized construction emissions. The efficiency metric threshold for the project's buildout year was calculated at 3.60 MT CO₂e/person/year. The project would have an efficiency metric of 2.42 MT CO₂e/person/year (1,925 MT CO₂e per year / 797 persons). Therefore, the project would not exceed the efficiency metric threshold for 2025, and thus would be consistent with the state's targets within SB 32 for 2030. Furthermore, the project would also have a lower efficiency metric than the threshold for 2030 (2.73 MT CO₂e/person/year), five years beyond the project's anticipated buildout year.

Consistency with CARB's Scoping Plan

The Scoping Plan, approved by CARB on December 12, 2008, provides a framework for actions to reduce California's GHG emissions and requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. As such, the Scoping Plan is not directly applicable to specific projects. Relatedly, in the Final Statement of Reasons for the Amendments to the CEQA Guidelines, the CNRA observed that "[t]he [Scoping Plan] may not be appropriate for use in determining the significance of individual projects because it is conceptual at this stage and relies on the future development of regulations to implement the strategies identified in the Scoping Plan" (CNRA 2009a). Under the Scoping Plan, however, there are several state regulatory measures aimed at the identification and reduction of GHG emissions. CARB and other state agencies have adopted many of the measures identified in the Scoping Plan. Most of these measures focus on area source emissions (e.g., energy usage, high-GWP GHGs in consumer products) and changes to the vehicle fleet (i.e., hybrid, electric, and more fuel-efficient vehicles) and associated fuels (e.g., low-carbon fuel standard), among others. The project would comply with all applicable regulations adopted in furtherance of the Scoping Plan to the extent required by law.

The Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of AB 32 and establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions.

Table 21 Project Consistency with Scoping Plan GHG Emission-Reduction Strategies (see Recirculated Draft EIR Appendix B), highlights measures that have been developed under the Scoping Plan and provides a summary of the proposed project's consistency with Scoping Plan measures. The table also identifies applicable measures included in the 2017 Scoping Plan Update. The Plan is a package of economically viable and technologically feasible actions to not just keep California on track to achieve its 2030 target, but stay on track for a low- to zero-carbon economy by involving every part of the state (CARB 2017). As provided in Table 21 (Recirculated Draft EIR Appendix B), to the extent that these regulations are applicable to the proposed project, its inhabitants, or uses, the proposed project would comply with all applicable regulations adopted in furtherance of the Scoping Plan. Based on the analysis provided in this table, the proposed project would be consistent with the applicable strategies and measures in the Scoping Plan.

In addition to the measures outlined in Table 21 (Recirculated Draft EIR Appendix B), the Scoping Plan also highlights, in several areas, the goals and importance of infill projects. Specifically, the Scoping Plan calls out an ongoing and proposed measure to streamline CEQA compliance and other barriers to infill development. The plan encourages infill projects and sees them as crucial to achieving the State's long-term climate goals. The plan encourages accelerating equitable and affordable infill development through enhanced financing and policy incentives and mechanisms.

The State completed an Integrated Natural and Working Lands Climate Change Action Plan in 2018, which considered aggregation of eco-regional plans and efforts to achieve net sequestration goals. The Action Plan includes goals and plans to promote and provide incentives for infill development through community revitalization and urban greening and promote the adoption of regional transportation and development plans, such as SB 375, Sustainable Communities Strategies and Climate Action Plans, that prioritize infill and compact development and also consider the climate change impacts of land use and management.

The following strategies were outlined to expand infill development within the 2017 Scoping Plan:

- Encouraging regional Transfer of Development Rights programs to allow owners of natural and working lands to sell their development rights to developers who can use those rights to add additional density to development projects in preferred infill areas.
- Promoting regional Transit-Oriented Development funds that leverage public resources with private-sector investment capital to provide flexible capital for Transit-Oriented Development projects.
- Rebates for low-VMT/location-efficient housing, similar to programs that use rebates to encourage adoption of energy-efficient appliances, ZEVs, water-efficient yards, or renewable energy installation. For example, the rebate could reimburse residents for a portion of the down payment for purchasing or renting a qualified home in exchange for a minimum term of residence.
- Promotion of cross-subsidizing multi-station financing districts along transit corridors to leverage revenues from development in strong-market station areas in order to seed needed infrastructure and development in weaker-market station areas.
- Abatement of residential property tax increases in exchange for property-based improvements in distressed infill areas.
- Ways to promote reduced parking in areas where viable transportation alternatives are present.
- Additional creative financing mechanisms to enhance the viability of priority infill projects.
- Ways to promote and strengthen Urban Growth Boundaries to promote infill development and conservation of natural and working lands by defining and limiting developable land within a metropolitan area according to projected growth needs.

In summary, the proposed project would be consistent with the measures and policy goals as shown in Table 21 (Recirculated Draft EIR Appendix B). The proposed project would also be consistent with the various efforts the Scoping Plan established to encourage infill development projects. Therefore, the proposed project would be consistent with CARB's 2017 Scoping Plan.

In addition to the statewide measures presented in Table 21 (Recirculated Draft EIR Appendix B), the 2017 Scoping Plan presented a suite of local actions that agencies can take to reduce GHG emissions, as found within Appendix B of the 2017 Scoping Plan (CARB 2017). The project's consistency with the Scoping Plan local actions is presented in Table 22 of Recirculated Draft EIR Appendix B. As provided in Table 22 (Recirculated Draft EIR Appendix B), the project would be consistent with all applicable Local Actions within Appendix B of the Scoping Plan.

Consistency with Applicable GHG-Related Laws and Regulations

The project's consistency with statewide GHG reduction strategies is summarized in detail in Table 23 – Applicable Greenhouse Gas-Related Laws and Regulations, provided in Recirculated Draft EIR Appendix B. As shown, the project would be consistent with and would not conflict with the applicable GHG-reducing strategies of the state.

Consistency with SANDAG's San Diego Forward: the Regional Plan

SANDAG's Regional Plan is a regional growth-management strategy that targets per-capita GHG reduction from passenger vehicles and light-duty trucks in the San Diego region. The Regional Plan will integrate land use and transportation strategies to meet GHG emissions reduction targets that are forecasted to achieve the state's 2035 and 2050 GHG reduction goals. The State's targets for San Diego County are a 7% reduction per capita in GHG emissions by 2020 compared to 2005 and a 13% reduction by 2035. The 2050 RTP would exceed the 2020 and 2035 reduction goals (SANDAG 2015).

Regarding consistency with SANDAG's Regional Plan, the proposed project would include site design elements and project design features developed to support the policy objectives of the RTP and SB 375. The convenient availability of walking and bicycling trails and parks (including the Laguna Riviera City Park and trail) that are accessible for use by residents will serve to reduce VMT. Finally, because the proposed project is an infill project, it would have inherently fewer VMT than a project located at the outskirts of a city. Implementation of the proposed project would result in an increase in 298 residential units. The most recent Regional Housing Needs Assessment from SANDAG stated that Carlsbad needs to build 430 units per year from 2021 through 2029 (SANDAG 2019). Furthermore, the City projected a deficit of 1,062 very-low and low income units and 238 moderate and above moderate income units (City of Carlsbad 2019a). The proposed project is expected to bring 298 units to market in 2025, of which 46 will be affordable.

Table 24 San Diego Forward: The Regional Plan Consistency Analysis (see Recirculated Draft EIR Appendix B) illustrates the proposed project's consistency with all applicable goals and policies of *San Diego Forward: The Regional Plan* (SANDAG 2015). As shown in Table 24 (Recirculated Draft EIR Appendix B), the proposed project is consistent with all applicable Regional Plan Policy Objectives or Strategies. SANDAG worked with the local jurisdictions to identify Regional Housing Needs Assessment allocation options that meet the four goals of housing element law (Government Code Section 65484(d)(1)-(4)) within the Regional Plan. The second of the four objectives of the SANDAG Regional Housing Needs Assessment is to promote infill development and socioeconomic equity, the protection of environmental and agricultural resources, and the encouragement of efficient development patterns. Also, one of the key achievements projected for the Regional Plan is for nearly three-quarters of multi-family housing to be built on redevelopment or infill sites. The proposed project would be consistent with that goal as it would be developed on an infill site.

In summary, the proposed project promotes a pedestrian experience for the project's residents and visitors that facilitates non-vehicular travel, consistent with SB 375 and SANDAG's Regional Plan. As shown in Table 24 (Recirculated Draft EIR Appendix B), the proposed project would be consistent with policy objectives of SANDAG's Regional Plan. Impacts would be less than significant.

Conclusion

The proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. Rather, the proposed project is consistent with many of the sustainable communities' strategies for land use development that encourage alternative modes of transportation and walkability. The proposed project's impact is less than significant.

5.7.5 Level of Significance before Mitigation

Implementation of the proposed project would not result in a significant impact on GHG/climate change; therefore, no mitigation measures are proposed.

5.7.6 Environmental Mitigation Measures

No mitigation measures are proposed.

5.7.7 Level of Significance after Mitigation

No significant impacts on GHG/climate change have been identified.



5.14 Transportation/Circulation

The following chapter replaces previously circulated Draft EIR Section 5.14. The CEQA analysis as it relates to roadway and intersection LOS has been replaced with the now required VMT analysis. Additionally, the GMP and MMLOS performance standard analysis has been removed as explained in Section 1.0 of this Recirculated Draft EIR.

This section summarizes the proposed project's impacts to transportation and circulation within the vicinity of the project site as a result of implementation of the proposed project.

The following technical study analyzes the potential impacts from the proposed project:

- *Vehicles Miles Traveled Analysis Marja Acres* (Linscott Law & Greenspan Engineers 2020) (Appendix J of this Recirculated Draft EIR)

The technical appendices are included on the attached CD found on the back cover of this Recirculated Draft EIR and are available for review online at the following City of Carlsbad website address: <http://www.carlsbadca.gov/services/depts/planning/agendas.asp>.

5.14.1 Existing Conditions

The project site is currently developed with 12,370 square feet of commercial uses including small commercial shops, a nursery, and restaurant. A residence is located on the southern parcel of the site. Approximately 700 average daily traffic (ADT) is generated by these existing uses at the project site.

Vehicle Miles Traveled Background

Vehicle Miles Traveled (VMT) is defined as the "amount and distance of automobile travel attributable to a project" per CEQA Guidelines Section 15064.3. VMT is a measure of the use and efficiency of the transportation network as well land uses in a region. VMTs are calculated based on individual vehicle trips generated and their associated trip lengths. VMT accounts for two-way (roundtrip) travel and is estimated for a typical weekday for the purposes of measuring transportation impacts.

For mixed -use (but primarily residential) projects like the Marja Acres Project, "VMT per capita" is the efficiency metric used for evaluation. VMT per capita is defined as the total daily miles of vehicle travel divided by the total population. VMT per capita as used in the VMT study for the proposed project are calculated for both the City of Carlsbad (City wide VMT), and the project (Project VMT). The VMT per capita reviewed in the SANDAG model and analysis is "tour -based" VMT, which represents the collective distance traveled in a home--to--home trip. For example, a trip from home, to a coffee shop, to work, then to lunch and back, then from work to the gym then home in a day would represent a "tour."

Existing Transit Conditions

The project site is currently served by North County Transit District (NCTD) bus service along Route 309 and 323. Route 309 provides service from Oceanside to Encinitas via El Camino Real. Route 323 provides service from College Boulevard (the Sprinter Station) to Quarry Creek, and includes additional stops for Carlsbad High School and Sage Creek High School on school days during the regular school year. The nearest stops to the project site for both Route 309 and Route 323 are located on El Camino Real at Kelly Drive and at West Ranch Road/Lisa Street.

Existing Non-Motorized Conditions

Non-motorized transportation facilities include bicycle trails, pedestrian sidewalks, and unpaved trail networks. Sidewalks are included throughout the roadway network within the immediate project area. Bicycle facilities are typically identified as Class I (shared use or bike path; physically separated from any street), Class II (bike lane; portion of roadway designated by striping or signage), or Class III (bike route; any road, street, path specifically designated for bicycle travel regardless of whether such facilities are designated for the exclusive use of bicycles or shared with other transportation modes). The following bike lanes currently exist within the immediate area:

- El Camino Real (Class II)
- Tamarack Avenue (Class II)
- Kelly Drive (Class II)
- Cannon Road (Class II)

5.14.2 Regulatory Setting

State

California Department of Transportation

Caltrans is the primary state agency responsible for transportation issues. One of its duties is the construction and maintenance of the state highway system. Caltrans has established standards for street traffic flow and has developed procedures to determine if intersections require improvements. For projects that may physically affect facilities under its administration, Caltrans requires encroachment permits before any construction work may be undertaken. For projects that would not physically affect facilities, but may influence traffic flow and levels of services at such facilities, these potential impacts to Caltrans facilities would need to be analyzed in accordance with Caltrans protocol, and Caltrans may recommend measures to mitigate the traffic impacts of such projects.

Senate Bill 743

In September 2013, the Governor's Office signed SB 743 into law, starting a process that fundamentally changes the way transportation impact analysis is conducted under CEQA. Within the State's CEQA Guidelines, these changes include the elimination of Auto Delay, level of service (LOS), and similar measurements of vehicular roadway capacity and traffic congestion as the basis for determining significant impacts. The guidance identifies VMT as the most appropriate CEQA transportation metric, along with the elimination of Auto Delay/LOS for CEQA purposes statewide. The justification for this paradigm shift is that Auto Delay/LOS impacts lead to improvements that increase roadway capacity and therefore induce more traffic and greenhouse gas emissions. The legislation was also intended to incentivize development in and around Transit Priority Areas (TPAs) and HQTCS, and to encourage high density infill and mixed-use projects.

In January 2016, the Governor's Office of Planning and Research (OPR) issued Draft Guidance, which provided recommendations for updating the State's CEQA Guidelines in response to SB 743 and recommended practice for VMT analysis in an accompanying *Technical Advisory on Evaluating Transportation Impacts in CEQA* (Technical Advisory). OPR's most recent Technical Advisory is dated December 2018 and is cited as a leading source of the thresholds and methodology contained in the City's Draft Guidelines.



Regional

San Diego Association of Governments – Regional Transportation Plan

SANDAG is the regional transportation planning agency in San Diego County. As such, they are responsible for planning and funding transportation projects throughout the region. SANDAG has completed its 2050 RTP. The RTP was adopted on October 28, 2011. The RTP identifies a potential future project that would provide peak period bus rapid transit on I-5 and along an east-west corridor in the vicinity of Palomar Airport Road.

Local

Vehicle Miles Traveled

A VMT Analysis (Recirculated Draft EIR Appendix J) has been prepared to determine the impacts on VMT for the project. This VMT analysis has been prepared based on guidance from the City, utilizing methodologies presented in the City's Draft *Vehicle Miles Traveled (VMT) Analysis Guidelines* (March 27, 2020). These methodologies have been created to assist with implementation of SB 743 discussed above, SB 743 resulted in a shift in the measure of effectiveness for determining transportation impacts from Level of Service (LOS) and vehicular delay to VMT. VMT analyses are required for use in all California Environmental Quality Act (CEQA) documents no later than July 1, 2020.

Consistent with the city's draft guidelines, the proposed project's VMT was established using the regional SANDAG Series 13 Base Year 2012 Travel Demand Model, customized to reflect the proposed project's unique attributes. The city's established City Average VMT per Capita was also used to establish the significance criteria, which is 15% VMT per capita below the City Average, consistent with OPR's Technical Advisory guidance. For residential projects in the City of Carlsbad, this threshold is calculated to be 19.14 VMT per capita. Thus, any Project VMT per capita that exceeds this significance threshold is considered a potentially significant impact that requires mitigation.

Carlsbad Bicycle Master Plan

The City adopted a Bicycle MP in 2007, which guides the future development of the City's bicycle facilities and enhancement of the existing bikeway network. The MP identifies existing and planned bicycle facilities and addresses gaps, constrained areas, and improvements at intersections. The MP complies with the requirements of the Bicycle Transportation Account, which is an annual program providing state funds for bicycle facilities improvements.

Carlsbad Pedestrian Master Plan

The City's Pedestrian MP was completed in August 2008. The MP is intended to assist the City in implementing and improving their pedestrian facilities into the future.

5.14.3 Project Impacts

Vehicle Miles Traveled

The proposed project was reviewed against the city's draft screening criteria to determine if a VMT study is necessary. The City's Draft Guidelines identify the following seven (7) cases where a development project would be considered to screen out of a VMT analysis based on a presumption that its VMT effects would be less than significant:

1. Small Projects (less than 110 ADT)

2. Projects Located Near Transit (projects located within one-half mile of the Carlsbad Village or Carlsbad Poinsettia Coaster Stations, or within one-half mile of the Plaza Camino Real Transit Station)
3. Local-Serving Retail and Similar Land Uses (defined as retail development less than 50,000 SF, or larger than 50,000 SF with a market study showing it serves primarily local uses)
4. Local Serving Public Facilities (i.e. government uses, parks and public schools, etc.)
5. Affordable Housing Projects (residential projects that are 100% affordable located within infill areas)
6. Redevelopment Projects That Result in a Net Reduction in VMT (projects that replace an existing development with a more efficient land use)
7. Projects Located in Efficient VMT Areas (projects that lie within high efficiency areas of Carlsbad as shown on the City's screening map)

As discussed later in this section, the trip generation associated with the proposed project, which is characterized as a mixed-use, infill project shows that the project will generate 3,070 gross ADT, with a net increase of 2,059 ADT with the existing retail uses removed. The proposed Marja Acres project is not located within one-half mile of the identified transit centers and provides modest retail (10,000 SF total) and approximately 15% of senior housing. It does not result in less VMT than the existing local serving retail uses it replaces, and it is not located in an efficient VMT area based on the city's screening map. As such, the proposed project requires a VMT analysis.

Thresholds of Significance

As defined in Appendix G of the *CEQA Guidelines*, proposed project impacts to traffic and transportation would be considered significant if the proposed project was determined to:

- Conflict with a program, plan, or ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities
- Conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b)
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)
- Result in inadequate emergency access

Project VMT Analysis

Analysis Methodology. The City's Draft Guidelines provide guidance on how project VMT is obtained for the following four (4) different types of projects:

1. Single Land -Use Projects
2. Mixed -Use Projects
3. Redevelopment Projects
4. Regional Retail Projects

For the purposes of this analysis, the proposed project was evaluated as a mixed -use project (retail and residential). Retail development falls into a category which is neither considered to be residential



nor employment based. The proposed 10,000 SF of retail is local -serving. The OPR Technical Advisory advises that “if the project leads to a net increase in provision of locally -serving retail, transportation impacts from the retail portion of the development should be presumed to be less than significant.” OPR’s Technical Advisory also recommends that lead agencies determine which retail projects are local -serving, but it does include a general guideline that retail projects larger than 50,000 SF might be considered regional -serving rather than local serving.

Per the City’s Draft Guidelines, “local -serving retail within a mixed -use development can be presumed to have a less than significant VMT impact and excluded from analysis.” Given the proposed project’s retail/commercial component is 10,000 SF, it can clearly be categorized as local serving. Therefore, no further evaluation of the retail component is warranted or provided.

Project Trip Generation

With redevelopment of the site, the proposed project is calculated to generate 2,059 net new ADT. Using the residential land use as the primary metric, the proposed project was evaluated using VMT per capita. The City’s Draft Guidelines indicate that a project generating less than 2,400 ADT would utilize VMT values obtained from the City’s screening maps. At the time the VMT technical report was prepared (Recirculated Draft EIR Appendix J), the screening maps were not available. Instead, a project-specific model using the SANDAG regional travel demand model, consistent with the Draft Guidelines’ direction for projects exceeding 2,400 ADT was prepared. More information on the model development is provided in Appendix J.

Table 5.14-1 tabulates the net proposed project traffic generation.

Table 5.14-1. Proposed Project Trip Generation Summary

Land Use	Quantity	Daily Driveway Trips	
		Rate	Volume
Townhomes (Condominium) ^a	252 DU	8/DU	2,016
Apartment ^b	46 DU	3.7/DU	170
Specialty Retail ^c	6,000 sf	40/ksf	240
Restaurant (Sit-down, high turnover)	4,000 sf	160/ksf	640
<i>Subtotal</i>	—	—	3,070
<i>Mixed-Use Reduction (10%)^d</i>	—	—	(307)

Table 5.14-1. Proposed Project Trip Generation Summary

Land Use	Quantity	Daily Driveway Trips	
		Rate	Volume
<i>Existing Traffic to be Removed^e</i>	—	—	(700)
Net New Traffic	—	—	2,059

Source: DEIR, Appendix J.

Notes:

^a Condominium rate applies to “any multi-family 6-20 DU/acre”.

^b Senior adult housing. ITE Trip Generation Manual, 10th Edition.

^c Specialty retail rate applies to proposed bike shop and unspecified retail.

^d SANDAG allows a mixed-use reduction of 10% “where residential and commercial retail are combined.” The proposed project proposes 10,000 SF of total commercial for 298 residential units.

^e Existing traffic is calculated based on actual peak hour driveway counts (November 2017). Existing daily traffic estimated from peak hour counts.

DU=dwelling unit; ksf=thousand square feet; sf=square foot

Impact Analysis

Impact 5.14-1 Would the proposed project conflict with a program, plan, or ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Pursuant to SB 743 and CEQA Guidelines Section 15064.3 subdivision (b), VMT is the program for measuring and addressing circulation system facilities under CEQA. Analysis of LOS is no longer the metric for determining transportation environmental impacts. Consistency with other city plans and policies including but not limited to Growth Management related to circulation and General Plan Mobility Element policies will be analyzed as part of the project’s analysis and recommendations in the project staff report. Implementation of mitigation to reduce VMT would ensure that the proposed project does not create significant environmental impacts related to the circulation system. Transit, bicycle and pedestrian facilities all exist, and are proposed to remain, adjacent to the project site. The ridesharing and transit subsidies discussed below in Impact 5.14-2 would encourage residents to utilize the existing transit amenities proximate to the site on El Camino Real.

Impact 5.14-2 Would the proposed project conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b)?

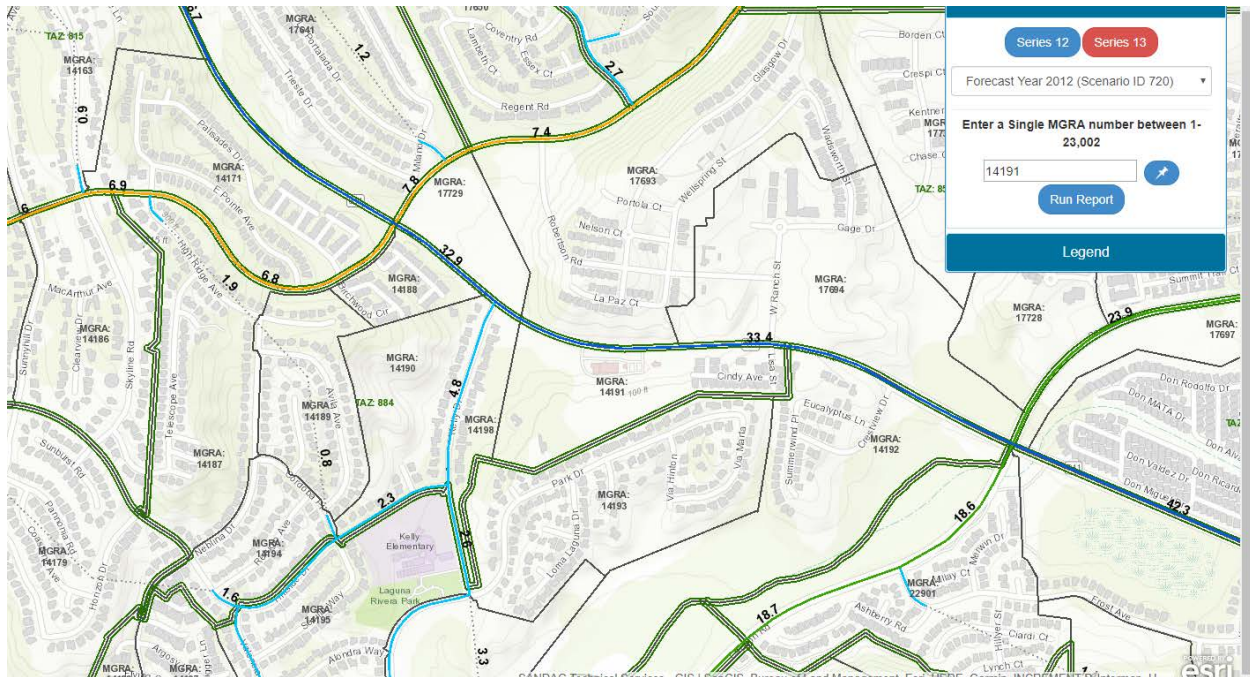
A VMT analysis was conducted for the Marja Acres project considering the residential population type (i.e. residents). The retail component of the proposed project is ancillary to the residential uses, and per the City’s Draft Guidelines, would be screened out as “Local Serving Retail.”

Consistent with the recommended guidelines, a regional travel demand model was used to calculate VMT per capita. The SANDAG Series 13 Base Year 2012 Travel Demand Model was customized to reflect the proposed project land uses.

The SANDAG travel demand model is made up of Traffic Analysis Zones (TAZs) that themselves are made up based on Master Geographic Reference Area (MGRAs). Those MGRAs are coded with land

use type and synthetic population inputs which in turn generate a number of households for residential uses and a number of persons/employees for non-residential uses. The proposed project site is located within MGRA 14191 of TAZ 884. The synthetic population and household inputs relating to the proposed project land uses were inputted into MGRA 14191, in place of the existing inputs. In addition, a centroid connector was relocated to assign all project trips to El Camino Real consistent with the location of the proposed project's access locations. The centroid connector is the network connection from the TAZ to the street system. Figure 5.14-1 shows the location of the Project MGRA and TAZ in the SANDAG model.

Figure 5.14-1. Project MGRA and TAZs



Once the model inputs were adjusted to reflect the proposed project's specific development details, the VMT per capita results were computed. It should be noted that, as previously mentioned, the commercial component is ancillary to the residential uses. However, for purposes of reflecting the internal capture between the uses and accurately calculating VMT per capita for the residents within a mixed-use project, the retail/restaurant land uses were coded into the model.

Table 5.14-3 shows the Project VMT analysis. Based on the model outputs, the Project VMT per capita is 20.70 miles. Appendix J contains the VMT model data.

Table 5.14-3. Project VMT Findings

Scenario	City Average ^a	Significance Threshold (85% of City Average)	Project VMT ^b	Project VMT Over Threshold	% Over City Average	Transportation Impact? (Over Threshold)
Residential VMT per Capita	22.52	19.14	20.70	1.56	7.54	Yes

Notes:

^a City Average VMT per capita based on the City of Carlsbad 2012 Vehicle Miles Traveled (VMT) Per Capita by Traffic Analysis Zone (TAZ) Comparison to City-Wide Average.

^b Project VMT based on SANDAG Series 13 Base Year 2012 Travel Demand Model, customized to reflect the Project land uses.

The results of the Project VMT comparison indicate that the project would exceed the significance threshold by 7.54%. This is considered a significant impact and implementation of mitigation would be required to decrease VMT by .56 at least 7.54% to reduce the Project's potentially significant impact. The project will implement the following project design features to reduce project VMT. Additionally, mitigation measures are required, as discussed in Section 5.14.5, to reduce the Project's potentially significant impact to a level less than significant.

CAPCOA Transportation Strategies

The transportation strategies identified in the CAPCOA document that would potentially reduce residential mixed-use project VMT are grouped into five (5) categories:

1. Land Use/ Location ("LUT" series measures)
2. Neighborhood/ Site Enhancement ("SDT" series measures)
3. Parking Policy/ Pricing ("PDT" series measures)
4. Commute Trip Reduction Programs ("TRT" series measures)
5. Transit System Improvements ("TST" series measures)

Upon review of the various categories and their respective measures, some Land Use/ Location series measures would apply to overall project VMT of 20.70 VMT per capita based on the intrinsic characteristics of the project (e.g. mixed-use, suburban infill, proximity to transit, schools, employment, etc.). These types of measures would be considered "Project Design Features." It should be noted

that in the suburban context, the maximum reduction for any/all LUT measures is limited to 5%. The overall maximum reduction of all Transportation Measures combined is 15%.

Additionally, Commute Trip Reduction measures were identified that could be implemented to reduce the project's commute VMT by way of mitigation. The project's commute VMT is provided from the model and represents 33.60% of the overall project VMT. It should be noted that in the suburban context, the maximum reduction for any/all TRT measures is limited to 15%. Again, the overall maximum reduction of all Transportation Measures combined is 15% for a suburban environment.

Both sets of CAPCOA measures are consistent with the City's draft *Table 1: TDM Measure Summary* table contained in Appendix B of the VMT Technical Analysis (Recirculated Draft EIR Appendix J).

Applicable CAPCOA Land Use/Location Measures (Project Design Features)

Land use features are more appropriately termed "Project Design Features," more so than mitigation measures. For purposes of consistency with the CAPCOA terminology, the term "Land Use Measure" is utilized. The two (2) CAPCOA Land Use/Location Measures considered applicable to the proposed project are:

- LUT-3: Increase Diversity of Urban and Suburban Developments (Mixed-Use)
- LUT-6: Integrate Affordable and Below Market Rate Housing

Consideration and analysis was also given to LUT-1 ("Increase Density") and LUT-4 ("Increase Destination Accessibility"), which provide credit for increased density and for proximity and accessibility to jobs or other attractions, respectively. Please refer to Recirculated Draft EIR Appendix J for a discussion related to the applicability/effectiveness of CAPCOA LUT-1 and LUT-4. In summary, while LUT-1 and LUT-4 were considered, to provide for a conservative assessment, no additional reductions were taken for either land use measure to avoid the potential for double counting.

The following is brief overview of each applicable Land Use/Location measure. Relevant excerpts from CAPCOA for each measure are contained in Appendix D of the VMT technical report (see Recirculated Draft EIR Appendix J).

LUT-3: Increase Diversity of Urban and Suburban Developments (Mixed-Use)

This measure reflects the inherent reductions in VMT due to the placement of complementing land uses in close proximity to one another that may be accommodated by non-auto modes of transport. For example, when residential areas are in the same neighborhood as retail and office buildings, a resident does not need to travel outside of the neighborhood to meet his/her trip needs. The measure applies to projects in a suburban context such as Carlsbad and is applicable to residential and mixed-use projects such as Marja Acres. Recirculated Draft EIR Appendix J provides a detailed analysis of this measure as it relates to the project, and provides the VMT reduction calculations achieved by this measure. As indicated, using the formulas in CAPCOA as shown in Appendix J, the resulting individual strategy reduction is 15.42%.

LUT-6: Integrate Affordable and Below Market Rate Housing

This measure reflects the effect of income on the probability that a commuter will take transit to walk or work and acknowledges that lower income families tend to have lower levels of auto ownership. The measure applies to projects in a suburban context such as Carlsbad and is applicable to residential and mixed-use projects such as Marja Acres. Recirculated Draft EIR Appendix J provides

a detailed analysis of this measure as it relates to the project, and provides the VMT reduction calculations achieved by this measure. As indicated, using the formulas in CAPCOA as shown in Appendix J, the resulting individual strategy reduction is 0.6%.

The measures described above would reduce project VMT. However, mitigation measures are required, as discussed in Section 5.14.5, to reduce the Project's potentially significant impact to a level less than significant.

Impact 5.14-3 Increase Hazards Due to a Design Feature

Would the proposed project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Access to the project site is proposed via two existing right-in/right-out driveways to El Camino Real. All proposed project circulation improvements will be designed and constructed to City standards; and, therefore, would not result in design hazards. Once constructed, the proposed project would not increase hazards due to an incompatible use. No impact would result.

Impact 5.14-4 Emergency Access

Would the proposed project result in inadequate emergency access?

As previously mentioned above, access to the project site is proposed via two existing right-in/right-out driveways to El Camino Real. The driveways would be required to meet standards imposed by the Carlsbad Fire Department. Therefore, the proposed project is not anticipated to result in inadequate emergency access and this is considered a less than significant impact.

5.14.4 Level of Significance before Mitigation

Implementation of the proposed project would not, increase hazards due to a design feature, or inadequate emergency access, therefore, no mitigation measures are proposed.

Implementation of the proposed project would result in a significant impact related to VMT. Implementation of Mitigation Measures T-1, T-2, and T-3 would reduce the impact to a level less than significant.

5.14.5 Environmental Mitigation Measures

VMT Reduction Strategies

The following provides a summary of the VMT reduction strategies that will be implemented for the proposed project. Detailed calculations for the proposed measures are provided in Recirculated Draft EIR Appendix J.

The City's Draft Guidelines contain *Appendix D – Vehicle Miles Traveled Reduction Strategies and Effectiveness Calculations* that present several quantifiable strategies that can be used to mitigate a project's VMT impacts, as explained in *Quantifying Green House Gas Mitigation Measures*, published by the California Air Pollution Control Officers Association (CAPCOA) in 2010.

As shown previously in Table 5.14-3, the proposed project exceeds the allowable significance criteria by 1.56 VMT per capita (7.54%) and must therefore provide quantifiable mitigation to reduce the VMT impacts by at least this amount. Mitigation for VMT impacts to residential projects would aim to achieve one or both of the following results:

- Reducing the number of daily vehicle trips (especially single-occupant vehicle trips), and/or
- Reducing the length of trips made by residents

Applicable CAPCOA Commute Trip Reduction Programs for Residents (Mitigation Measures)

The three (3) CAPCOA Commute Trip Reduction Program measures proposed by the applicant to mitigate Project VMT impacts are:

- TRT-3: Provide Ride Sharing Programs
- TRT-4: Implement Subsidized or Discounted Transit Programs
- TRT-7: Implement Commute Trip Reduction Marketing

CAPCOA Measures TRT-3 and TRT-4 will be effectively marketed through details provided in CAPCOA TRT-7. Relevant excerpts from CAPCOA for each measure are contained in *Appendix D* of the Recirculated Draft EIR Appendix J.

Mitigation Measures

T-1 Prior to issuance of a certificate of occupancy for the first market-rate unit, the project applicant shall provide evidence to the City of Carlsbad's Community Development Department that it will implement measure CAPCOA TRT-3: Provide Ride Sharing Programs. To satisfy this requirement, the project will provide a ride-sharing program, which will be available to all residents, that promotes ride-sharing through a multi-faceted approach, including but not limited to:

- Provide a web site or message board for coordinating rides.
- Assist residents with matching commutes with ridesharing opportunities.
- Promote rideshare/carpool programs.
- Promote the use of any carpool platforms or applications utilized by the Citywide Transportation Demand Management program, such as RideAmigos, or equivalent.

The project applicant will fund the first three years of this mitigation measure, which amounts to a total of \$62,640 (\$20,880/year), prior to issuance of a certificate of occupancy for the first market-rate unit, and the project's homeowners association will then assess new residents to fund the subsidy program in perpetuity upon issuance of the final certificate of occupancy for the 250th market-rate unit.

The project's Transportation Coordinator, appointed by the homeowners' association, shall oversee the ride sharing program and provide updates on the implementation and funding status of this measure to the City of Carlsbad's Community Development Department consistent with the provisions of Section 2.8 of the Carlsbad TDM Handbook.

T-2 Prior to issuance of a certificate of occupancy for the first market-rate unit, the project applicant shall provide evidence to the City of Carlsbad's Community Development Department that it will implement measure CAPCOA TRT-4: Implement Subsidized or Discounted Transit Program. To satisfy this requirement, the project will provide subsidized/discounted monthly public transit passes, which will be available to all residents.

The project applicant will fund the first three years of this mitigation measure, which amounts to a total of \$136,890 (\$45,630/year), prior to issuance of a certificate of occupancy for the first market-rate unit, and the project's homeowners' association will then assess new residents to fund the subsidy program in perpetuity upon issuance of the final certificate of occupancy for the 250th market-rate unit.

The project's Transportation Coordinator, appointed by the homeowners' association, shall oversee the transit subsidy program and provide updates on the implementation and funding status of this measure to the City of Carlsbad's Community Development Department consistent with the provisions of Section 2.8 of the Carlsbad TDM Handbook.

T-3 Prior to issuance of a certificate of occupancy for the first market-rate unit, the project applicant shall provide evidence to the City of Carlsbad's Community Development Department that it will implement measure CAPCOA TRT-7: Implement Commute Trip Reduction Marketing. To satisfy this requirement, the project will promote and advertise transportation options available to new and existing residents. Marketing strategies may include, but not be limited to:

- Providing a website maintained by the HOA.
- Monthly email newsletter blasts.
- Promotional materials available in common areas.
- Information packets accompanying HOA documents for new residents.

Mitigation Effectiveness

The intrinsic VMT benefits included in the Project Design Features based on its type and location are accounted for with two LUT-series reductions totaling 5% off of the overall Project VMT. An additional three strategies are proposed as mitigation measures that apply to the project's commute VMT, which is a subset of the overall VMT.

When combined, the total scaled reduction of 10.29% is greater than the 7.54% reduction needed to mitigate the significant VMT impact. The reduced project VMT result is 18.57 VMT per capita, which is less than the significance threshold of 19.14 VMT per capita. Table 5.14-4 summarizes the results.

Table 5.14-4. Project VMT Reduction Strategies Results

Reduction Measure	Range of Effectiveness	VMT Reduction	Categorical VMT Reduction	Total VMT Reduction	Mitigated Project VMT/Capita	Threshold of Significance (VMT/ Capita)	Impact Fully Mitigated?
Project Design Features				10.29%	18.57	19.14	Yes
LUT-3: Increase Diversity of Urban and Suburban Developments (Mixed-Use) (overall VMT)	9.0-30.0%	15.42%	5.0%				
LUT-6: Integrate Affordable and Below Market Rate Housing (overall VMT)	0.04-1.20%	0.60%					
Mitigation Measures							
TRT-3: Provide Ride Sharing Programs (commute VMT)	1.0-15.0%	1.68%	5.57%				
TRT-4: Implement Subsidized or Discounted Transit Programs (commute VMT)	0.3-20.0%	2.65%					

Table 5.14-4. Project VMT Reduction Strategies Results

Reduction Measure	Range of Effectiveness	VMT Reduction	Categorical VMT Reduction	Total VMT Reduction	Mitigated Project VMT/Capita	Threshold of Significance (VMT/ Capita)	Impact Fully Mitigated?
TRT-7: Implement Commute Trip Reduction Marketing (commute VMT)	0.8-4.0%	1.34%					

Notes:

Results based on methodology from Quantifying Green House Gas Mitigation Measures (CAPCOA – 2010)

LUT-series capped at 5% for suburban context.

TRT-series measures apply to commute VMT, which is 33.6% of the overall Project VMT.

The Project's total VMT Reduction is 10.29%. Each VMT reduction measure's percent reduction is combined multiplicatively in order to get the Project's total VMT Reduction. As discussed in Chapter 6 of the CAPCOA report, the equation is as follows:

Combined Total Reduction = 1 - [(1-A) x (1-B) x (1-C) x ...]; A,B,C, = each measure's percent reduction

5.14.6 Level of Significance after Mitigation

The proposed project would result in a potentially significant VMT impact. Specifically, the proposed project's VMT per capita was determined to be 20.70. The significance threshold of 85% of the City Average VMT per capita is 19.14; therefore, the proposed project would result in an increase over the VMT significance threshold by 7.54%.

The proposed project will implement five CAPCOA measures to reduce the project's VMT impact to a level less than significant. Two measures are directly related to the proposed project's intrinsic design and location, and are considered project design features. Additionally, Mitigation Measure(s) T-1, T-2, and T-3, which would implement an additional three CAPCOA measures, are required to reduce the Project's VMT per capita to below a level of significance. Implementation of the project design features and proposed mitigation measures would reduce the proposed project's per capita VMT by 10.29%, which would reduce the proposed project's VMT to a level less than significant.

Implementation of the proposed project would not, increase hazards due to a design feature, or inadequate emergency access, therefore, no mitigation measures are necessary.

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6 Alternatives (Annotated)

The following provides revisions to Chapter 6 Alternatives of the Draft EIR related to Greenhouse Gas Emissions/Climate Change and Transportation/Circulation. Because only those sections of the Draft EIR have been revised as part of this Recirculated Draft EIR, only those changes are shown in ~~strikeout~~/underline for those environmental topics for each alternative.

6.3 Evaluation of Alternatives

6.3.1 No Project/No Development Alternative

Greenhouse Gas Emissions/Climate Change. Under this alternative, no GHG impacts would occur as no new emissions would occur. This alternative would avoid any significant increases in GHG emissions as no new development would occur on-site. However, implementation of this alternative would not avoid a significant GHG impact associated with the proposed project, as no significant GHG impact has been identified.

Transportation/Circulation. This alternative would avoid any significant traffic impacts as no new development would occur on-site.

6.3.2 Existing General Plan (No Density Bonus/Maximum General Plan Residential Density and Commercial Intensity) Alternative

Greenhouse Gas Emissions/Climate Change. Implementation of this alternative would not avoid or reduce a potential GHG/climate change impact as no significant impact related to this environmental issue has been identified. GHG emissions would also be generated during construction of this alternative. Additionally, operation of this alternative would generate GHG emissions through motor vehicle trips to and from the project site; landscape maintenance equipment operation; energy use (natural gas and generation of electricity consumed by the proposed project); solid waste disposal; and generation of electricity associated with water supply, treatment, and distribution and wastewater treatment. This alternative would generate 2,951 MTCO₂e per year, which is greater than the proposed project ~~and the CAP screening threshold.~~ Based on a residential density of 2.59 persons per household found within the San Diego Association of Government (SANDAG) Series 13 Growth Forecast for the City, the alternative would have a residential population of 466 (2.59 persons per household X 180 units) (SANDAG 2013). Based on an employment density of 20.83 jobs per developed acre found within the SANDAG Series 13 Growth Forecast for the City, the alternative would have an employee population of 21 (20.83 jobs per developed acre X 1.03 acres) (SANDAG 2013). Therefore, the alternative would have a total service population of 487 persons. Using the efficiency metric threshold, this alternative would have an efficiency metric of 6.1 MT CO₂e/service population, which would exceed the threshold of 3.6 MT CO₂e/service population.

~~With respect to the city's CAP, this alternative would emit greater than 900 MTCO₂e as the approximately 45,000 square feet of commercial development and 180 dwelling units would emit 2,951 MTCO₂e, which exceed the threshold noted in the CAP checklist question. However, this alternative is consistent with the Carlsbad General Plan and zoning of the project site, which maintains consistency with the city's CAP. Moreover, this alternative would have to implement the measures~~

~~within the CAP checklist, and thus, this alternative would be consistent with the CAP. As such, there would be no significant impact on climate change.~~

Transportation/Circulation. Implementation of this alternative would not avoid or reduce a transportation/circulation impact. The proposed project consists of 298 residential units and 10,000 square feet of local serving retail/restaurant uses. Per the City's draft guidelines, the local serving retail use is less than 50,000 square feet and thus, screens out from requiring a VMT analysis. The proposed project-specific residential uses were calculated to generate 20.70 VMT per capita. The Citywide average VMT per capita is 22.52 and the threshold for a significant impact is 15% below the Citywide average at 19.14 VMT per capita. The proposed project requires mitigation measures that would reduce the VMT per capita by 7.54% to be less than significant. This alternative consists of 180 residential units and 40,000 square feet of local serving retail. The local retail would also screen out from requiring analysis under this alternative. However, with the larger sized local-serving retail on site, there is the potential for a decrease in off-site resident-based trips due to the increase in amenity retail uses available to residents. Thus, the residential uses would be expected to have less than or similar VMT per capita as that of the proposed project which exceeds the City's threshold. Therefore, this alternative would result in a potentially significant impact and would require mitigation measures to reduce the VMT per capita to be less than significant. In order to achieve that reduction, financial subsidies toward transit and rideshare programs are necessary. Implementation of mitigation would render this alternative's transportation impacts less than significant, similar to the proposed project. ~~Implementation of this alternative would not avoid or reduce a transportation/circulation impact, as no significant transportation/circulation impact has been identified associated with the proposed project. This alternative would generate approximately 2,540 average daily vehicular trips, which is approximately 481 average daily trips more than the proposed project trip generation. This alternative is calculated to result in 142 AM peak hour trips, which is approximately 36 AM peak hour trips less than the proposed project. Approximately 221 PM peak hour trips would be generated under this alternative, which is approximately 48 additional trips as compared to the proposed project.~~

6.3.3 Reduced Project (No Density Bonus/Growth Management Control Point General Plan Density) Alternative

Greenhouse Gas Emissions/Climate Change. Implementation of this alternative would not avoid or reduce a potential GHG/climate change impact as no significant impact related to this environmental issue has been identified. GHG emissions would be generated during construction of this alternative. Additionally, operation of this alternative would generate GHG emissions through motor vehicle trips to and from the project site; landscape maintenance equipment operation; energy use (natural gas and generation of electricity consumed by the proposed project); solid waste disposal; and generation of electricity associated with water supply, treatment, and distribution and wastewater treatment. This alternative would emit 2,489 MTCO_{2e} per year, which ~~would exceed the CAP screening threshold,~~ and is greater than the proposed project. Based on a residential density of 2.59 persons per household found within the SANDAG Series 13 Growth Forecast for the City, the alternative would have a residential population of 373 (2.59 persons per household X 144 units) (SANDAG 2013). Based on an employment density of 20.83 jobs per developed acre found within the SANDAG Series 13 Growth Forecast for the City, the alternative would have an employee population of 12 (20.83 jobs per developed acre X 0.57 acres) (SANDAG 2013). Therefore, the alternative would have a total service population of 385 persons. Using the efficiency metric threshold, this alternative would have an efficiency metric of 6.5 MT CO_{2e}/service population, which would exceed the threshold of 3.6 MT CO_{2e}/service population.

~~With respect to the city's CAP, this alternative includes 25,000 square feet of commercial use, and 144 dwelling units, and therefore, this alternative would emit greater than 900 MTCO_{2e}. Thus, this alternative exceeds the thresholds noted in the CAP checklist question. However, this alternative is consistent with the Carlsbad General Plan and zoning of the project site, which maintains consistency with the city's CAP. This alternative would have to implement the measures within the CAP checklist, and therefore it would be consistent with the CAP. Thus, development of this alternative would not result in a significant impact on climate change.~~

Transportation/Circulation. Implementation of this alternative would not avoid or reduce a transportation/circulation impact. The proposed project consists of 298 residential units and 10,000 square feet of local serving retail/restaurant uses. Per the City's draft guidelines, the local serving retail use is less than 50,000 square feet and thus, screens out from requiring a VMT analysis. The proposed project-specific residential uses were calculated to generate 20.70 VMT per capita. The Citywide average VMT per capita is 22.52 and the threshold for a significant impact is 15% below the Citywide average at 19.14 VMT per capita. The proposed project requires mitigation measures that would reduce the VMT per capita by 7.54% to be less than significant. This alternative consists of 144 residential units and 25,000 square feet of local serving retail. The local retail would also screen out from requiring analysis under this alternative. The residential uses would be expected to have a similar VMT per capita as that of the proposed project which exceeds the City's threshold. Thus, this alternative would result in a potentially significant impact and would require mitigation measures to reduce the VMT per capita to be less than significant. In order to achieve that reduction, financial subsidies toward transit and rideshare programs are necessary. Implementation of mitigation would render this alternative's transportation impacts less than significant, similar to the proposed project.

~~Implementation of this alternative would not avoid or reduce a transportation/circulation impact, as no significant transportation/circulation impact has been identified associated with the proposed project. This alternative would generate approximately 2,317 average daily vehicular trips, which is approximately 258 average daily trips more than the proposed project trip generation. This alternative is calculated to result in 187 AM peak hour trips, which is approximately 9 AM peak hour trips more than the proposed project. Approximately 182 PM peak hour trips would be generated under this alternative, which is approximately 9 more trips as compared to the project.~~

6.3.4 Previously Proposed Plan Alternative

Greenhouse Gas Emissions/Climate Change. Implementation of this alternative would not avoid or reduce a potential GHG/climate change impact as no significant impact related to this environmental issue has been identified. GHG emissions would be generated during construction of this alternative. Additionally, operation of this alternative would generate GHG emissions through motor vehicle trips to and from the project site; landscape maintenance equipment operation; energy use (natural gas and generation of electricity consumed by the project); solid waste disposal; and generation of electricity associated with water supply, treatment, and distribution and wastewater treatment. This alternative would generate 2,965 MTCO_{2e} per year, which is greater than ~~the CAP screening threshold~~ and the proposed project's GHG emissions. Based on a residential density of 2.59 persons per household found within the SANDAG Series 13 Growth Forecast for the City, the alternative would have a residential population of 603 (2.59 persons per household X 233 units) (SANDAG 2013). Based on an employment density of 20.83 jobs per developed acre found within the SANDAG Series 13 Growth Forecast for the City, the alternative would have an employee population of 8 (20.83 jobs per developed acre X 0.37 acres) (SANDAG 2013). Therefore, the alternative would have a total service population of 611 persons. Using the efficiency metric threshold, this alternative would have

an efficiency metric of 4.9 MT CO₂e/service population, which would exceed the threshold of 3.6 MT CO₂e/service population.

~~With respect to the city's CAP, this alternative would emit greater than 900 MTCO₂e as the approximately 16,000 square feet of commercial development and 233 dwelling units would emit 2,965 MTCO₂e, which exceeds the threshold noted in the CAP checklist question. This alternative would require a Carlsbad General Plan Amendment and Zone Change in order to implement the proposed uses, which means that this alternative is not consistent with the city's CAP. However, this alternative would have to implement the measures within the CAP checklist, and thus, this alternative would be consistent with the CAP. As such, this alternative would not have a significant climate change impact. A detailed evaluation and consistency analysis would be required to determine whether implementation of this alternative would maintain consistency with the city's CAP.~~

Transportation/Circulation. Implementation of this alternative would not avoid or reduce a transportation/circulation impact. The proposed project consists of 298 residential units and 10,000 square feet of local serving retail/restaurant uses. Per the City's draft guidelines, the local serving retail use is less than 50,000 square feet and thus, screens out from requiring a VMT analysis. The proposed project-specific residential uses were calculated to generate 20.70 VMT per capita. The Citywide average VMT per capita is 22.52 and the threshold for a significant impact is 15% below the Citywide average at 19.14 VMT per capita. The proposed project requires mitigation measures that would reduce the VMT per capita by 7.54% to be less than significant. This alternative consists of 218 residential units plus 15 inclusionary accessory residential units and 16,000 square feet of local serving retail. The local retail would also screen out from requiring analysis under this alternative. The residential uses would be expected to have a similar VMT per capita as that of the proposed project which exceeds the City's threshold. Thus, this alternative would result in a potentially significant impact and would require mitigation measures to reduce the VMT per capita to be less than significant. In order to achieve that reduction, financial subsidies toward transit and rideshare programs are necessary. Implementation of mitigation would render this alternative's transportation impacts less than significant, similar to the proposed project.

~~Implementation of this alternative would not avoid or reduce a transportation/circulation impact, as no significant transportation/circulation impact has been identified associated with the proposed project. This alternative would generate approximately 2,273 average daily vehicular trips, which is approximately 214 average daily trips greater than the proposed project trip generation. This alternative is calculated to result in 196 AM peak hour trips, which is approximately 18 AM peak hour trips greater than the proposed project. Approximately 185 PM peak hour trips would be generated under this alternative, which is approximately 12 more trips as compared to the proposed project.~~

6.3.5 Alternative Project Location

Greenhouse Gas Emissions/Climate Change. Implementation of this alternative would not avoid or reduce a potential GHG/climate change impact as no significant impact related to this environmental issue has been identified. GHG emissions would be generated during construction of this alternative. Additionally, operation of this alternative would generate GHG emissions through motor vehicle trips to and from the project site; landscape maintenance equipment operation; energy use (natural gas and generation of electricity consumed by the project); solid waste disposal; and generation of electricity associated with water supply, treatment, and distribution and wastewater treatment. This alternative would generate 4,188 MT CO₂e per year which is greater than ~~the CAP screening threshold~~ and the proposed project's GHG emissions. Based on a residential density of 2.59 persons per household found within the SANDAG Series 13 Growth Forecast for the City, the alternative would



have a residential population of 715 (2.59 persons per household X 276 units) (SANDAG 2013). Based on an employment density of 20.83 jobs per developed acre found within the SANDAG Series 13 Growth Forecast for the City, the alternative would have an employee population of 29 (20.83 jobs per developed acre X 1.38 acres) (SANDAG 2013). Therefore, the alternative would have a total service population of 744 persons. Using the efficiency metric threshold, this alternative would have an efficiency metric of 5.6 MT CO₂e/service population, which would exceed the threshold of 3.6 MT CO₂e/service population.

~~With respect to the city's CAP, this alternative would emit greater than 900 MT CO₂e as the approximately 60,000 square feet of commercial development and 276 dwelling units would emit 4,188 MT CO₂e per year, which exceeds the thresholds noted in the CAP checklist question. This alternative would require a General Plan Amendment and Zone Change in order to implement the proposed uses, which means that this alternative is not consistent with the city's CAP. However, this alternative would have to implement the measures within the CAP checklist, and thus, this alternative would be consistent with the CAP. As such, this alternative would not have a significant climate change impact. A detailed evaluation and consistency analysis would be required to determine whether implementation of this alternative would maintain consistency with the city's CAP.~~

Transportation/Circulation. Implementation of this alternative would not avoid or reduce a transportation/circulation impact. The proposed project consists of 298 residential units and 10,000 square feet of local serving retail/restaurant uses. Per the City's draft guidelines, the local serving retail use is less than 50,000 square feet and thus, screens out from requiring a VMT analysis. The proposed project-specific residential uses were calculated to generate 20.70 VMT per capita. The Citywide average VMT per capita is 22.52 and the threshold for a significant impact is 15% below the Citywide average at 19.14 VMT per capita. The proposed project requires mitigation measures that would reduce the VMT per capita by 7.54% to be less than significant. This alternative consists of 276 residential units and 60,000 square feet of retail uses. The residential uses proposed by this alternative would be expected to have less than or similar VMT per capita as that of the proposed project, which exceeds the City's threshold. Therefore, the residential portion of this alternative would result in a potentially significant impact and would require mitigation measures to reduce the VMT per capita to be less than significant. In order to achieve that reduction, financial subsidies toward transit and rideshare programs are necessary. Implementation of the mitigation measures to reduce VMT impacts to below significant levels proposed by the project would also mitigate VMT per capita impacts under this alternative. The retail uses proposed in this alternative would require analysis as the amount exceeds 50,000 square feet. However, with the larger sized local-serving retail on site, there is the potential for a decrease in off-site resident-based trips due to the increase in amenity retail uses available to residents. Thus, this alternative would be expected to result in less VMT per capita as that of the proposed project which exceeds the City's threshold, mitigation for the residential VMT would likely still be required to ensure the impact was less than significant.

~~Implementation of this alternative would not avoid or reduce a transportation/circulation impact, as no significant transportation/circulation impact has been identified associated with the proposed project. This alternative would generate approximately 3,447 average daily vehicular trips, which is approximately 1,388 average daily trips greater than the proposed project trip generation. This alternative is calculated to result in 197 AM peak hour trips, which is approximately 19 AM peak hour trips greater than the proposed project. Approximately 309 PM peak hour trips would be generated under this alternative, which is approximately 136 more trips as compared to the proposed project.~~

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7 Analysis of Long-Term Effects (Annotated)

The following provides revisions to Chapter 7 Analysis of Long-Term Effects of the Draft EIR related to Greenhouse Gas Emissions/Climate Change and Transportation/Circulation. Because only those sections of the Draft EIR have been revised as part of this Recirculated Draft EIR, only those changes are shown in ~~strikeout~~/underline for those environmental topics as it relates to cumulative impacts.

7.1.1 Greenhouse Gas Emissions and Climate Change

~~The proposed project would incrementally increase greenhouse gas emissions. The estimated annual project-generated emissions in 2023 from area, energy, mobile, solid waste, and water/wastewater sources and amortized project construction emissions would be approximately 2,334 MTCO_{2e} per year, which exceeds the city's screening threshold of 900 MTCO_{2e} per year. However, the proposed project is consistent with the land use assumptions used in the CAP and the General Plan land use and zoning designations of the project site. Furthermore, the proposed project would include applicable CAP measures, such as solar PV systems, LED lighting, and EV charging capable parking spaces and charging stations, to minimize GHG emissions in line with the city's CAP. The impact is considered less than significant. Therefore, no significant GHG impacts from the project are expected, and the project would be classified in compliance with the intent of AB 32. The cumulative impact is considered less than significant.~~

As discussed in Section 5.7 Greenhouse Gas Emissions/Climate Change, the proposed project would not exceed the efficiency metric threshold for 2025 and thus would be consistent with Senate Bill 32 targets for 2030 (to reduce GHG emissions to 40 percent below 1990 levels by 2030). Furthermore, the proposed project would also have a lower efficiency metric than the 2030 threshold (2.73 MT CO_{2e}/person/year), five years beyond the proposed project's anticipated buildout year. Therefore, GHG impacts would be considered less than significant. Cumulative projects would also be required to achieve either the established efficiency metric thresholds should stand alone GHG analysis be prepared for each cumulative project, or they would be required to comply with the City's Climate Action Plan (CAP) once it is re-qualified by the City. The CAP sets a baseline for GHG emissions, forecasts future emissions, and establishes a long term strategy to reduce emissions. Emissions reduction targets are established through 2035 and are achievable through enforceable measures, and monitoring and reporting processes (Climate Action Plan Checklist Consistency, 2019). These GHG reductions are consistent with the state's goals to reduce GHG emissions to 1990 levels by 2020 and by 80% below 1990 levels by 2050 (City of Carlsbad, 2015a). For individual projects, consistency with the CAP is determined through compliance with CAP-implementing ordinances and, even during the current time period when the CAP is not qualified, City ordinances adopted to implement the CAP continue to be in effect so projects would need to comply with all applicable ordinances.

Additionally, As discussed in detail in Section 5.7, Greenhouse Gas Emissions, of this EIR, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. The project is consistent with the overall goals of the city's General Plan directed at reducing GHG emissions. As such, the proposed project in conjunction with cumulative projects would not contribute to a cumulatively considerable impact related to GHG emissions/climate change and would not result in a cumulative impact related to conflict with an

~~applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. Further, as detailed above, the project is consistent with the city's CAP.~~

7.1.2 Transportation/Circulation

The proposed project's traffic impacts related to ~~VMT, increase hazards due to a design feature, and inadequate emergency access and cumulative~~ impacts are evaluated in Section 5.14, Transportation/Circulation, of this Recirculated Draft EIR.

Implementation of the project design features and proposed mitigation measures, would reduce the proposed project's per capita VMT by 10.29%, which would reduce the proposed project's VMT to a level less than significant. Pursuant to the Office of Planning and Research, a "project that falls below an efficiency-based threshold that is aligned with long-term environmental goals and relevant plans would have no cumulative impact distinct from the project impact." Therefore, the project's cumulative transportation/circulation impact would be less than significant. Additionally, implementation of the proposed project would not, increase hazards due to a design feature, or inadequate emergency access. Therefore, the proposed project in conjunction with cumulative projects would not represent a cumulatively significant impact with respect to these aspects of transportation/circulation.

~~The traffic analysis (Appendix J of this EIR) used two distinct analyses required for both the *Carlsbad Growth Management Plan* as well as CEQA.~~

~~To present a near-term traffic condition, traffic volumes for approved/pending projects (Table 7-1) were developed and added to the existing traffic volume. Two cumulative scenarios were analyzed in the Transportation Impact Analysis (Appendix J of this EIR) and discussed in Section 5.14, Transportation/Circulation, of this EIR:~~

- ~~• Existing plus Cumulative (both with, and without the extension of College Boulevard)~~
- ~~• Existing plus Cumulative plus Project Conditions (both with, and without the extension of College Boulevard)~~

~~As discussed in Section 5.14, Transportation/Circulation, of this EIR, the proposed project would not result in a significant impact to intersections and roadway segments under both cumulative scenarios. Therefore, no significant cumulative traffic impacts would occur.~~

8 References

This section has been updated as indicated in strikeout/underline text within Section 8.1 below.

8.1 Project-Specific Technical Reports

Dudek. ~~2019~~2020. *Air Quality and Greenhouse Gas Emissions Analysis Technical Report for the Marja Acres Community Plan*. Carlsbad, California.

Linscott Law & Greenspan Engineers (LLG). 2020. *Vehicle Miles Traveled Analysis Marja Acres*

~~Linscott Law & Greenspan Engineers (LLG). 2019. *Transportation Impact Analysis for the Marja Acres Project*.~~

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Appendix B

Air Quality and Greenhouse Gas Emissions Analysis Technical Report

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**Air Quality and Greenhouse Gas Emissions
Analysis Technical Report
for the Marja Acres Community Plan
Carlsbad, California**

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APRIL 2020

Air Quality and Greenhouse Gas Emissions Analysis Technical Report for the Marja Acres Community Plan

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
°C	degrees Celsius
°F	degrees Fahrenheit
µg/m ³	micrograms per cubic meter
AB	Assembly Bill
AERMOD	American Meteorological Society/EPA Regulatory Model
amsl	above mean sea level
AQMP	Air Quality Management Plan
ATCM	Airborne Toxic Control Measures
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CALGreen	California's Green Building Standards
CalRecycle	California Department of Resources Recycling and Recovery
CAP	Climate Action Plan
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFC	chlorofluorocarbons
CH ₄	methane
City	City of Carlsbad
CNRA	California Natural Resources Agency
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
County	San Diego County
CPUC	California Public Utilities Commission
CY	cubic yard
DPM	diesel particulate matter
EO	Executive Order
EPA	U.S. Environmental Protection Agency
First Update	<i>First Update to the Climate Change Scoping Plan: Building on the Framework</i>
GHG	greenhouse gas
GWP	global warming potential
H ₂ S	hydrogen sulfide
HCFC	hydrochlorofluorocarbons
HFC	hydrofluorocarbon
HRA	Health Risk Assessment
IPCC	Intergovernmental Panel on Climate Change
LEED	Leadership in Energy and Environmental Design
LOS	level of service

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Acronym/Abbreviation	Definition
LST	localized significance thresholds
MMT	million metric ton
MT	metric tons
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NHTSA	National Highway Traffic Safety Administration
NO ₂	nitrogen dioxide
NO _x	oxides of nitrogen
O ₂	oxygen
O ₃	ozone
OEHHA	Office of Environmental Health Hazard Assessment
PFC	perfluorocarbon
PM ₁₀	particulate matter with a diameter less than or equal to 10 microns (coarse particulate matter)
PM _{2.5}	particulate matter with a diameter less than or equal to 2.5 microns (fine particulate matter)
ppb	parts per billion
ppm	parts per million
Project	Marja Acres Community Plan
RAQS	Regional Air Quality Strategy
RCP	Regional Comprehensive Plan
RPS	Renewable Portfolio Standard
RTP	Regional Transportation Plan
SANDAG	San Diego Association of Governments
SB	Senate Bill
SCS	Sustainable Communities Strategy
SCAQMD	South Coast Air Quality Management District
Scoping Plan	<i>Climate Change Scoping Plan: A Framework for Change</i>
SCS	Sustainable Communities Strategy
SDAB	San Diego Air Basin
SDAPCD	San Diego Air Pollution Control District
Second Update	<i>2017 Climate Change Scoping Plan Update</i>
SF ₆	sulfur hexafluoride
SIP	State Implementation Plan
SLCP	short-lived climate pollutant
SO ₂	sulfur dioxide
SO ₄	sulfates
SO _x	sulfur oxides
SP	service population
SRA	source-receptor area
TAC	toxic air contaminants
TIS	traffic impact study

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Acronym/Abbreviation	Definition
VMT	Vehicle miles traveled
VOC	volatile organic compound
ZEV	Zero Emissions Vehicle
ZNE	zero net energy

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Air Quality and Greenhouse Gas Emissions Analysis Technical Report for the Marja Acres Community Plan

EXECUTIVE SUMMARY

The purpose of this technical report is to assess the potential air quality and greenhouse gas (GHG) emissions impacts associated with implementation of the proposed Marja Acres Community Plan (Project). This assessment utilizes the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.).

Project Overview

The Marja Acres development plan proposes a total number of 298 dwelling units consisting of 236 townhomes within the R-15 General Plan designated area, and 46 age restricted affordable house units, 16 townhomes, a 4,000 square-foot restaurant pad and a 6,000 square-foot retail pad area within the General Commercial General Plan designated area. The proposed project has been designed to emphasize superior architecture, views, privacy, walkability, internal connectivity and recreational amenities.

In order to provide housing for low and very low-income seniors, the Project proposes to utilize the opportunities provided by the Residential Density Bonus section of the City of Carlsbad Zoning ordinance (CMC 21.86). For those projects that reserve 20% of total units for low income residents, CMC 21.86 allows an increase in the number of units beyond the maximum General Plan density calculations. The Project provides 20% of units for low and very low-income seniors. Section 21.86 is fully intended to implement the Housing Element of the General Plan and support existing City of Carlsbad policies designed to increase the stock of affordable housing.

Air Quality

The air quality impact analysis evaluated the potential for adverse impacts to air quality due to construction and operational emissions resulting from the Project. Impacts were evaluated for their significance based on the San Diego Air Pollution Control District's (SDAPCD) mass daily criteria air pollutant thresholds of significance (SDAPCD 2016a). Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. Criteria air pollutants include ozone (O₃), nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM₁₀), particulate matter with an aerodynamic diameter less than or equal to 2.5 microns (PM_{2.5}), and lead. Pollutants that are evaluated include volatile organic compounds (VOCs) (also referred to as reactive organic gases), oxides of nitrogen (NO_x), CO, sulfur oxides (SO_x), PM₁₀, and PM_{2.5}. VOCs and NO_x are important because they are precursors to O₃.

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Air Quality Plan Consistency

If a project proposes development that is greater than that anticipated in the local plan and San Diego Association of Government's (SANDAG's) growth projections, the project might be in conflict with the State Implementation Plan (SIP) and Regional Air Quality Strategy (RAQS) and may contribute to a potentially significant cumulative impact on air quality. The proposed Project was deemed to be consistent with the current air quality plan, because the anticipated growth associated with the Project does not exceed that projected by SANDAG. In addition, the Project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations. Based on these considerations, impacts related to the Project's potential to conflict with or obstruct implementation of the applicable air quality plan would be less than significant.

Construction Criteria Air Pollutant Emissions

Construction of the Project would result in the temporary addition of pollutants to the local airshed caused by on-site sources (i.e., off-road construction equipment, soil disturbance, and VOC off-gassing) and off-site sources (i.e., on-road haul trucks, vendor trucks, and worker vehicle trips). Maximum daily construction emissions would not exceed the SDAPCD significance thresholds for VOC, NO_x, CO, SO_x, PM₁₀, or PM_{2.5} during construction.

Operational Criteria Air Pollutant Emissions

Operational year 2025 was assumed as the first complete year following construction. Operation of the Project would generate operational criteria air pollutants from mobile sources (vehicles), area sources (consumer product use, architectural coatings, and landscape maintenance equipment), and energy (natural gas). Maximum operational emissions would not exceed the SDAPCD operational significance thresholds for VOC, NO_x, CO, SO_x, PM₁₀, or PM_{2.5}.

The potential for the Project to result in a cumulatively considerable impact, per the SDAPCD guidance and thresholds, is based on the Project's potential to exceed the project-specific daily thresholds. As discussed previously, maximum construction and operational emissions would not exceed the SDAPCD significance thresholds for VOC, NO_x, CO, SO_x, PM₁₀, or PM_{2.5}. Therefore, the Project would not result in a cumulatively considerable increase in criteria air pollutants.

Exposure of Sensitive Receptors

Construction activities would not generate emissions in excess of the SDAPCD site-specific mass daily thresholds; therefore, site-specific construction impacts during construction of the Project would be less than significant. In addition, diesel equipment would also be subject to the California Air Resources

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Board (CARB) Airborne Toxic Control Measures (ATCMs) for in-use off-road diesel fleets, which would minimize diesel particulate matter (DPM) emissions. The health risk assessment for construction showed cancer and non-cancer risks below levels of significance. No residual toxic air contaminants (TAC) emissions and corresponding cancer risk are anticipated after construction, since no long-term sources of TAC emissions are anticipated during operation of the Project. Therefore, impacts to sensitive receptors during construction would be less than significant.

The CO hotspot analysis showed that the intersections that operated at a Level of Service of E or worse would not exceed the 1-hour or 8-hour ambient air quality standard. As such, potential Project-generated impacts associated with CO hotspots would be less than significant.

Odors

Potential odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, architectural coatings, and asphalt pavement application, which would disperse rapidly from the Project site and generally occur at magnitudes that would not affect substantial numbers of people. Impacts associated with odors during construction would be less than significant. The Project is a residential development that would not include land uses with sources that have the potential to generate substantial odors, and impacts associated with odors during operation would be less than significant.

Greenhouse Gas Emissions

Global climate change is primarily considered a cumulative impact but must also be evaluated on a project-level under CEQA. A project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHG emissions. GHGs are gases that absorb infrared radiation in the atmosphere. Principal GHGs regulated under state and federal law and regulations include carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). GHG emissions are measured in metric tons of CO₂ equivalent (MT CO₂e), which account for weighted global warming potential (GWP) factors for CH₄ and N₂O.

Project-Generated Construction and Operational Greenhouse Gas Emissions

Construction of the Proposed Project would result in GHG emissions primarily associated with the use of off-road construction equipment, on-road hauling and vendor (material delivery) trucks, and worker vehicles. The proposed Project would generate operational GHG emissions from area sources (landscape maintenance), energy sources (electricity and natural gas consumption), mobile sources (vehicle trips), water supply and wastewater treatment, and solid waste. Estimated annual proposed Project-generated operational GHG emissions at buildout in 2025 would be approximately 1,932 MT CO₂e per year. Estimated annual proposed Project-generated

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operational emissions in 2025, plus amortized Project construction plus sequestered carbon emissions, would be approximately 1,925 MT CO₂e per year.

An efficiency metric threshold for the Project's buildout year was estimated at 3.60 MT CO₂e/person/year (see Section 3.4.1 for additional information). The Project would have a total service population of 797 (25 employees + 772 residents) and an efficiency metric of 2.42 MT CO₂e/person/year (1,925 MT CO₂e per year / 797 persons). Therefore, the Project would not exceed the efficiency metric threshold for 2025 and thus would be consistent with the state's targets within SB 32 for 2030 (to reduce GHG emissions to 40 percent below 1990 levels by 2030). Furthermore, the Project would also have a lower efficiency metric than the threshold for 2030 based on the SB 32 target (2.73 MT CO₂e/person/year), five years beyond the Project's anticipated buildout year. Therefore, GHG impacts would be considered less than significant.

Consistency with Applicable Greenhouse Gas Reduction Plans

The proposed Project was shown to be consistent with CARB's Scoping Plan and SANDAG's Regional Plan, further showing the proposed Project's consistency with the goals of SB 32 and SB 375. The proposed Project does not conflict with applicable plans adopted with the purpose of reducing GHG emissions; therefore, the proposed Project's impacts on GHG emissions would be less than significant.

Air Quality and Greenhouse Gas Emissions Analysis Technical Report for the Marja Acres Community Plan

1 INTRODUCTION

1.1 Report Purpose and Scope

The purpose of this technical report is to assess the potential air quality and greenhouse gas (GHG) emissions impacts associated with implementation of the proposed Marja Acres Community Plan (Project). This assessment uses the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.) and is based on the emissions-based significance thresholds recommended by the San Diego Air Pollution Control District (SDAPCD) and other applicable thresholds of significance.

This introductory section provides a description of the Project and the Project location (see Figure 1). Section 2, Air Quality, describes the air quality–related environmental setting, regulatory setting, existing air quality conditions, and thresholds of significance and analysis methodology and presents an air quality impact analysis per Appendix G of the CEQA Guidelines. Section 3, Greenhouse Gas Emissions, follows the same format as Section 2 and similarly describes the GHG emissions–related environmental setting, regulatory setting, existing climate change conditions, and thresholds of significance and analysis methodology and presents a GHG emissions impact analysis per Appendix G of the CEQA Guidelines. Section 4, References Cited, includes a list of the references cited. Section 5, List of Preparers, includes a list of those who prepared this technical report.

1.2 Project Description

The Marja Acres development plan proposes a total number of 298 dwelling units consisting of 236 townhomes within the R-15 General Plan designated area, and 46 age-restricted affordable apartments, 16 townhomes, a 4,000-square-foot restaurant pad, and a 6,000-square-foot retail pad area within the General Commercial General Plan designated area. The proposed project has been designed to emphasize superior architecture, views, privacy, walkability, internal connectivity, and recreational amenities. The Project is located in close proximity to numerous bus stops and transit routes. The Project is surrounded by dedicated bike lanes and hiking/walking trails (including the Laguna Riviera City Park and trail). The Project is walkable and includes its own landscaped walking path.

In order to provide housing for low and very low-income seniors, the Project proposes to utilize the opportunities provided by the Residential Density Bonus section of the City of Carlsbad Zoning ordinance (CMC 21.86). For those projects that reserve 20% of total units for low income residents, CMC 21.86 allows an increase in the number of units beyond the maximum General Plan density calculations. The Project provides 20% of units for low and very low-income seniors. Section 21.86 is fully intended to implement the Housing Element of the General Plan and support existing

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City of Carlsbad policies designed to increase the stock of affordable housing. The objectives of this project are to:

- Fill a need for housing type and density that is in low supply within the City's residential inventory pipeline
- Provide attainably priced homes for young families and professionals close to employment centers
- Provide income and age restricted affordable housing to implement the City's General Plan housing goals by increasing the stock of housing for both low-income and very-low income seniors
- Create a walkable mixed-use community that connects the neighborhood to community gathering areas and the commercial amenities within Marja Acres
- Foster a unique sense of place that establishes the identity of the Marja Acres in the City of Carlsbad
- Create a new neighborhood that will be consistent with the goals and objectives of the General Plan
- Minimize potential negative impacts to adjacent residential land uses through placement of the townhomes, grading techniques, landscape berms, retaining walls and fencing
- Provide for a variety of architectural styles yet maintain a cohesive overall character enhanced by the landscape plan for the community
- Develop a plan that is economically feasible and capable of being implemented based on existing and anticipated future economic conditions
- Preserve the privacy of existing neighbors
- Retain the existing agrarian architecture character of the site
- Provide an active, safe, pleasant environment that encourages human contact and social activity
- Provide housing types to serve a broad variety of residents at various stages in life
- Provide for 7,000 square feet of local neighborhood commercial uses



SOURCE: NAIP 2016

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2 AIR QUALITY

2.1 Environmental Setting

The Project area is located within the San Diego Air Basin (SDAB) and is subject to the SDAPCD guidelines and regulations. The SDAB is one of 15 air basins that geographically divide the State of California. The weather of the San Diego region, as in most of Southern California, is influenced by the Pacific Ocean and its semi-permanent high-pressure systems that result in dry, warm summers and mild, occasionally wet winters. The average temperature ranges (in degrees Fahrenheit (°F)) from the mid-40s to the high 90s. Most of the region's precipitation falls from November to April with infrequent (approximately 10%) precipitation during the summer. The average seasonal precipitation along the coast is approximately 10 inches; the amount increases with elevation as moist air is lifted over the mountains to the east.

The topography in the San Diego region varies greatly, from beaches on the west to mountains and desert on the east. Along with local meteorology, the topography influences the dispersal and movement of pollutants in the SDAB. The mountains to the east prohibit dispersal of pollutants in that direction and help trap them in inversion layers as described in the next section.

The interaction of ocean, land, and the Pacific High Pressure Zone maintains clear skies for much of the year and influences the direction of prevailing winds (westerly to northwesterly). Local terrain is often the dominant factor inland, and winds in inland mountainous areas tend to blow through the valleys during the day and down the hills and valleys at night.

2.1.1 Meteorological and Topographical Conditions

The SDAB lies in the southwest corner of California, comprises the entire San Diego region, approximately covering 4,260 square miles, and is an area of high air pollution potential. The SDAB experiences warm summers, mild winters, infrequent rainfalls, light winds, and moderate humidity. This usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

The climate also drives the pollutant levels. The climate of San Diego is classified as Mediterranean, but it is incredibly diverse due to the topography. The climate is dominated by the Pacific High pressure system that results in mild, dry summers and mild, wet winters. The Pacific High drives the prevailing winds in the SDAB. The winds tend to blow onshore during the daytime and offshore at night. In the fall months, the SDAB is often impacted by Santa Ana winds. These winds are the result of a high pressure system over the Nevada-Utah region that overcomes the westerly wind pattern and forces hot, dry winds from the east to the Pacific Ocean (SDAPCD 2015a). The winds blow the air basin's pollutants out to sea. However, a weak Santa

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Ana can transport air pollution from the South Coast Air Basin and greatly increase the San Diego O₃ concentrations. A strong Santa Ana also primes the vegetation for firestorm conditions.

The SDAB experiences frequent temperature inversions. Subsidence inversions occur during the warmer months as descending air associated with the Pacific High Pressure Zone meets cool marine air. The boundary between the two layers of air creates a temperature inversion that traps pollutants. Another type of inversion, a radiation inversion, develops on winter nights when air near the ground cools by heat radiation and air aloft remains warm. The shallow inversion layer formed between these two air masses also can trap pollutants. As the pollutants become more concentrated in the atmosphere, photochemical reactions occur that produce ozone (O₃), commonly known as smog.

Light daytime winds, predominantly from the west, further aggravate the condition by driving air pollutants inland, toward the mountains. During the fall and winter, air quality problems are created due to carbon monoxide (CO) and oxides of nitrogen (NO_x) emissions. CO concentrations are generally higher in the morning and late evening. In the morning, CO levels are elevated due to cold temperatures and the large number of motor vehicles traveling. Higher CO levels during the late evenings are a result of stagnant atmospheric conditions trapping CO in the area. Since CO is produced almost entirely from automobiles, the highest CO concentrations in the basin are associated with heavy traffic. Nitrogen dioxide (NO₂) levels are also generally higher during fall and winter days when O₃ concentrations are lower.

The local climate in the southern part of the County is characterized as semi-arid with consistently mild, warmer temperatures throughout the year. The average summertime high temperature in the region is approximately 72°F. The average wintertime low temperature is approximately 53°F. Average precipitation in the local area is approximately 10.5 inches per year, with the bulk of precipitation falling between December and March (WRCC 2017).

2.1.2 Pollutants and Effects

2.1.2.1 Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The federal and state standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include O₃, NO₂, CO, sulfur dioxide (SO₂), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM₁₀), particulate matter with an aerodynamic diameter less than or

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equal to 2.5 microns ($PM_{2.5}$), and lead. These pollutants, as well as toxic air contaminants (TACs), are discussed in the following paragraphs.¹ In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants.

Ozone. O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun's energy and O_3 precursors. These precursors are mainly NO_x and volatile organic compounds (VOCs). The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere O_3 layer (stratospheric ozone) and at the Earth's surface in the troposphere (ozone).² The O_3 that the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) regulate as a criteria air pollutant is produced close to the ground level, where people live, exercise, and breathe. Ground-level O_3 is a harmful air pollutant that causes numerous adverse health effects and is, thus, considered "bad" O_3 . Stratospheric, or "good," O_3 occurs naturally in the upper atmosphere, where it reduces the amount of ultraviolet light (i.e., solar radiation) entering the Earth's atmosphere. Without the protection of the beneficial stratospheric O_3 layer, plant and animal life would be seriously harmed.

O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes (EPA 2013). These health problems are particularly acute in sensitive receptors such as the sick, the elderly, and young children.

Nitrogen Dioxide. NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide, which is a colorless, odorless gas. NO_x plays a major role, together with VOCs, in the atmospheric reactions that produce O_3 . NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources are transportation and stationary fuel combustion sources, such as electric utility and industrial boilers.

¹ The descriptions of each of the criteria air pollutants and associated health effects are based on the EPA's Criteria Air Pollutants (2016a) and the CARB Glossary of Air Pollutant Terms (2016a).

² The troposphere is the layer of the Earth's atmosphere nearest to the surface of the Earth. The troposphere extends outward about 5 miles at the poles and about 10 miles at the equator.

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NO₂ can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections (EPA 2016b).

Carbon Monoxide. CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon, or fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, such as the project location, automobile exhaust accounts for the majority of CO emissions. CO is a nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, which is a typical situation at dusk in urban areas from November to February. The highest levels of CO typically occur during the colder months of the year, when inversion conditions are more frequent.

In terms of adverse health effects, CO competes with oxygen, often replacing it in the blood, reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions.

Sulfur Dioxide. SO₂ is a colorless, pungent gas formed primarily from incomplete combustion of sulfur-containing fossil fuels. The main sources of SO₂ are coal and oil used in power plants and industries; as such, the highest levels of SO₂ are generally found near large industrial complexes. In recent years, SO₂ concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO₂ and limits on the sulfur content of fuels.

SO₂ is an irritant gas that attacks the throat and lungs and can cause acute respiratory symptoms and diminished ventilator function in children. When combined with particulate matter, SO₂ can injure lung tissue and reduce visibility and the level of sunlight. SO₂ can also yellow plant leaves and erode iron and steel.

Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. PM_{2.5} and PM₁₀ represent fractions of particulate matter. Coarse particulate matter (PM₁₀) consists of particulate matter that is 10 microns or less in diameter and is about 1/7 the thickness of a human hair. Major sources of PM₁₀ include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Fine

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particulate matter (PM_{2.5}) consists of particulate matter that is 2.5 microns or less in diameter and is roughly 1/28 the diameter of a human hair. PM_{2.5} results from fuel combustion (e.g., from motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, PM_{2.5} can be formed in the atmosphere from gases such as sulfur oxides (SO_x), NO_x, and VOCs.

PM_{2.5} and PM₁₀ pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. PM_{2.5} and PM₁₀ can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the blood stream, causing damage elsewhere in the body. Additionally, these substances can transport adsorbed gases such as chlorides or ammonium into the lungs, also causing injury. Whereas PM₁₀ tends to collect in the upper portion of the respiratory system, PM_{2.5} is so tiny that it can penetrate deeper into the lungs and damage lung tissue. Suspended particulates also damage and discolor surfaces on which they settle and produce haze and reduce regional visibility.

People with influenza, people with chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death as a result of breathing particulate matter. People with bronchitis can expect aggravated symptoms from breathing in particulate matter. Children may experience a decline in lung function due to breathing in PM₁₀ and PM_{2.5} (EPA 2009).

Lead. Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturing of batteries, paints, ink, ceramics, and ammunition; and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phaseout of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phaseout of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emissions sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth. Children are highly susceptible to the effects of lead.

Volatile Organic Compounds. Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to formation of O₃ are referred to and regulated as VOCs (also referred to as reactive organic gases). Combustion engine

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exhaust, oil refineries, and fossil-fueled power plants are the sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

The primary health effects of VOCs result from the formation of O₃ and its related health effects. High levels of VOCs in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons, such as benzene, are considered TACs. There are no separate health standards for VOCs as a group.

Sulfates. Sulfates are the fully oxidized form of sulfur, which typically occur in combination with metals or hydrogen ions. Sulfates are produced from reactions of SO₂ in the atmosphere. Sulfates can result in respiratory impairment and reduced visibility.

Vinyl Chloride. Vinyl chloride is a colorless gas with a mild, sweet odor, which has been detected near landfills, sewage plants, and hazardous waste sites, due to the microbial breakdown of chlorinated solvents. Short-term exposure to high levels of vinyl chloride in the air can cause nervous system effects such as dizziness, drowsiness, and headaches. Long-term exposure through inhalation can cause liver damage, including liver cancer.

Hydrogen Sulfide. Hydrogen sulfide is a colorless and flammable gas that has a characteristic odor of rotten eggs. Sources of hydrogen sulfide include geothermal power plants, petroleum refineries, sewers, and sewage treatment plants. Exposure to hydrogen sulfide can result in nuisance odors, as well as headaches and breathing difficulties at higher concentrations.

Visibility-Reducing Particles. Visibility-reducing particles are any particles in the air that obstruct the range of visibility. Effects of reduced visibility can include obscuring the viewshed of natural scenery, reducing airport safety, and discouraging tourism. Sources of visibility-reducing particles are the same as for PM_{2.5}, described above.

2.1.2.2 Non-Criteria Air Pollutants

Toxic Air Contaminants. A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic noncancer health effects. A toxic substance released into the air is considered a TAC. TACs are identified by federal and state agencies based on a review of available scientific evidence. In the State of California, TACs are identified through a two-step process that was established in 1983 under the Toxic Air Contaminant Identification and Control Act. This two-step process of risk identification and risk management and reduction was designed to protect residents from the health effects of toxic substances in the air. In addition, the California Air Toxics “Hot Spots” Information and Assessment Act, Assembly Bill (AB) 2588, was enacted by the

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legislature in 1987 to address public concern over the release of TACs into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years.

Examples include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources, such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources, such as automobiles; and area sources, such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and noncarcinogenic effects. Noncarcinogenic effects typically affect one or more target organ systems and may be experienced on either short-term (acute) or long-term (chronic) exposure to a given TAC.

Diesel Particulate Matter. Diesel particulate matter (DPM) is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. More than 90% of DPM is less than 1 micrometer in diameter (about 1/70th the diameter of a human hair) and, thus, is a subset of PM_{2.5} (CARB 2016a). DPM is typically composed of carbon particles (“soot,” also called black carbon) and numerous organic compounds, including over 40 known cancer-causing organic substances. Examples of these chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene (CARB 2016a). The CARB classified “particulate emissions from diesel-fueled engines” (i.e., DPM; 17 CCR 93000) as a TAC in August 1998. DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars and off-road diesel engines, including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70% of all airborne cancer risk in California is associated with DPM (CARB 2000). To reduce the cancer risk associated with DPM, CARB adopted a diesel risk reduction plan in 2000 (CARB 2000). Because it is part of PM_{2.5}, DPM also contributes to the same non-cancer health effects as PM_{2.5} exposure. These effects include premature death; hospitalizations and emergency department visits for exacerbated chronic heart and lung disease, including asthma; increased respiratory symptoms; and decreased lung function in children. Several studies suggest that exposure to DPM may also facilitate development of new allergies (CARB 2016b). Those most vulnerable to non-cancer health effects are children whose lungs are still developing and the elderly who often have chronic health problems.

Odorous Compounds. Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person’s reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The ability to detect odors varies considerably among the population and, overall, is

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quite subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. Known as odor fatigue, a person can become desensitized to almost any odor, and recognition may only occur with an alteration in the intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

Valley Fever. *Coccidioidomycosis*, more commonly known as “Valley Fever,” is an infection caused by inhalation of the spores of the *Coccidioides immitis* fungus, which grows in the soils of the southwestern United States. The fungus is very prevalent in the soils of California’s San Joaquin Valley, particularly in Kern County. Kern County is considered a highly endemic county (i.e., more than 20 cases annually of Valley Fever per 100,000 people) based on the incidence rates reported through 2016 (California Department of Public Health 2017). The ecologic factors that appear to be most conducive to survival and replication of the spores are high summer temperatures, mild winters, sparse rainfall, and alkaline, sandy soils.

San Diego County is not considered a highly endemic region for Valley Fever as the latest report from the California Department of Public Health listed San Diego County as having 4.4 cases per 100,000 people (California Department of Public Health 2017). Similarly, among the total reported incidents of Valley Fever in San Diego County from 2007 through 2016, only 0.6% of the cases were in the zip code where the project is located (County of San Diego 2017).

2.1.3 Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. Facilities and structures where these air pollution-sensitive people live or spend considerable amounts of time are known as sensitive receptors. Land uses where air pollution-sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (sensitive sites or sensitive land uses) (CARB 2005). The SDAPCD identifies sensitive receptors as those who are especially susceptible to adverse health effects from exposure to toxic air contaminants, such as children, the elderly, and the ill. Sensitive receptors include schools (grades Kindergarten through 12), day care centers, nursing homes, retirement homes, health clinics, and hospitals within 2 kilometers of the facility (SDAPCD 2015b). The closest sensitive receptors to the Proposed Project are residences adjacent to the southern, western, and eastern property boundaries.

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2.2 Regulatory Setting

2.2.1 Federal Regulations

2.2.1.1 *Criteria Air Pollutants*

The federal Clean Air Act (CAA), passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The EPA is responsible for implementing most aspects of the CAA, including the setting of the National Ambient Air Quality Standards (NAAQS) for major air pollutants, hazardous air pollutant standards, approval of state attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric O₃ protection, and enforcement provisions.

Under the CAA, NAAQS are established for the following criteria pollutants: O₃, CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and lead. The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The CAA requires the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a State Implementation Plan (SIP) that demonstrates how those areas will attain the standards within mandated time frames.

2.2.1.2 *Hazardous Air Pollutants*

The 1977, federal CAA amendments required the EPA to identify National Emission Standards for Hazardous Air Pollutants to protect public health and welfare. Hazardous air pollutants include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 CAA amendments, which expanded the control program for Hazardous Air Pollutants, 189 substances and chemical families were identified as Hazardous Air Pollutants.

2.2.2 State Regulations

2.2.2.1 *Criteria Air Pollutants*

The federal CAA delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to the CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for

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ensuring implementation of the California Clean Air Act of 1988, responding to the CAA and regulating emissions from motor vehicles and consumer products.

CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS. The CAAQS describe adverse conditions; that is, pollution levels must be below these standards before a basin can attain the standard. Air quality is considered “in attainment” if pollutant levels are continuously below the CAAQS and violate the standards no more than once each year. The CAAQS for O₃, CO, SO₂ (1-hour and 24-hour), NO₂, PM₁₀, PM_{2.5}, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. The NAAQS and CAAQS are presented in Table 1.

Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards ^a	National Standards ^b	
		Concentration ^c	Primary ^{c,d}	Secondary ^{c,e}
O ₃	1 hour	0.09 ppm (180 µg/m ³)	—	Same as Primary Standard ^f
	8 hours	0.070 ppm (137 µg/m ³)	0.070 ppm (137 µg/m ³) ^f	
NO ₂ ^g	1 hour	0.18 ppm (339 µg/m ³)	0.100 ppm (188 µg/m ³)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)	0.053 ppm (100 µg/m ³)	
CO	1 hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)	None
	8 hours	9.0 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)	
SO ₂ ^h	1 hour	0.25 ppm (655 µg/m ³)	0.075 ppm (196 µg/m ³)	—
	3 hours	—	—	0.5 ppm (1,300 µg/m ³)
	24 hours	0.04 ppm (105 µg/m ³)	0.14 ppm (for certain areas) ^g	—
	Annual	—	0.030 ppm (for certain areas) ^g	—
PM ₁₀ ⁱ	24 hours	50 µg/m ³	150 µg/m ³	Same as Primary Standard
	Annual Arithmetic Mean	20 µg/m ³	—	
PM _{2.5} ⁱ	24 hours	—	35 µg/m ³	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m ³	12.0 µg/m ³	15.0 µg/m ³
Lead ^{j,k}	30-day Average	1.5 µg/m ³	—	—
	Calendar Quarter	—	1.5 µg/m ³ (for certain areas) ^k	Same as Primary Standard
	Rolling 3-Month Average	—	0.15 µg/m ³	

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Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards ^a	National Standards ^b	
		Concentration ^c	Primary ^{c,d}	Secondary ^{c,e}
Hydrogen sulfide	1 hour	0.03 ppm (42 µg/m ³)	—	—
Vinyl chloride ^f	24 hours	0.01 ppm (26 µg/m ³)	—	—
Sulfates	24 hours	25 µg/m ³	—	—
Visibility reducing particles	8 hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to the number of particles when the relative humidity is less than 70%	—	—

Source: CARB 2016b.

Notes: µg/m³ = micrograms per cubic meter; mg/m³ = milligrams per cubic meter; ppm = parts per million by volume; O₃ = ozone; NO₂ = nitrogen dioxide; CO = carbon monoxide; SO₂ = sulfur dioxide; PM₁₀ = particulate matter with an aerodynamic diameter less than or equal to 10 microns; PM_{2.5} = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns.

^a California standards for O₃, CO, SO₂ (1-hour and 24-hour), NO₂, suspended particulate matter (PM₁₀, PM_{2.5}), and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

^b National standards (other than O₃, NO₂, SO₂, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once per year. The O₃ standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than 1. For PM_{2.5}, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

^c Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

^d National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

^e National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

^f On October 1, 2015, the national 8-hour O₃ primary and secondary standards were lowered from 0.075 to 0.070 ppm.

^g To attain the national 1-hour standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards, the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

^h On June 2, 2010, a new 1-hour SO₂ standard was established, and the existing 24-hour and annual primary standards were revoked. To attain the national 1-hour 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 SO₂ national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment of the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

ⁱ On December 14, 2012, the national annual PM_{2.5} primary standard was lowered from 15 µg/m³ to 12.0 µg/m³. The existing national 24-hour PM_{2.5} standards (primary and secondary) were retained at 35 µg/m³, as was the annual secondary standard of 15 µg/m³. The existing 24-hour PM₁₀ standards (primary and secondary) of 150 µg/m³ were also retained. The form of the annual primary and secondary standards is the annual mean averaged over 3 years.

^j California Air Resources Board 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.

^k The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m³ as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

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2.2.2.2 Toxic Air Contaminants

A TAC is defined by California law as an air pollutant that may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health. Federal laws use the Hazardous Air Pollutants to refer to the same types of compounds that are referred to as TACs under state law. California regulates TACs primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588).

AB 1807 sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB can designate a substance as a TAC. Pursuant to AB 2588, existing facilities that emit air pollutants above specified levels were required to (1) prepare a TAC emission inventory plan and report, (2) prepare a risk assessment if TAC emissions were significant, (3) notify the public of significant risk levels, and (4) if health impacts were above specified levels, prepare and implement risk reduction measures.

The following regulatory measures pertain to the reduction of DPM and criteria pollutant emissions from off-road equipment and diesel-fueled vehicles:

Idling of Commercial Heavy Duty Trucks (13 CCR 2485)

In July 2004, CARB adopted an Airborne Toxic Control Measure (ATCM) to control emissions from idling trucks. The ATCM prohibits idling for more than 5 minutes for all commercial trucks with a gross vehicle weight rating over 10,000 pounds. The ATCM contains an exception that allows trucks to idle while queuing or involved in operational activities.

In-Use Off-Road Diesel-Fueled Fleets (13 CCR 2449 et seq.)

In July 2007, CARB adopted an ATCM for in-use off-road diesel vehicles. This regulation requires that specific fleet average requirements are met for NO_x emissions and for particulate matter emissions. Where average requirements cannot be met, Best Available Control Technology requirements apply. The regulation also includes several recordkeeping and reporting requirements.

In response to AB 8 2X, the regulations were revised in July 2009 (effective December 3, 2009) to allow a partial postponement of the compliance schedule in 2011 and 2012 for existing fleets. On December 17, 2010, CARB adopted additional revisions to further delay the deadlines reflecting reductions in diesel emissions due to the poor economy and overestimates of diesel emissions in California. The revisions delayed the first compliance date until no earlier than

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January 1, 2014, for large fleets, with final compliance by January 1, 2023. The compliance dates for medium fleets were delayed until an initial date of January 1, 2017, and final compliance date of January 1, 2023. The compliance dates for small fleets were delayed until an initial date of January 1, 2019, and final compliance date of January 1, 2028. Correspondingly, the fleet average targets were made more stringent in future compliance years. The revisions also accelerated the phaseout of equipment with older equipment added to existing large and medium fleets over time, requiring the addition of Tier 2 or higher engines starting on March 1, 2011, with some exceptions: Tier 2 or higher engines on January 1, 2013, without exception; and Tier 3 or higher engines on January 1, 2018 (January 1, 2023, for small fleets).

On October 28, 2011 (effective December 14, 2011), the Executive Officer approved amendments to the regulation. The amendments included revisions to the applicability section and additions and revisions to the definition. The initial date for requiring the addition of Tier 2 or higher engines for large and medium fleets, with some exceptions, was revised to January 1, 2012. New provisions also allow for the removal of emission control devices for safety or visibility purposes. The regulation also was amended to combine the particulate matter and NO_x fleet average targets under one, instead of two, sections. The amended fleet average targets are based on the fleet's NO_x fleet average, and the previous section regarding particulate matter performance requirements was deleted completely. The Best Available Control Technology requirements, if a fleet cannot comply with the fleet average requirements, were restructured and clarified. Other amendments to the regulations included minor administrative changes to the regulatory text.

In-Use On-Road Diesel-Fueled Vehicles (13 CCR 2025)

On December 12, 2008, CARB adopted an ATCM to reduce NO_x and particulate matter emissions from most in-use on-road diesel trucks and buses with a gross vehicle weight rating greater than 14,000 pounds. The original ATCM regulation required fleets of on-road trucks to limit their NO_x and particulate matter emissions through a combination of exhaust retrofit equipment and new vehicles. The regulation limited particulate matter emissions for most fleets by 2011, and limited NO_x emissions for most fleets by 2013. The regulation did not require any vehicle to be replaced before 2012 and never required all vehicles in a fleet be replaced.

In December 2009, the CARB Governing Board directed staff to evaluate amendments that would provide additional flexibility for fleets adversely affected by the poor California economy. On December 17, 2010, CARB revised this ATCM to delay its implementation along with limited relaxation of its requirements. Starting on January 1, 2015, lighter trucks with a gross vehicle weight rating of 14,001 to 26,000 pounds with 20-year-old or older engines need to be replaced with newer trucks (2010 model year emissions equivalent as defined in the regulation). Trucks with a gross vehicle weight rating greater than 26,000 pounds with 1995 model year or older

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engines needed to be replaced as of January 1, 2015. Trucks with 1996–2006 model year engines must install a Level 3 (85% control) diesel particulate filter starting on January 1, 2012, to January 1, 2014, depending on the model year, and then must be replaced after 8 years. Trucks with 2007–2009 model year engines have no requirements until 2023, at which time they must be replaced with 2010 model year emissions equivalent engines, as defined in the regulation. Trucks with 2010 model year engines would meet the final compliance requirements. The ATCM provides a phase-in option under which a fleet operator would equip a percentage of trucks in the fleet with diesel particulate filters, starting at 30% as of January 1, 2012, with 100% by January 1, 2016. Under each option, delayed compliance is granted to fleet operators who have or will comply with requirements before the required deadlines.

On September 19, 2011 (effective December 14, 2011), the Executive Officer approved amendments to the regulations, including revisions to the compliance schedule for vehicles with a gross vehicle weight rating of 26,000 pounds or less to clarify that *all* vehicles must be equipped with 2010 model year emissions equivalent engines by 2023. The amendments included revised and additional credits for fleets that have downsized; implement early particulate matter retrofits; incorporate hybrid vehicles, alternative-fueled vehicles, and vehicles with heavy-duty pilot ignition engines; and implement early addition of newer vehicles. The amendments included provisions for additional flexibility, such as for low-usage construction trucks, and revisions to previous exemptions, delays, and extensions. Other amendments to the regulations included minor administrative changes to the regulatory text, such as recordkeeping and reporting requirements related to other revisions.

California Health and Safety Code Section 41700

Section 41700 of the California Health and Safety Code states that a person shall not discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health, or safety of any of those persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property. This section also applies to sources of objectionable odors.

2.2.3 Local Regulations

2.2.3.1 San Diego Air Pollution Control District

While CARB is responsible for the regulation of mobile emission sources within the state, local air quality management districts and air pollution control districts are responsible for enforcing

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standards and regulating stationary sources. The Project area is located within the SDAB and is subject to the guidelines and regulations of the SDAPCD.

In the County, O₃ and particulate matter are the pollutants of main concern, since exceedances of state ambient air quality standards for those pollutants have been observed there in most years. For this reason, the SDAB has been designated as a nonattainment area for the state PM₁₀, PM_{2.5}, and O₃ standards. The SDAB is also a federal O₃ attainment (maintenance) area for 1997 8-hour O₃ standard, an O₃ nonattainment area for the 2008 8-hour O₃ standard, and a CO maintenance area (western and central part of the SDAB only, including the Project area).

Federal Attainment Plans

In December 2016, the SDAPCD adopted an update to the Eight-Hour Ozone Attainment Plan for San Diego County (2008 O₃ NAAQS). The 2016 Eight-Hour Ozone Attainment Plan for San Diego County indicates that local controls and state programs would allow the region to reach attainment of the federal 8-hour O₃ standard (1997 O₃ NAAQS) by 2018 (SDAPCD 2016a). In this plan, SDAPCD relies on the Regional Air Quality Strategy (RAQS) to demonstrate how the region will comply with the federal O₃ standard. The RAQS details how the region will manage and reduce O₃ precursors (NO_x and VOCs) by identifying measures and regulations intended to reduce these pollutants. The control measures identified in the RAQS generally focus on stationary sources; however, the emissions inventories and projections in the RAQS address all potential sources, including those under the authority of CARB and the EPA. Incentive programs for reduction of emissions from heavy-duty diesel vehicles, off-road equipment, and school buses are also established in the RAQS.

Currently, the County is designated as moderate nonattainment for the 2008 NAAQS and maintenance for the 1997 NAAQS. As documented in the 2016 8-Hour Ozone Attainment Plan for San Diego County, the County has a likely chance of obtaining attainment due to the transition to low-emission cars, stricter new source review rules, and continuing the requirement of general conformity for military growth and the San Diego International Airport. The County will also continue emission control measures, including ongoing implementation of existing regulations in O₃ precursor reduction to stationary and area-wide sources, subsequent inspections of facilities and sources, and the adoption of laws requiring Best Available Retrofit Control Technology for control of emissions (SDAPCD 2016a).

State Attainment Plans

The SDAPCD and the SANDAG are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The

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RAQS for the SDAB was initially adopted in 1991 and is updated on a triennial basis, most recently in 2016 (SDAPCD 2016b). The RAQS outlines SDAPCD's plans and control measures designed to attain the state air quality standards for O₃. The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in the County and the cities in the County, to forecast future emissions and then determine from that the strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population, vehicle trends, and land use plans developed by the County and the cities in the County as part of the development of their general plans (SANDAG 2017a, 2017b).

In December 2016, the SDAPCD adopted the revised RAQS for the County. Since 2007, the San Diego region reduced daily VOC emissions and NO_x emissions by 3.9% and 7.0%, respectively; the SDAPCD expects to continue reductions through 2035 (SDAPCD 2016b). These reductions were achieved through implementation of six VOC control measures and three NO_x control measures adopted in the SDAPCD's 2009 RAQS (SDAPCD 2009a); in addition, the SDAPCD is considering additional measures, including three VOC measures and four control measures to reduce 0.3 daily tons of VOC and 1.2 daily tons of NO_x, provided they are found to be feasible region-wide. In addition, SDAPCD has implemented nine incentive-based programs, has worked with SANDAG to implement regional transportation control measures, and has reaffirmed the state emission offset repeal.

In regards to particulate matter emissions reduction efforts, in December 2005, the SDAPCD prepared a report titled "Measures to Reduce Particulate Matter in San Diego County" to address implementation of Senate Bill (SB) 656 in San Diego County (SB 656 required additional controls to reduce ambient concentrations of PM₁₀ and PM_{2.5}) (SDAPCD 2005). In the report, SDAPCD evaluated implementation of source-control measures that would reduce particulate matter emissions associated with residential wood combustion; various construction activities including earthmoving, demolition, and grading; bulk material storage and handling; carryout and trackout removal and cleanup methods; inactive disturbed land; disturbed open areas; unpaved parking lots/staging areas; unpaved roads; and windblown dust (SDAPCD 2005).

SDAPCD Rules and Regulations

As stated above, the SDAPCD is responsible for planning, implementing, and enforcing federal and state ambient standards in the SDAB. The following rules and regulations apply to all sources in the jurisdiction of SDAPCD and would apply to the Project.

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SDAPCD Regulation II: Permits; Rule 20.2: New Source Review Non-Major Stationary Sources. Requires new or modified stationary source units (that are not major stationary sources) with the potential to emit 10 pounds per day or more of VOC, NO_x, SO_x, or PM₁₀ to be equipped with Best Available Control Technology. For those units with a potential to emit above Air Quality Impact Assessments Trigger Levels, the units must demonstrate that such emissions would not violate or interfere with the attainment of any national air quality standard (SDAPCD 2016b).

The Project does not propose specific stationary sources. If stationary sources were to be included as part of the Project, or at a later date, those sources would be subject to Rule 20.2 and would require appropriate operating permits from the SDAPCD. Because the SDAPCD has not adopted specific criteria air pollutant thresholds for CEQA analyses, the thresholds identified in Rule 20.2 are utilized in this analysis as screening-level thresholds to evaluate project-level impacts, as discussed in Section 2.4.1.

SDAPCD Regulation IV: Prohibitions; Rule 50: Visible Emissions. Prohibits discharge into the atmosphere from any single source of emissions whatsoever any air contaminant for a period or periods aggregating more than 3 minutes in any period of 60 consecutive minutes, which is darker in shade than that designated as Number 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or of such opacity as to obscure an observer's view to a degree greater than does smoke of a shade designated as Number 1 on the Ringelmann Chart (SDAPCD 1997).

Construction of the Project may result in visible emissions, primarily during earth-disturbing activities, which would be subject to SDAPCD Rule 50. Although visible emissions are less likely to occur during operation of the Project, compliance with SDAPCD Rule 50 would be required during both construction and operational phases.

SDAPCD Regulation IV: Prohibitions; Rule 51: Nuisance. Prohibits the discharge, from any source, of such quantities of air contaminants or other materials that cause or have a tendency to cause injury, detriment, nuisance, annoyance to people and/or the public, or damage to any business or property (SDAPCD 1969).

Any criteria air pollutant emissions, TAC emissions, or odors that would be generated during construction or operation of the Project would be subject to SDAPCD Rule 51. Violations can be reported to the SDAPCD in the form of an air quality complaint by telephone, email, and online form. Complaints are investigated by the SDAPCD as soon as possible.

SDAPCD Regulation IV: Prohibitions; Rule 55: Fugitive Dust. Regulates fugitive dust emissions from any commercial construction or demolition activity capable of generating fugitive dust emissions,

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including active operations, open storage piles, and inactive disturbed areas, as well as track-out and carry-out onto paved roads beyond a project area (SDAPCD 2009b).

Construction of the Project, primarily during earth-disturbing activities, may result in fugitive dust emissions that would be subject to SDAPCD Rule 55. Fugitive dust emissions are not anticipated during operation of the Project.

SDAPCD Regulation IV: Prohibitions; Rule 67.0.1: Architectural Coatings. Requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories (SDAPCD 2015b). Construction and operation of the Project would include application of architectural coatings (e.g., paint and other finishes), which are subject to SDAPCD Rule 67.0.1. Architectural coatings used in the reapplication of coatings during operation of the Project would be subject to the VOC content limits identified in SDAPCD Rule 67.0.1, which applies to coatings manufactured, sold, or distributed within San Diego County.

SDAPCD Regulation XII: Toxic Air Contaminants; Rule 1200: Toxic Air Contaminants - New Source Review. Requires new or modified stationary source units with the potential to emit TACs above rule threshold levels to either demonstrate that they will not increase the maximum incremental cancer risk above 1 in 1 million at every receptor location, demonstrate that toxics best available control technology will be employed if maximum incremental cancer risk is equal to or less than 10 in 1 million, or demonstrate compliance with the SDAPCD's protocol for those sources with an increase in maximum incremental cancer risk at any receptor location of greater than 10 in 1 million but less than 100 in 1 million (SDAPCD 2017a).

The Project does not propose specific stationary sources that would generate TACs that are not commonly associated with residential and commercial development projects. If stationary sources with the potential to emit TACs were to be included as part of the Project, or at a later date, those sources would be subject to SDAPCD Rule 1200, and would be subject to New Source Review requirements.

SDAPCD Regulation XII: Toxic Air Contaminants; Rule 1210: Toxic Air Contaminant Public Health Risks –Public Notification and Risk Reduction. Requires each stationary source required to prepare a public risk assessment to provide written public notice of risks at or above the following levels: maximum incremental cancer risks equal to or greater than 10 in 1 million, cancer burden equal to or greater than 1.0, total acute noncancer health hazard index equal to or greater than 1.0, or total chronic noncancer health hazard index equal to or greater than 1.0 (SDAPCD 2017b).

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The Project does not propose specific stationary sources that would generate TACs. If stationary sources with the potential to emit TACs were to be included as part of the Project, or at a later date, those sources would be subject to SDAPCD Rule 1210 and would be subject to Public Notification and Risk Reduction requirements.

2.2.3.2 San Diego Association of Governments

SANDAG is the regional planning agency for the County and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. SANDAG serves as the federally designated metropolitan planning organization for the County. With respect to air quality planning and other regional issues, SANDAG has prepared *San Diego Forward: The Regional Plan* (Regional Plan) for the San Diego region (SANDAG 2015). The Regional Plan combines the big-picture vision for how the region will grow over the next 35 years with an implementation program to help make that vision a reality. The Regional Plan, including its Sustainable Communities Strategy (SCS), is built on an integrated set of public policies, strategies, and investments to maintain, manage, and improve the transportation system so that it meets the diverse needs of the San Diego region through 2050.

In regards to air quality, the Regional Plan sets the policy context in which SANDAG participates in and responds to the air district's air quality plans and builds off the air district's air quality plan processes that are designed to meet health-based criteria pollutant standards in several ways (SANDAG 2015). First, it complements air quality plans by providing guidance and incentives for public agencies to consider best practices that support the technology-based control measures in air quality plans. Second, the Regional Plan emphasizes the need for better coordination of land use and transportation planning, which heavily influences the emissions inventory from the transportation sectors of the economy. This also minimizes land use conflicts, such as residential development near freeways, industrial areas, or other sources of air pollution.

On September 23, 2016, SANDAG's Board of Directors adopted the final 2016 Regional Transportation Improvement Program. The 2016 Regional Transportation Improvement Program is a multi-billion dollar, multi-year program of proposed projects for major transportation projects in the San Diego region. Transportation projects funded with federal, state, and TransNet (the San Diego transportation sales tax program) must be included in an approved Regional Transportation Improvement Program. The programming of locally funded projects also may be programmed at the discretion of the agency. The 2016 Regional Transportation Improvement Program covers five fiscal years and incrementally implements the Regional Plan (SANDAG 2016).

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2.2.3.3 Carlsbad General Plan

In the Open Space, Conservation and Recreation Element of the Carlsbad General Plan, the City outlines in Chapter 4.8, Air Quality, the background of air quality in the region and the following objectives and policies related to air quality (City of Carlsbad 2015a):

- 4-G.13** Protect air quality within the city and support efforts for enhanced regional air quality.

The following policies related to air quality are found in Chapter 4.10 of the Conservation and Recreation Element in the Carlsbad General Plan:

- 4-P.52** Participate in the implementation of transportation demand management programs on a regional basis.
- 4-P.53** To the extent practical and feasible, maintain a system of air quality alerts (such as through the city website, internet, email to city employees, and other tools) based on San Diego Air Pollution Control District forecasts. Consider providing incentives to city employees to use alternative transportation modes during alert days.
- 4-P.54** Provide, whenever possible, incentives for carpooling, flex-time, shortened work weeks, and telecommunications and other means of reducing vehicular miles traveled.
- 4-P.55** Cooperate with the ongoing efforts of the U.S. Environmental Protection Agency, the San Diego Air Pollution Control District, and the State of California Air Resources Board in improving air quality in the regional air basin.
- 4-P.56** Ensure that construction and grading projects minimize short-term impacts to air quality.
- a. Require grading projects to provide a storm water pollution prevention plan (SWPPP) in compliance with city requirements, which include standards for best management practices that control pollutants from dust generated by construction activities and those related to vehicle and equipment cleaning, fueling and maintenance;
 - b. Require grading projects to undertake measures to minimize mono-nitrogen oxides (NO_x) emissions from vehicle and equipment operations; and
 - c. Monitor all construction to ensure that proper steps are implemented.

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2.3 Regional and Local Air Quality Conditions

2.3.1 San Diego Air Basin Attainment Designation

Pursuant to the 1990 federal CAA amendments, the EPA classifies air basins (or portions thereof) as “attainment” or “nonattainment” for each criteria air pollutant, based on whether the NAAQS have been achieved. Generally, if the recorded concentrations of a pollutant are lower than the standard, the area is classified as “attainment” for that pollutant. If an area exceeds the standard, the area is classified as “nonattainment” for that pollutant. If there is not enough data available to determine whether the standard is exceeded in an area, the area is designated as “unclassified” or “unclassifiable.” The designation of “unclassifiable/attainment” means that the area meets the standard or is expected to be meet the standard despite a lack of monitoring data. Areas that achieve the standards after a nonattainment designation are redesignated as maintenance areas and must have approved Maintenance Plans to ensure continued attainment of the standards. The California Clean Air Act, like its federal counterpart, called for the designation of areas as “attainment” or “nonattainment,” but based on CAAQS rather than the NAAQS. Table 2 depicts the current attainment status of the project site with respect to the NAAQS and CAAQS.

Table 2
San Diego Air Basin Attainment Classification

Pollutant	Designation/Classification	
	Federal Standards	State Standards
Ozone (O ₃) – 1 hour	Attainment ^a	Nonattainment
O ₃ (8-hour – 1997) (8-hour – 2008)	Attainment (maintenance) Nonattainment (moderate)	Nonattainment
Nitrogen Dioxide (NO ₂)	Unclassifiable/attainment	Attainment
Carbon Monoxide (CO)	Attainment (maintenance)	Attainment
Sulfur Dioxide (SO ₂)	Unclassifiable/attainment	Attainment
Coarse Particulate Matter (PM ₁₀)	Unclassifiable/attainment	Nonattainment
Fine Particulate Matter (PM _{2.5})	Unclassifiable/attainment	Nonattainment
Lead (Pb)	Unclassifiable/attainment	Attainment
Hydrogen Sulfide	No federal standard	Attainment
Sulfates	No federal standard	Unclassified
Visibility-Reducing Particles	No federal standard	Unclassified
Vinyl Chloride	No federal standard	No designation

Sources: EPA 2016c (federal); CARB 2016c (state).

Notes:

Attainment = meets the standards; Attainment/maintenance = achieve the standards after a nonattainment designation; Nonattainment = does not meet the standards; Unclassified or Unclassifiable = insufficient data to classify; Unclassifiable/attainment = meets the standard or is expected to be meet the standard despite a lack of monitoring data.

If nonattainment for Federal Standards, a clarifying classification will be provided indicating the severity of the nonattainment status.

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In summary, the SDAB is designated as an attainment area for the 1997 8-hour O₃ NAAQS and as a nonattainment area for the 2008 8-hour O₃ NAAQS. The SDAB is designated as a nonattainment area for O₃, PM₁₀, and PM_{2.5} CAAQS. The portion of the SDAB where the Project is located is designated as attainment or unclassifiable/unclassified for all other criteria pollutants under the NAAQS and CAAQS.

2.3.2 Local Ambient Air Quality

The Camp Pendleton monitoring station represents the closest monitoring station to the Project site for concentrations for O₃, PM_{2.5}, and NO₂. The Escondido monitoring station is the closest monitoring station for CO. The closest monitoring station for SO₂ is the El Cajon monitoring station. The San Diego–Kearny Villa Road monitoring station is the closest station monitoring for PM₁₀. Ambient concentrations of pollutants from 2016 through 2018 are presented in Table 3. The number of days exceeding the O₃, PM₁₀, and PM_{2.5} CAAQS and NAAQS is shown in Table 3. Air quality within the Project region was in compliance with both CAAQS and NAAQS for NO₂, CO, and SO₂ during this monitoring period.

Table 3
Local Ambient Air Quality Data

Monitoring Station	Unit	Averaging Time	Agency / Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
					2016	2017	2018	2016	2017	2018
Ozone (O ₃)										
Camp Pendleton	ppm	Maximum 1-hour concentration	State	0.09	0.083	0.094	0.084	0	0	0
	ppm	Maximum 8-hour concentration	State	0.070	0.073	0.082	0.069	5	5	0
			Federal	0.070	0.073	0.081	0.068	4	4	0
Nitrogen Dioxide (NO ₂)										
Camp Pendleton	ppm	Maximum 1-hour concentration	State	0.18	0.072	0.063	0.048	0	0	0
			Federal	0.100	0.072	0.063	0.048	0	0	0
	ppm	Annual concentration	State	0.030	0.006	0.006	0.006	0	0	0
			Federal	0.053	0.006	0.006	0.006	0	0	0
Carbon Monoxide (CO)										
Escondido ^a	ppm	Maximum 1-hour concentration	State	20	3.1	2.0	1.9	0	0	0
			Federal	35	3.1	2.0	1.9	0	0	0
	ppm	Maximum 8-hour concentration	State	9.0	2.0	1.5	1.4	0	0	0
			Federal	9	2.0	1.5	1.4	0	0	0
Sulfur Dioxide (SO ₂)										
El Cajon	ppm	Maximum 1-hour concentration	Federal	0.075	0.018	0.011	0.004	0	0	0
	ppm		State	0.04	0.0005	0.0004	0.0004	0	0	0

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Table 3
Local Ambient Air Quality Data

Monitoring Station	Unit	Averaging Time	Agency / Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
					2016	2017	2018	2016	2017	2018
		Maximum 24-hour concentration	Federal	0.140	0.0005	0.0004	0.0004	0	0	0
	ppm	Annual concentration	Federal	0.030	0.0001	0.0001	0.0001	—	—	—
<i>Coarse Particulate Matter (PM₁₀)^b</i>										
San Diego–Kearny Villa Road	μg/m ³	Maximum 24-hour concentration	State	50	35	47	38	0 (0)	0 (0)	0 (0)
			Federal	150	36	46	38	0 (0)	0 (0)	0 (0)
	μg/m ³	Annual concentration	State	20	ND	17.6	18.4	—	—	—
<i>Fine Particulate Matter (PM_{2.5})^b</i>										
Camp Pendleton	μg/m ³	Maximum 24-hour concentration	Federal	35	34.4	26.0	30.5	0 (0)	0 (0)	0 (0)
			State	12	9.7	—	—	—	—	—
	μg/m ³	Annual concentration	Federal	12.0	9.7	—	—	—	—	—

Sources: CARB 2020; EPA 2020.

Notes: ppm = parts per million; — = not available or applicable; μg/m³ = micrograms per cubic meter; ND = insufficient data available to determine the value.

Data taken from CARB iADAM (<http://www.arb.ca.gov/adam>) and EPA AirData (<http://www.epa.gov/airdata/>) represent the highest concentrations experienced over a given year.

Exceedances of federal and state standards are only shown for O₃ and particulate matter. Daily exceedances for particulate matter are estimated days because PM₁₀ and PM_{2.5} are not monitored daily. All other criteria pollutants did not exceed federal or state standards during the years shown. There is no federal standard for 1-hour O₃, annual PM₁₀, or 24-hour SO₂, nor is there a state 24-hour standard for PM_{2.5}.

The Camp Pendleton monitoring station is located at 21441-W B Street, Oceanside, California.

The Escondido monitoring station is located at 600 East Valley Pkwy, Escondido, California.

The El Cajon monitoring station is located at 10537 Floyd Smith Drive, El Cajon, California.

The San Diego–Kearny Villa monitoring station is located at 6123A Kearny Villa Road, San Diego, California.

The San Diego – Rancho Carmel Drive monitoring station is located at 11403 Rancho Carmel Drive, San Diego, California.

^a The 2016 and 2017 monitoring values are from the Escondido monitoring station and the 2018 monitoring values are from the Rancho Carmel Drive monitoring station.

^b Measurements of PM₁₀ and PM_{2.5} are usually collected every 6 days and every 1 to 3 days, respectively. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

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2.4 Significance Criteria and Methodology

2.4.1 Thresholds of Significance

The significance criteria used to evaluate the project impacts to air quality is based on the recommendations provided in Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For the purposes of this air quality analysis, a significant impact would occur if the project would (14 CCR 15000 et seq.):

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. 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.
3. Expose sensitive receptors to substantial pollutant concentrations.
4. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) indicates that, where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to determine whether the project would have a significant impact on air quality.

As part of its air quality permitting process, the SDAPCD has established thresholds in Rule 20.2 requiring the preparation of Air Quality Impact Assessments for permitted stationary sources (SDAPCD 2016c). The SDAPCD sets forth quantitative emissions thresholds below which a stationary source would not have a significant impact on ambient air quality. Project-related air quality impacts estimated in this environmental analysis would be considered significant if any of the applicable significance thresholds presented in Table 4 are exceeded.

Table 4
San Diego Air Pollution Control District Air Quality Significance Thresholds

Construction Emissions	
<i>Pollutant</i>	<i>Total Emissions (Pounds per Day)</i>
Respirable Particulate Matter (PM ₁₀)	100
Fine Particulate Matter (PM _{2.5})	55
Oxides of Nitrogen (NO _x)	250
Oxides of Sulfur (SO _x)	250
Carbon Monoxide (CO)	550
Volatile Organic Compounds (VOC)	75 ^a
Operational Emissions	

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Table 4
San Diego Air Pollution Control District Air Quality Significance Thresholds

<i>Pollutant</i>	<i>Total Emissions</i>		
	<i>Pounds per Hour</i>	<i>Pounds per Day</i>	<i>Tons per Year</i>
Respirable Particulate Matter (PM ₁₀)	—	100	15
Fine Particulate Matter (PM _{2.5})	—	55	10
Oxides of Nitrogen (NO _x)	25	250	40
Sulfur Oxides (SO _x)	25	250	40
Carbon Monoxide (CO)	100	550	100
Operational Emissions			
<i>Pollutant</i>	<i>Total Emissions</i>		
	<i>Pounds per Hour</i>	<i>Pounds per Day</i>	<i>Tons per Year</i>
Lead and Lead Compounds	—	3.2	0.6
Volatile Organic Compounds (VOC)	—	75*	13.7

Sources: San Diego Air Pollution Control District Rules 1501 (SDAPCD 1995) and 20.2(d)(2) (SDAPCD 2016b).

^a VOC threshold based on the threshold of significance for VOCs from the South Coast Air Quality Management District for the Coachella Valley as stated in the San Diego County Guidelines for Determining Significance.

The thresholds listed in Table 4 represent screening-level thresholds that can be used to evaluate whether Project-related emissions could cause a significant impact on air quality. Emissions below the screening-level thresholds would not cause a significant impact. For nonattainment pollutants, if emissions exceed the thresholds shown in Table 4, the Project could have the potential to result in a cumulatively considerable net increase in these pollutants and, thus, could have a significant impact on the ambient air quality.

With respect to odors, SDAPCD Rule 51 (Public Nuisance) prohibits emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person. A project that proposes a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors.

The SDAPCD *Supplemental Guidelines for Submission of Air Toxics “Hot Spots” Program Health Risk Assessments* provides guidance with which to perform HRAs within the SDAB. The current SDAPCD thresholds of significance for TAC emissions from the operations of both permitted and non-permitted sources are combined and are less than 10 in 1 million for cancer and less than 1 for the chronic hazard index (SDAPCD 2015c).

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2.4.2 Approach and Methodology

2.4.2.1 Construction

Emissions from the construction phase of the Project were estimated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2 (CAPCOA 2017).

As described in Section 1.2, Project Description, the Project would develop 252 townhomes, 46 age-restricted affordable single-family homes, a 4,000-square-foot restaurant pad, and a 6,000-square-foot retail pad on 20.65 acres. For the purposes of modeling, it was assumed that construction of the Project would commence in January 2021 and would last approximately 39 months, ending in March 2024. The analysis contained herein is based on the assumptions outlined in Table 5 (duration of phases is approximate). The Project schedule was based on information provided by the Project applicant.

Table 5
Construction Phasing Assumptions

Proposed Project Construction Phase	Construction Start Month/Year	Construction End Month/Year
Demo Structures & Improvements	01/2021	01/2021
Haul off Demo Debris	01/2021	01/2021
Clear & Grub	01/2021	01/2021
Remedial, Remedial & Mass Excavation	01/2021	03/2021
Export Excavation	03/2021	04/2021
Wet Utilities	03/2021	06/2021
Dry Utilities	06/2021	07/2021
Street Improvements – Balancing/Aggregate Base	07/2021	07/2021
Building Construction – 1	07/2021	12/2021
Street Improvements – Curb & Gutter	07/2021	08/2021
Street Improvements – Asphalt Paving	08/2021	08/2021
Street Improvements – Concrete Flatwork	08/2021	08/2021
Building Construction – 2	12/2021	08/2022
Architectural Coating	08/2022	05/2023
Building Construction – 3	05/2023	03/2024

Source: New Urban West Inc. 2018

The construction equipment mix used for estimating the construction emissions of the Project is based on information provided by the applicant and is shown in Table 6.

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Table 6
Construction Scenario Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Total Haul Truck Trips	Equipment Type	Quantity	Usage Hours
Demo Structures & Improvements	18	0	0	Excavators	1	8
				Off-Highway Trucks	1	6
				Off-Highway Trucks	1	8
				Rubber Tired Dozers	1	8
				Rubber Tired Loaders	1	8
				Skid Steer Loaders	1	8
Haul Off Demo Debris	6	0	440	Rubber Tired Loaders	1	8
Clear and Grub	12	0	0	Crawler Tractors	1	8
				Off-Highway Trucks	1	8
				Rubber Tired Loaders	1	8
Remedial, Remedial & Mass Excavation	26	0	0	Crawler Tractors	1	8
				Graders	1	6
				Off-Highway Trucks	1	8
				Rubber Tired Dozers	1	8
				Scrapers	4	8
Export Excavation	12	0	8,230	Graders	1	6
				Off-Highway Trucks	1	8
				Rubber Tired Dozers	1	8
				Rubber Tired Loaders	1	8
Wet Utilities	86	0	0	Excavators	2	8
				Off-Highway Trucks	2	8
				Rubber Tired Loaders	2	8
				Tractors/Loaders/Backhoes	2	4
Dry Utilities	32	0	0	Off-Highway Trucks	2	8
				Rubber Tired Loaders	2	8
				Tractors/Loaders/Backhoes	2	8
Street Improvements - Balancing/Aggregate Base	30	0	0	Graders	2	8
				Off-Highway Trucks	2	8
				Rollers	2	4
				Scrapers	2	8
				Tractors/Loaders/Backhoes	2	4
Building Construction – 1	12	2	8	Skid Steer Loaders	1	8
				Tractors/Loaders/Backhoes	1	8

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Table 6
Construction Scenario Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Total Haul Truck Trips	Equipment Type	Quantity	Usage Hours
Street Improvements - Curb & Gutter	40	0	0	Pavers	2	8
Street Improvements - Asphalt Paving	26	0	0	Graders	2	8
				Graders	2	4
				Pavers	2	8
				Rollers	2	6
Street Improvements - Concrete Flatwork	42	0	0	Tractors/Loaders/Backhoes	3	6
Building Construction – 2	14	0	0	Forklift	1	8
Architectural Coating	12	2	0	Air Compressors	1	8
				Cement and Mortar Mixers	1	8
				Pumps	1	8
Building Construction – 3	8	2	2	Forklift	1	8

Notes: See Appendix A for details.

For the analysis, it was generally assumed that heavy construction equipment would be operating at the site for approximately 5 days per week (22 days per month) during Project construction. The project has assumed all off-road construction equipment would be on average Tier 4 Interim or better³. The Project applicant provided construction worker trip estimates. Hauling trips were also included for the Project to account for soil import and export.

Construction of Project components would be subject to SDAPCD Rule 55, Fugitive Dust Control. This rule requires that construction of Project components include steps to restrict visible emissions of fugitive dust beyond the property line (SDAPCD 2009b). Compliance with Rule 55

³ For example, if a Tier 4 Interim piece of equipment is not reasonably available at the time of construction and a lower tier equipment is used instead (e.g., Tier 3), another piece of equipment could be upgraded from a Tier 4 Interim to a higher tier (i.e., Tier 4 Final) or replaced with an alternative-fueled (not diesel-fueled) equipment to offset the emissions associated with using a piece of equipment that does not meet Tier 4 Interim standards.

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would limit fugitive dust (PM₁₀ and PM_{2.5}) that may be generated during grading and construction activities.

A detailed depiction of the construction schedule—including information regarding subphases and equipment used during each subphase—is included in Appendix A of this report. The information contained in Appendix A was used as CalEEMod model inputs.

Health Risk Assessment

As a precautionary measure, a health risk assessment (HRA) was performed to assess the impact of construction on sensitive receptors proximate to the project. This report includes an HRA associated with emissions from construction of the project based on the methodologies prescribed in the Office of Environmental Health Hazard Assessment (OEHHA) *Air Toxics Hot Spots Program Risk Assessment Guidelines – Guidance Manual for Preparation of Health Risk Assessments* (OEHHA 2015). To implement the OEHHA Guidelines based on Project information, the SDAPCD has developed a three-tiered approach where each successive tier is progressively more refined, with fewer conservative assumptions. The SDAPCD *Supplemental Guidelines for Submission of Air Toxics “Hot Spots” Program Health Risk Assessments* provides guidance with which to perform HRAs within the SDAB (SDAPCD 2015b).

Health effects from carcinogenic air toxics are usually described in terms of cancer risk. The SDAPCD recommends a carcinogenic (cancer) risk threshold of 10 in a million. Additionally, some TACs increase non-cancer health risk due to long-term (chronic) exposures. The Chronic Hazard Index is the sum of the individual substance chronic hazard indices for all TACs affecting the same target organ system. The SDAPCD recommends a Chronic Hazard Index significance threshold of 1.0 (project increment). The exhaust from diesel engines is a complex mixture of gases, vapors, and particles, many of which are known human carcinogens. DPM has established cancer risk factors and relative exposure values for long-term chronic health hazard impacts. No short-term, acute relative exposure level has been established for DPM; therefore, acute impacts of DPM are not addressed in this assessment. This HRA evaluated the risk to future residents from diesel emissions from exhaust from onsite construction equipment and diesel haul and vendor trucks.

The dispersion modeling of DPM was performed using the American Meteorological Society/EPA Regulatory Model (AERMOD), which is the model SDAPCD requires for atmospheric dispersion of emissions. AERMOD is a steady-state Gaussian plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of surface and elevated sources, building downwash, and simple and complex terrain (EPA 2015). For the Project, AERMOD was run with all sources emitting unit emissions (1 gram per second) to obtain the “X/Q” values. X/Q is a dispersion factor that is the average effluent concentration

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normalized by source strength and is used as a way to simplify the representation of emissions from many sources. The X/Q values of ground-level concentrations were determined for construction emissions using AERMOD and the maximum concentrations determined for the 1-hour and Period averaging periods. Principal parameters of this modeling are presented in Table 7.

Table 7
AERMOD Principal Parameters

Parameter	Details
Meteorological Data	The latest 3-year meteorological data (2010–2012) for the Camp Pendleton Station (Station ID 3177) from SDAPCD were downloaded and then input to AERMOD. For cancer or chronic noncancer risk assessments, the average cancer risk of all years modeled was used.
Urban versus Rural Option	Urban areas typically have more surface roughness, as well as structures and low-albedo surfaces that absorb more sunlight—and thus more heat—relative to rural areas. However, based on the SDAPCD guidelines, the rural dispersion option was selected due to the Project's proximity to the ocean.
Terrain Characteristics	The terrain in the vicinity of the modeled Project site is generally flat. The elevation of the modeled site is about 103 feet above sea level. Digital elevation model files were imported into AERMOD so that complex terrain features were evaluated as appropriate.
Elevation Data	Digital elevation data were imported into AERMOD, and elevations were assigned to the emission sources and receptors. Digital elevation data were obtained through AERMOD View in the United States Geological Survey's National Elevation Dataset format with a 10-meter resolution.
Emission Sources and Release Parameters	Air dispersion modeling of DPM from construction equipment was conducted using emissions estimated using the CalEEMod, assuming emissions would occur 8 hours per day, 5 days per week. The Project area was modeled as a series of volume sources.
Source Release Characterizations	The source release height was assumed to be 5 meters with a vertical and horizontal dimension of 25 meters per volume source.
Discrete Receptors	A uniform Cartesian grid overlaying the project site with 20-meter resolution was converted into discrete Cartesian receptors to represent sensitive receptors.

Note: See Appendix B.

Dispersion model plotfiles from AERMOD were then imported into CARB's Hotspots Analysis and Reporting Program Version 2 to determine health risk, which requires peak 1-hour emission rates and annual-averaged emission rates for all pollutants for each modeling source. For the residential health risk, the HRA assumes exposure would start in the third trimester of pregnancy. Based on the HRA included in Appendix B, the maximally exposed individual resident would be located at the northeastern corner of the Project site. The results of the HRA are provided in Section 2.5.4, and detailed results and methodology are provided in Appendix B.

2.4.2.2 Operation

Emissions from the operational phase of the Project were estimated using CalEEMod. Operational year 2025 was assumed as it would be the first full year following completion of construction.

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Area Sources

CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use, architectural coatings, and landscape maintenance equipment. Emissions associated with natural gas usage in space heating and water heating are calculated in the building energy use module of CalEEMod, as described in the following text. The Project would not include fireplaces or wood stoves.

Consumer products are chemically formulated products used by household and institutional consumers, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Other paint products, furniture coatings, or architectural coatings are not considered consumer products (CAPCOA 2017). Consumer product VOC emissions are estimated in CalEEMod based on the floor area of buildings and on the default factor of pounds of VOC per building square foot per day. The CalEEMod default values for consumer products were assumed.

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings, such as in paints and primers used during building maintenance. CalEEMod calculates the VOC evaporative emissions from the application of surface coatings based on the VOC emission factor, the building square footage, the assumed fraction of surface area, and the reapplication rate. The VOC emissions factor is based on the VOC content of the surface coatings, and SDAPCD's Rule 67.0.1 (Architectural Coatings) governs the VOC content for interior and exterior coatings. This rule requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories (SDAPCD 2015b). The Project would use architectural coatings that would not exceed 50 grams per liter (g/L) for interior applications and 100 g/L for exterior applications. The model default reapplication rate of 10% of area per year is assumed. Consistent with CalEEMod defaults, it is assumed that the surface area for painting equals 2.7 times the floor square footage, with 75% assumed for interior coating and 25% assumed for exterior surface coating (CAPCOA 2017). CalEEMod defaults were assumed for the application of architectural coatings during operation, as that would not be controlled by the Project applicant.

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chainsaws, and hedge trimmers. The emissions associated with landscape equipment use are estimated based on CalEEMod default values for emission factors (grams per square foot of building space per day) and number of summer days (when landscape maintenance would generally be performed) and winter days. For

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San Diego County, the average annual number of summer days is estimated at 180 days (CAPCOA 2017).

Energy Sources

As represented in CalEEMod, energy sources include emissions associated with building electricity and natural gas usage. Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for GHGs in CalEEMod, since criteria pollutant emissions occur at the site of the power plant, which is typically off site.

Mobile Sources

Following the completion of construction activities, the Project would generate criteria pollutant emissions from mobile sources (vehicular traffic) as a result of the residents and patrons at the commercial uses of the Project. The maximum weekday trips (2,059 trips per day) were taken from the Traffic Impact Analysis for the Project (Linscott Law & Greenspan 2018). The estimated trip lengths and trip modes were based on CalEEMod defaults. The CalEEMod model was used to estimate emissions from proposed vehicular sources (refer to Appendix A). CalEEMod default data, including temperature, trip characteristics, variable start information, emissions factors, and trip distances were used for the model inputs. Project-related traffic was assumed to include a mixture of vehicles in accordance with the associated use, as modeled within the CalEEMod. Emission factors representing the vehicle mix and emissions for 2025 were used to estimate emissions associated with vehicular sources. The Project will also include bicycle parking for the commercial development.

The California Air Pollution Control Officers Association (CAPCOA) *Quantifying Greenhouse Gas Mitigation Measures* document was relied upon to apply land use and site enhancement mitigation within the CalEEMod (CAPCOA 2010). The following reduction measures were applied within the land use and site enhancement mitigation function within CalEEMod:

- Increased density: 14.43 dwelling units per acre (298 dwelling units / 20.65 acres)
- Increased diversity: mixed-use project.
- Increase transit accessibility: 0.04 mile to transit station
- Integrate below market rate housing: 15.4 % of dwelling units are below market rate (46 affordable units / 298 total units).

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2.5 Impact Analysis

2.5.1 Would the project conflict with or obstruct implementation of the applicable air quality plan?

As mentioned in Section 2.2.3, Local Regulations, the SDAPCD and SANDAG are responsible for developing and implementing the clean air plans for attainment and maintenance of the ambient air quality standards in the basin—specifically, the SIP and RAQS.⁴ The federal O₃ maintenance plan, which is part of the SIP, was adopted in 2012. The most recent O₃ attainment plan was adopted in 2016. The SIP includes a demonstration that current strategies and tactics will maintain acceptable air quality in the SDAB based on the NAAQS. The RAQS was initially adopted in 1991 and is updated on a triennial basis (most recently in 2016). The RAQS outlines SDAPCD's plans and control measures designed to attain the state air quality standards for O₃. The SIP and RAQS rely on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in the County as a whole and the cities in the County, to project future emissions and determine the strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population, vehicle trends, and land use plans developed by the County and the cities in the County as part of the development of their general plans.

If a project proposes development that is greater than that anticipated in the local plan and SANDAG's growth projections, the project might be in conflict with the SIP and RAQS and may contribute to a potentially significant cumulative impact on air quality. The Project is currently zoned as C-2-Q (General Neighborhood Commercial with Qualified Development Overlay) and RD-M (Residential Density – Multiple). The C-2-Q zone includes commercial and office uses providing convenience goods, personal services, and day-to-day living needs plus a wide range of retail, wholesale, and service uses, which requires a site development plan. The RD-M zone includes all types of residential dwellings over a broad range of densities. The Projects proposed restaurant and retail pads are consistent with the C-2-Q zoning and the residential portion of the Project is consistent with the RD-M zoning. Therefore, the Project is consistent with the land-use zoning for the site.

Implementation of the Project would result in an increase in 299 residential units. SANDAG's 2050 Regional Growth Forecast, adopted in October 2013, is the current growth forecast, and estimates that the City would have 45,171 housing units in 2012, 48,448 units in 2020, 50,261 units in 2035, and 50,505 units in 2050 (SANDAG 2013). This would equate to an additional

⁴ For the purpose of this discussion, the relevant federal air quality plan is the ozone maintenance plan (SDAPCD 2012). The RAQS is the applicable plan for purposes of state air quality planning. Both plans reflect growth projections in the SDAB.

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409 units per year from 2012 to 2020, 120 units per year from 2021 to 2035, and 16 units per year from 2036 through 2050. The Project is expected to bring 298 units to market in 2025. However, the units will be released to the public in phases as they are constructed and thus would be within SANDAG's growth projection for housing for that year. Therefore, the Project would not conflict with SANDAG's regional growth forecast for the City.

While the SDAPCD and City do not provide guidance regarding the analysis of impacts associated with air quality plan conformance, the County's *Guidelines for Determining Significance and Report and Format and Content Requirements – Air Quality* does discuss conformance with the RAQS (County of San Diego 2007). The guidance indicates that if a project, in conjunction with other projects, contributes to growth projections that would not exceed SANDAG's growth projections for the City, the project would not be in conflict with the RAQS (County of San Diego 2007). As previously discussed, this Project would not contribute to growth in the region that is not already accounted for. Therefore, impacts would be considered **less than significant**.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

The Project is less than significant prior to mitigation.

2.5.2 Would the Project 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?

Air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development, and SDAPCD develops and implements plans for future attainment of the NAAQS and CAAQS. Based on these considerations, project-level thresholds of significance for criteria pollutants are relevant in the determination of whether the Project's individual emissions would have a cumulatively significant impact on air quality.

Construction Emissions

Construction of the Project would result in the temporary addition of pollutants to the local airshed caused by on-site sources (i.e., off-road construction equipment, soil disturbance, and VOC off-gassing) and off-site sources (worker vehicle trips). Construction emissions can vary substantially

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day to day, depending on the level of activity, the specific type of operation, and for dust, the prevailing weather conditions.

Criteria air pollutant emissions associated with construction activity were quantified using CalEEMod. Default values provided by the program were used where detailed Project information was not available. A detailed depiction of the construction schedule—including information regarding phasing, equipment used during each phase, haul trucks, vendor trucks, and worker vehicles—is included in Section 2.4.2.1. The information contained in Appendix A was used as CalEEMod inputs.

Implementation of the Project would generate air pollutant emissions from entrained dust, off-road equipment, vehicle emissions, asphalt pavement application, and architectural coatings. Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM₁₀ and PM_{2.5} emissions. The Project is subject to SDAPCD Rule 55, Fugitive Dust Control. This rule requires that the Project take steps to restrict visible emissions of fugitive dust beyond the property line. Compliance with Rule 55 would limit fugitive dust (PM₁₀ and PM_{2.5}) generated during grading and construction activities. To account for dust control measures in the calculations, it was assumed that the active sites would be watered at least two times daily, resulting in an approximately 55% reduction of particulate matter.

Exhaust from internal combustion engines used by construction equipment and worker vehicles would result in emissions of VOC, NO_x, CO, SO_x, PM₁₀, and PM_{2.5}. The application of asphalt pavement and architectural coatings would also produce VOC emissions.

Table 8 shows the estimated maximum daily construction emissions associated with construction of the Project without mitigation. Complete details of the emissions calculations are provided in Appendix A of this document.

Table 8
Estimated Maximum Daily Construction Criteria Air Pollutant Emissions

Year	VOC	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
	<i>pounds per day</i>					
2021	5.49	126.12	121.37	0.42	14.04	5.28
2022	11.70	3.98	6.84	0.01	0.13	0.05
2023	11.69	3.94	6.82	0.01	0.13	0.05
2024	0.07	0.84	1.38	0.00	0.08	0.02
Maximum	11.70	126.12	121.37	0.42	14.04	5.28
SDAPCD Threshold	75	250	550	250	100	55
Threshold Exceeded?	No	No	No	No	No	No

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Notes:

VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM₁₀ = coarse particulate matter; PM_{2.5} = fine particulate matter; SDAPCD = San Diego Air Pollution Control District.

See Appendix A for complete results.

The values shown are the maximum summer or winter daily emissions results from CalEEMod. Although not considered mitigation, these emissions reflect the CalEEMod “mitigated” output, which accounts for the required compliance with SDAPCD Rule 55 (Fugitive Dust) and Rule 67.0.1 (Architectural Coatings).

As shown in Table 8, daily construction emissions would not exceed the significance thresholds for any criteria air pollutant. Therefore, impacts during construction would be **less than significant**.

Operational Emissions

Operation of the Project would generate VOC, NO_x, CO, SO_x, PM₁₀, and PM_{2.5} emissions from mobile sources, including vehicle trips; area sources, including the use of consumer products, and landscape maintenance equipment; and energy sources. As discussed in Section 2.4.2.2, Operation, pollutant emissions associated with long-term operations were quantified using CalEEMod. Project-generated mobile source emissions were estimated in CalEEMod based on Project-specific trip rates. CalEEMod default values were used to estimate emissions from the Project area and energy sources.

Table 9 presents the maximum daily area, energy, and mobile source emissions associated with operation (Year 2025) of the Project. The values shown are the maximum summer or winter daily emissions results from CalEEMod. Details of the emission calculations are provided in Appendix A.

Table 9
Estimated Maximum Daily Operational Criteria Air Pollutant Emissions

Emission Source	VOC	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
	<i>pounds per day</i>					
Area	8.00	0.28	24.57	0.00	0.14	0.14
Energy	0.08	0.69	0.35	0.00	0.06	0.06
Mobile	2.55	9.60	26.80	0.10	9.49	2.59
Total	10.63	10.57	51.72	0.10	9.69	2.79
<i>SDAPCD Threshold</i>	<i>75</i>	<i>250</i>	<i>550</i>	<i>250</i>	<i>100</i>	<i>55</i>
Threshold Exceeded?	No	No	No	No	No	No

Notes:

VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM₁₀ = coarse particulate matter; PM_{2.5} = fine particulate matter; SDAPCD = San Diego Air Pollution Control District.

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See Appendix A for complete results.

The values shown are the maximum summer or winter daily emissions results from CalEEMod. These emissions reflect the CalEEMod “mitigated” output, which accounts for compliance with SDAPCD Rule 67.0.1 (Architectural Coatings).

As shown in Table 9, the combined daily area, energy, and mobile source emissions would not exceed the SDAPCD’s operational thresholds for VOC, NO_x, CO, SO_x, PM₁₀, and PM_{2.5}.

Conclusion

The SDAB is a nonattainment area for O₃ under the NAAQS and CAAQS. The poor air quality in the SDAB is the result of cumulative emissions from motor vehicles, off-road equipment, commercial and industrial facilities, and other emission sources. Projects that emit these pollutants or their precursors (i.e., VOCs and NO_x for O₃) potentially contribute to poor air quality. In analyzing cumulative impacts from a project, the analysis must specifically evaluate the project’s contribution to the cumulative increase in pollutants for which the SDAB is designated as nonattainment for the CAAQS and NAAQS. If the project does not exceed thresholds and is determined to have less-than-significant project-specific impacts, it may still contribute to a significant cumulative impact on air quality if the emissions from the project, in combination with the emissions from other proposed or reasonably foreseeable future projects, are in excess of established thresholds. However, a project would only be considered to have a significant cumulative impact if the project’s contribution accounts for a significant proportion of the cumulative total emissions (i.e., it represents a “cumulatively considerable contribution” to the cumulative air quality impact).

Additionally, for the SDAB, the RAQS serves as the long-term regional air quality planning document for the purpose of assessing cumulative operational emissions in the basin to ensure the SDAB continues to make progress toward NAAQS- and CAAQS-attainment status. As such, cumulative projects located in the San Diego region would have the potential to result in a cumulative impact to air quality if, in combination, they would conflict with or obstruct implementation of the RAQS. Similarly, individual projects that are inconsistent with the regional planning documents upon which the RAQS is based would have the potential to result in cumulative operational impacts if they represent development and population increases beyond regional projections.

The SDAB has been designated as a federal nonattainment area for O₃ and a state nonattainment area for O₃, PM₁₀, and PM_{2.5}. The nonattainment status is the result of cumulative emissions from all sources of these air pollutants and their precursors within the basin. As discussed previously, the Project would not exceed significance thresholds during construction or operation. As such, the Project would result in less-than-significant impacts to air quality.

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Regarding long-term cumulative operational emissions in relation to consistency with local air quality plans, the SIP and RAQS serve as the primary air quality planning documents for the state and SDAB, respectively. The SIP and RAQS rely on SANDAG growth projections based on population, vehicle trends, and land use plans developed by the cities and the County as part of the development of their general plans. Therefore, projects that propose development that is consistent with the growth anticipated by local plans would be consistent with the SIP and RAQS and would not be considered to result in cumulatively considerable impacts from operational emissions. As stated previously, the Project would be consistent with the existing zoning and land use designation for the site and would not result in significant regional growth that is not accounted for within the RAQS. As a result, the Project would not result in a cumulatively considerable contribution to regional O₃ concentrations or other criteria pollutant emissions. Cumulative impacts would be less than significant during operation.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

The Project would have a less-than-significant impact prior to mitigation.

2.5.3 Would the project expose sensitive receptors to substantial pollutant concentrations?

Air quality varies as a direct function of the amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Air quality problems arise when the rate of pollutant emissions exceeds the rate of dispersion. Reduced visibility, eye irritation, and adverse health impacts upon those persons termed “sensitive receptors” are the most serious hazards of existing air quality conditions in the area. Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution, as identified by CARB, include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. As such, sensitive receptors include residences, schools, playgrounds, child-care centers, athletic facilities, long-term health-care facilities, rehabilitation centers, convalescent centers, and retirement homes. The closest sensitive receptors to the Project are residences adjacent to the south, western, and eastern property boundaries. The Project would also introduce new on-site sensitive receptors to the area.

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Health Impacts of Toxic Air Contaminants

“Incremental cancer risk” is the net increased likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a 9-, 30-, and 70-year exposure period would contract cancer based on the use of standard OEHHA risk-assessment methodology (OEHHA 2015). In addition, some TACs have non-carcinogenic effects. TACs that would potentially be emitted during construction activities would be DPM emitted from heavy-duty construction equipment and heavy-duty trucks. Heavy-duty construction equipment and diesel trucks are subject to CARB ATCMs to reduce DPM emissions. According to the OEHHA, HRAs should be based on a 30-year exposure duration based on typical residency period; however, such assessments should be limited to the period/duration of activities associated with the project (OEHHA 2015). Thus, the duration of proposed construction activities (approximately 39 months) would only constitute a small percentage of the total long-term exposure period and would not result in exposure of proximate sensitive receptors to substantial TACs. After construction is completed there would be no long-term source of TAC emissions during operation. The urban farm, which would be professionally managed, would be considered a land use that is commonly associated with odors due to the presence of fertilizers, pesticides, and herbicides. The urban farm will be completely organic and biodynamic which will significantly reduce the application of pesticides and fertilizers. The organic farm will be approximately 7,000 square feet and consist of raised beds. As the urban farm will apply pesticides and fertilizers in a very limited manner, TAC emissions related to the urban farm are minimal.

However, as a precautionary measure a HRA was performed to evaluate the risk from diesel exhaust emissions on existing sensitive receptors from construction activities. The HRA methodology was further described in Section 2.4.2.1, and the detailed assessment is provided in Appendix B. The results of the HRA for Project construction are summarized in Table 10.

Table 10
Construction Activity Health Risk Assessment Results

Impact Parameter	Units	Proposed Project Impact	CEQA Threshold	Level of Significance
Cancer Risk	Per Million	3.52	10.0	Less than significant
HIC	Not Applicable	0.002	1.0	Less than Significant

Sources: Appendix B

Notes: CEQA = California Environmental Quality Act; HIC = Chronic Hazard Index.

The results of the HRA demonstrate that the TAC exposure from construction diesel exhaust emissions would result in cancer risk on site below the 10 in 1 million threshold, as well as Chronic Hazard Index less than 1. Therefore, TAC emissions from operation of the Project would not expose sensitive receptors to substantial pollutant concentrations.

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Health Impacts of Carbon Monoxide

Mobile-source impacts occur on two basic scales of motion. Regionally, Project-related travel will add to regional trip generation and increase the vehicle miles traveled (VMT) within the local airshed and the SDAB. Locally, Project traffic will be added to the City's roadway system. If such traffic occurs during periods of poor atmospheric ventilation, consists of a large number of vehicles "cold-started" and operating at pollution-inefficient speeds, and operates on roadways already crowded with non-project traffic, there is a potential for the formation of microscale CO "hotspots" in the area immediately around points of congested traffic. Because of continued improvement in mobile emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the SDAB is steadily decreasing.

Projects contributing to adverse traffic impacts may result in the formation of CO hotspots. To verify that the Project would not cause or contribute to a violation of the CO standard, a screening evaluation of the potential for CO hotspots was conducted. A traffic impact analysis evaluated the level of service (LOS) (i.e., increased congestion) impacts at intersections affected by the Project (Linscott Law & Greenspan 2019). The potential for CO hotspots was evaluated based on the results of the traffic report. As the City does not have CO hotspot guidelines, the County of San Diego's Guidelines (County of San Diego 2007) CO hotspot screening guidance was followed to determine if the Project would require a site-specific hotspot analysis. The County recommends that a quantitative analysis of CO hotspots be performed for intersections operating at or below a LOS of "E" and have peak-hour trips exceeding 3,000 trips. The Project's traffic impact analysis determined that there would be no intersections that would operate at a LOS E or worse (Linscott Law & Greenspan 2019). Therefore, a quantitative analysis is not required for the Project.

Accordingly, the project would not cause or contribute to violations of the CAAQS and would not result in exposure of sensitive receptors to localized high concentrations of CO. As such, impacts would be less than significant to sensitive receptors with regard to potential CO hotspots resulting from project contribution to cumulative traffic-related air quality impacts, and no mitigation is required.

Health Impacts of Other Criteria Air Pollutants

Construction and operation of the Project would not result in emissions that exceed the SDAPCD's emission thresholds for any criteria air pollutants. Regarding VOCs, some VOCs would be associated with motor vehicles and construction equipment, while others are associated with architectural coatings, the emissions of which would not result in the exceedances of the SDAPCD's thresholds. Generally, the VOCs in architectural coatings are of relatively low toxicity. Additionally, SDAPCD Rule 67.0.1 restricts the VOC content of coatings for both construction and operational applications.

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In addition, VOCs and NO_x are precursors to O₃, for which the SDAB is designated as nonattainment with respect to the NAAQS and CAAQS (the SDAB is designated by the EPA as an attainment area for the 1-hour O₃ NAAQS standard and 1997 8-hour NAAQS standard). The health effects associated with O₃, as discussed in Section 2.1.2, are generally associated with reduced lung function. The contribution of VOCs and NO_x to regional ambient O₃ concentrations is the result of complex photochemistry. The increases in O₃ concentrations in the SDAB due to O₃ precursor emissions tend to be found downwind from the source location to allow time for the photochemical reactions to occur. However, the potential for exacerbating excessive O₃ concentrations would also depend on the time of year that the VOC emissions would occur, because exceedances of the O₃ AAQS tend to occur between April and October when solar radiation is highest.

The holistic effect of a single project's emissions of O₃ precursors is speculative due to the lack of quantitative methods to assess this impact. Nonetheless, the VOC and NO_x emissions associated with Project construction and operations could minimally contribute to regional O₃ concentrations and the associated health impacts. Due to the minimal contribution during construction and operation, as well as the existing good air quality in Coastal San Diego areas, health impacts would be considered less than significant.

Regarding NO₂, according to the construction emissions analysis, construction of the Proposed Project would not contribute to exceedances of the NAAQS and CAAQS for NO₂. As described in Section 2.1.2, health impacts from exposure to NO₂ and NO_x are associated with respiratory irritation, which may be experienced by nearby receptors during the periods of heaviest use of off-road construction equipment. However, these operations would be relatively short term. Additionally, off-road construction equipment would operate at various portions of the site and would not be concentrated in one portion of the site at any one time. Construction of the proposed Project would not require any stationary emission sources that would create substantial, localized NO_x impacts. Therefore, health impacts would be considered less than significant.

The VOC and NO_x emissions, as described previously, would minimally contribute to regional O₃ concentrations and its associated health effects. In addition to O₃, NO_x emissions would not contribute to potential exceedances of the NAAQS and CAAQS for NO₂. As shown in Table 3, the existing NO₂ concentrations in the area are well below the NAAQS and CAAQS standards. Thus, it is not expected that the Project's operational NO_x emissions would result in exceedances of the NO₂ standards or contribute to the associated health effects. CO tends to be a localized impact associated with congested intersections. The associated CO "hotspots" were discussed previously as a less-than-significant impact. Thus, the proposed Project's CO emissions would not contribute to significant health effects associated with this pollutant. PM₁₀ and PM_{2.5} would not contribute to potential exceedances of the NAAQS and CAAQS for particulate matter, would not

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obstruct the SDAB from coming into attainment for these pollutants, and would not contribute to significant health effects associated with particulates.

Based on the preceding considerations, health impacts associated with criteria air pollutants would be considered less than significant.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

The Project would have a less-than-significant impact prior to mitigation.

2.5.4 Would the project create objectionable odors affecting a substantial number of people?

The State of California Health and Safety Code, Division 26, Part 4, Chapter 3, Section 41700 and SDAPCD Rule 51, commonly referred to as public nuisance law, prohibits emissions from any source whatsoever in such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to the public health or damage to property. Projects required to obtain permits from SDAPCD are evaluated by SDAPCD staff for potential odor nuisance, and conditions may be applied (or control equipment required) where necessary to prevent occurrence of public nuisance.

SDAPCD Rule 51 (Public Nuisance) also prohibits emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person. A project that proposes a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors. Odor issues are very subjective by the nature of odors themselves and due to the fact that their measurements are difficult to quantify. As a result, this guideline is qualitative and will focus on the existing and potential surrounding uses and location of sensitive receptors.

The occurrence and severity of potential odor impacts depends on numerous factors: the nature, frequency, and intensity of the source; the wind speeds and direction; and the sensitivity of receiving location each contribute to the intensity of the impact. Although offensive odors seldom cause physical harm, they can be annoying, cause distress among the public, and generate citizen complaints.

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Odors would be potentially generated from vehicles and equipment exhaust emissions during construction of the Project. Potential odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, architectural coatings, and asphalt pavement application. Such odors would disperse rapidly from the Project site and generally occur at magnitudes that would not affect substantial numbers of people. Therefore, impacts associated with odors during construction would be less than significant.

Land uses and industrial operations associated with odor complaints include agricultural uses, wastewater treatment plants, food-processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding (SCAQMD 1993). The Project includes residential and commercial uses, as well as an on-site urban farm. The urban farm, which would be professionally managed, would be considered a land use that is commonly associated with odors due to the presence of fertilizers, pesticides, and herbicides. The urban farm was located as the furthest amenity from planned and existing residents, providing a buffer from any potential odors. The urban farm will be completely organic and biodynamic which will significantly reduce the application of pesticides and fertilizers. The organic farm will be approximately 7,000 square feet and consist of raised beds. As the urban farm will apply pesticides and fertilizers in a very limited manner, odors related to the urban farm are minimal. Therefore, Project operations would result in an odor impact that would be less than significant.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

The Project would have a less-than-significant impact prior to mitigation.

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3 GREENHOUSE GAS EMISSIONS

3.1 Environmental Setting

3.1.1 Climate Change Overview

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind patterns, lasting for an extended period of time (decades or longer). The Earth's temperature depends on the balance between energy entering and leaving the planet's system. Many factors, both natural and human, can cause changes in Earth's energy balance, including variations in the Sun's energy reaching Earth, changes in the reflectivity of Earth's atmosphere and surface, and changes in the greenhouse effect, which affects the amount of heat retained by Earth's atmosphere (EPA 2017a).

The greenhouse effect is the trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. 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 greenhouse gasses (GHGs) in the upper atmosphere absorb this long-wave radiation and emit it into space and toward the Earth. The greenhouse effect is a natural process that contributes to regulating the Earth's temperature and creates a pleasant, livable environment on the Earth. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and causing the Earth's surface temperature to rise.

The scientific record of the Earth's climate shows that the climate system varies naturally over a wide range of time scales and that, in general, climate changes prior to the Industrial Revolution in the 1700s can be explained by natural causes, such as changes in solar energy, volcanic eruptions, and natural changes in GHG concentrations. Recent climate changes, in particular the warming observed over the past century, however, cannot be explained by natural causes alone. Rather, it is extremely likely that human activities have been the dominant cause of that warming since the mid-20th century and is the most significant driver of observed climate change (IPCC 2013; EPA 2017a). Human influence on the climate system is evident from the increasing GHG concentrations in the atmosphere, positive radiative forcing, observed warming, and improved understanding of the climate system (IPCC 2013). The atmospheric concentrations of GHGs have increased to levels unprecedented in the last 800,000 years, primarily from fossil fuel emissions and secondarily from emissions associated with land use changes (IPCC 2013). Continued emissions of GHGs will cause further warming and changes in all components of the climate system, which is discussed further in Section 3.3.2, Potential Effects of Climate Change.

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3.1.2 Greenhouse Gases

A GHG is any gas that absorbs infrared radiation in the atmosphere; in other words, GHGs trap heat in the atmosphere. GHGs include, but are not limited to, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone (O₃), water vapor, hydrofluorocarbons (HFCs), hydrochlorofluorocarbons (HCFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆).⁵ Some GHGs, such as CO₂, CH₄, and N₂O, occur naturally and are emitted to the atmosphere through natural processes and human activities. Of these gases, CO₂ and CH₄ are emitted in the greatest quantities from human activities. Manufactured GHGs, which have a much greater heat-absorption potential than CO₂, include fluorinated gases, such as HFCs, HCFCs, PFCs, and SF₆, which are associated with certain industrial products and processes. A summary of the most common GHGs and their sources is included in the following text.⁶ Also included is a discussion of other climate-forcing substances.

Carbon Dioxide. CO₂ is a naturally occurring gas and a by-product of human activities and is the principal anthropogenic GHG that affects the Earth's radiative balance. Natural sources of CO₂ include respiration of bacteria, plants, animals, and fungus; evaporation from oceans; volcanic out-gassing; and decomposition of dead organic matter. Human activities that generate CO₂ are from the combustion of fuels, such as coal, oil, natural gas, and wood, and changes in land use.

Methane. CH₄ is produced through both natural and human activities. CH₄ is a flammable gas and is the main component of natural gas. Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide. N₂O is produced through natural and human activities, mainly through agricultural activities and natural biological processes, although fuel burning and other processes also create N₂O. Sources of N₂O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers, manure management, industrial processes (such as in nitric acid production, nylon production, and fossil-fuel-fired power plants), vehicle emissions, and using N₂O as a propellant (such as in rockets, race cars, and aerosol sprays).

Fluorinated Gases. Fluorinated gases (also referred to as F-gases) are synthetic powerful GHGs emitted from many industrial processes. Fluorinated gases are commonly used as substitutes for

⁵ California Health and Safety Code 38505 identifies seven GHGs that the CARB is responsible for monitoring and regulating to reduce emissions: CO₂, CH₄, N₂O, SF₆, HFCs, PFCs, and nitrogen trifluoride.

⁶ The descriptions of GHGs are summarized from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (1995), IPCC Fourth Assessment Report (2007), CARB's Glossary of Terms Used in GHG Inventories (2015), and the U.S. Environmental Protection Agency's (EPA's) Glossary of Climate Change Terms (2016f).

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stratospheric O₃-depleting substances (e.g., CFCs, HCFCs, and halons). The most prevalent fluorinated gases include the following:

- **Hydrofluorocarbons:** HFCs are compounds containing only hydrogen, fluorine, and carbon atoms. HFCs are synthetic chemicals used as alternatives to O₃-depleting substances in serving many industrial, commercial, and personal needs. HFCs are emitted as byproducts of industrial processes and are used in manufacturing.
- **Perfluorocarbons:** PFCs are a group of human-made chemicals composed of carbon and fluorine only. These chemicals were introduced as alternatives, with HFCs, to the O₃-depleting substances. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing. Since PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere, these chemicals have long lifetimes, ranging between 10,000 and 50,000 years.
- **Sulfur Hexafluoride:** SF₆ is a colorless gas soluble in alcohol and ether and slightly soluble in water. SF₆ is used for insulation in electric power transmission and distribution equipment, semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.
- **Nitrogen Trifluoride:** NF₃ is used in the manufacture of a variety of electronics, including semiconductors, and flat panel displays.

Chlorofluorocarbons. CFCs are synthetic chemicals that have been used as cleaning solvents, refrigerants, and aerosol propellants. CFCs are chemically unreactive in the lower atmosphere (troposphere), and the production of CFCs was prohibited in 1987 due to the chemical destruction of stratospheric O₃.

Hydrochlorofluorocarbons. HCFCs are a large group of compounds with a structure very close to that of CFCs—containing hydrogen, fluorine, chlorine, and carbon atoms—but including one or more hydrogen atoms. Like HFCs, HCFCs are used in refrigerants and propellants. HCFCs were also used in place of CFCs for some applications; however, their use in general is being phased out.

Black Carbon. Black carbon is a component of fine particulate matter (PM_{2.5}), which has been identified as a leading environmental risk factor for premature death. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation, influences cloud formation, and darkens the surface of snow and ice, which accelerates heat absorption and melting. Black carbon is a short-lived species that varies spatially, which makes it difficult to quantify the global warming potential (GWP). DPM emissions are a major source of black carbon and are TACs that have been regulated and controlled in California for several decades to protect public

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health. In relation to declining DPM from the CARB's regulations pertaining to diesel engines, diesel fuels, and burning activities, CARB estimates that annual black carbon emissions in California have reduced by 70% between 1990 and 2010, with 95% control expected by 2020 (CARB 2014a).

Water Vapor. The primary source of water vapor is evaporation from the ocean, with additional vapor generated by sublimation (change from solid to gas) from ice and snow, evaporation from other water bodies, and transpiration from plant leaves. Water vapor is the most important, abundant, and variable GHG in the atmosphere and maintains a climate necessary for life.

Ozone. Tropospheric O₃, which is created by photochemical reactions involving gases from both natural sources and human activities, acts as a GHG. Stratospheric O₃, which is created by the interaction between solar ultraviolet radiation and molecular oxygen (O₂), plays a decisive role in the stratospheric radiative balance. Depletion of stratospheric O₃, due to chemical reactions that may be enhanced by climate change, results in an increased ground-level flux of ultraviolet-B radiation.

Aerosols. Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light.

3.1.3 Global Warming Potential

Gases in the atmosphere can contribute to climate change both directly and indirectly. Direct effects occur when the gas itself absorbs radiation. Indirect radiative forcing occurs when chemical transformations of the substance produce other GHGs, when a gas influences the atmospheric lifetimes of other gases, and/or when a gas affects atmospheric processes that alter the radiative balance of the Earth (e.g., affect cloud formation or albedo) (EPA 2016e). The Intergovernmental Panel on Climate Change (IPCC) developed the GWP concept to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP of a GHG is defined as the ratio of the time-integrated radiative forcing from the instantaneous release of 1 kilogram of a trace substance relative to that of 1 kilogram of a reference gas (IPCC 2014). The reference gas used is CO₂; therefore, GWP-weighted emissions are measured in metric tons (MT) of carbon dioxide equivalent (CO₂e).

The current version of California Emissions Estimator Model (CalEEMod) (version 2016.3.2) assumes that the GWP for CH₄ is 25 (so emissions of 1 MT of CH₄ are equivalent to emissions of 25 MT of CO₂), and the GWP for N₂O is 298, based on the IPCC Fourth Assessment Report (IPCC 2007). The GWP values identified in CalEEMod were applied to the Project.

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3.2 Regulatory Setting

3.2.1 Federal Regulations

Massachusetts v. EPA. In *Massachusetts v. EPA* (April 2007), the U.S. Supreme Court directed the U.S. Environmental Protection Agency (EPA) administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In December 2009, the administrator signed a final rule with the following two distinct findings regarding GHGs under Section 202(a) of the federal Clean Air Act (CAA):

- The administrator found that elevated concentrations of GHGs—CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆—in the atmosphere threaten the public health and welfare of current and future generations. This is the “endangerment finding.”
- The administrator further found the combined emissions of GHGs—CO₂, CH₄, N₂O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is the “cause or contribute finding.”

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the CAA.

Energy Independence and Security Act. The Energy Independence and Security Act of 2007 (December 2007), among other key measures, would do the following, which would aid in the reduction of national GHG emissions (EPA 2007):

- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.
- Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020 and direct National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
- Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

Federal Vehicle Standards. In response to the U.S. Supreme Court ruling discussed above, the Bush Administration issued Executive Order (EO) 13432 in 2007 directing the EPA, the

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Department of Transportation, and the Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the NHTSA issued a final rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011, and in 2010, the EPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012–2016 (75 FR 25324–25728).

In 2010, President Obama issued a memorandum directing the Department of Transportation, Department of Energy, EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, the EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017–2025 light-duty vehicles. The proposed standards projected to achieve 163 grams/mile of CO₂ in model year 2025, on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017–2021 (77 FR 62624–63200), and NHTSA intends to set standards for model years 2022–2025 in a future rulemaking.

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011, the EPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014–2018. The standards for CO₂ emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to the EPA, this regulatory program will reduce GHG emissions and fuel consumption for the affected vehicles by 6%–23% over the 2010 baselines (76 FR 57106–57513).

In August 2016, the EPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018 through 2027 for certain trailers and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans, and all types of sizes of buses and work trucks. The final standards are expected to lower CO₂ emissions by approximately 1.1 billion MT and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program (EPA and NHTSA 2016).

On September 19, 2019, the NHTSA and the EPA issued a final action entitled the “One National Program Rule” to enable the federal government to provide nationwide uniform fuel economy and greenhouse gas emission standards for automobile and light-duty trucks (EPA 2019). This action finalizes critical parts of the Safer, Affordable, Fuel-Efficient (SAFE) Vehicles Rule that was first proposed in August 2018. This action makes clear that federal law preempts state and local tailpipe GHG emissions standards as well as zero emission vehicle (ZEV) mandates. California and other states have challenged federal actions that would delay or eliminate GHG reduction measures and

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have committed to cooperating with other countries to implement global climate change initiatives. The timing and consequences of these types of federal decisions and subsequent challenges are speculative at this time (CARB 2019a). Relatedly, CARB has not determined at this time what impacts the SAFE rule may have on GHG emissions.

3.2.2 State Regulations

The statewide GHG emissions regulatory framework is summarized below by category: state climate change targets, building energy, renewable energy and energy procurement, mobile sources, solid waste, water, and other state regulations and goals. The following text describes EOs, legislation, regulations, and other plans and policies that would directly or indirectly reduce GHG emissions and/or address climate change issues.

State Climate Change Targets

EO S-3-05. EO S-3-05 (June 2005) established the following statewide goals: GHG emissions should be reduced to 2000 levels by 2010; GHG emissions should be reduced to 1990 levels by 2020; and GHG emissions should be reduced to 80% below 1990 levels by 2050.

Assembly Bill 32 and CARB's Climate Change Scoping Plan. In furtherance of the goals established in EO S-3-05, the Legislature enacted Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020.

Under AB 32, CARB is responsible for and is recognized as having the expertise to carry out and develop the programs and requirements necessary to achieve the GHG emissions reduction mandate of AB 32. Under AB 32, CARB must adopt regulations requiring the reporting and verification of statewide GHG emissions from specified sources. This program is used to monitor and enforce compliance with established standards. CARB also is required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 relatedly authorized CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted.

In 2007, CARB approved a limit on the statewide GHG emissions level for year 2020 consistent with the determined 1990 baseline (427 MMT CO₂e). CARB's adoption of this limit is in accordance with Health and Safety Code Section 38550.

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Further, in 2008, CARB adopted the *Climate Change Scoping Plan: A Framework for Change* (Scoping Plan) in accordance with Health and Safety Code Section 38561. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions for various emission sources/sectors to 1990 levels by 2020. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction features by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. The key elements of the Scoping Plan include the following (CARB 2008):

1. Expanding and strengthening existing energy efficiency programs, as well as building and appliance standards.
2. Achieving a statewide renewable energy mix of 33%.
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California's GHG emissions.
4. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.
5. Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard.
6. Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation.

In the Scoping Plan, CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of approximately 28.5% from the otherwise projected 2020 emissions level; i.e., those emissions that would occur in 2020, absent GHG-reducing laws and regulations (referred to as "Business-As-Usual"). For purposes of calculating this percent reduction, CARB assumed that all new electricity generation would be supplied by natural gas plants; no further regulatory action would impact vehicle fuel efficiency; and building energy efficiency codes would be held at 2005 standards.

In the 2011 Final Supplement to the Scoping Plan's Functional Equivalent Document, CARB revised its estimates of the projected 2020 emissions level in light of the economic recession and the availability of updated information about GHG reduction regulations. Based on the new economic data, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of 21.7% (down from 28.5%) from the Business-As-Usual conditions. When the

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2020 emissions level projection also was updated to account for newly implemented regulatory measures, including Pavley I (model years 2009–2016) and the Renewables Portfolio Standard (RPS; CPUC 2015; 12% to 20%), CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of 16% (down from 28.5%) from the Business-As-Usual conditions.

More recently, in 2014, CARB adopted the *First Update to the Climate Change Scoping Plan: Building on the Framework* (First Update). The stated purpose of the First Update is to “highlight California’s success to date in reducing its GHG emissions and lay the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80% below 1990 levels by 2050” (CARB 2014b). The First Update found that California is on track to meet the 2020 emissions reduction mandate established by AB 32 and noted that California could reduce emissions further by 2030 to levels squarely in line with those needed to stay on track to reduce emissions to 80% below 1990 levels by 2050 if the state realizes the expected benefits of existing policy goals.

In conjunction with the First Update, CARB identified “six key focus areas comprising major components of the state’s economy to evaluate and describe the larger transformative actions that will be needed to meet the state’s more expansive emission reduction needs by 2050” (CARB 2014b). Those six areas are: (1) energy; (2) transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure); (3) agriculture; (4) water; (5) waste management; and (6) natural and working lands. The First Update identifies key recommended actions for each sector that will facilitate achievement of EO S-3-05’s 2050 reduction goal.

CARB’s research efforts presented in the First Update indicate that it has a “strong sense of the mix of technologies needed to reduce emissions through 2050” (CARB 2014b). Those technologies include energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies.

As part of the First Update, CARB recalculated the state’s 1990 emissions level using more recent GWPs identified by the IPCC. Using the recalculated 1990 emissions level (431 MMT CO₂e) and the revised 2020 emissions level projection identified in the 2011 Final Supplement, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of approximately 15% (instead of 28.5% or 16%) from the Business-As-Usual conditions.

On January 20, 2017, CARB released The *2017 Climate Change Scoping Plan Update* (Second Update) for public review and comment (CARB 2017b). This update presents CARB’s strategy

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for achieving the state's 2030 GHG target as established in SB 32 (discussed below), including continuing the Cap-and-Trade Program through 2030, and includes a new approach to reduce GHGs from refineries by 20%. The Second Update incorporates approaches to cutting short-lived climate pollutants (SLCPs) under the Short-Lived Climate Pollutant Reduction Strategy (a planning document that was adopted by CARB in March 2017) and acknowledges the need for reducing emissions in agriculture and highlights the work underway to ensure that California's natural and working lands increasingly sequester carbon. During development of the Second Update, CARB held a number of public workshops in the Natural and Working Lands, Agriculture, Energy, and Transportation sectors to inform development of the 2030 Scoping Plan Update (CARB 2017b). When discussing project-level GHG emissions reduction actions and thresholds, the Second Update states "achieving no net increase in GHG emissions is the correct overall objective, but it may not be appropriate or feasible for every development project. An inability to mitigate a project's GHG emissions to zero does not necessarily imply a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA" (CARB 2017b). The Final Proposed Scoping Plan Update was adopted by CARB's Governing Board on December 14, 2017.

EO B-30-15. EO B-30-15 (April 2015) identified an interim GHG reduction target in support of targets previously identified under S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing statewide GHG emissions to 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing statewide GHG emissions to 80% below 1990 levels by 2050 as set forth in S-3-05. To facilitate achievement of this goal, EO B-30-15 calls for an update to CARB's Scoping Plan to express the 2030 target in terms of MMT CO₂e. The EO also calls for state agencies to continue to develop and implement GHG emission reduction programs in support of the reduction targets. EO B-30-15 does not require local agencies to take any action to meet the new interim GHG reduction target.

SB 32 and AB 197. SB 32 and AB 197 (enacted in 2016) are companion bills that set a new statewide GHG reduction targets, make changes to CARB's membership and increase legislative oversight of CARB's climate change-based activities, and expand dissemination of GHG and other air quality-related emissions data to enhance transparency and accountability. More specifically, SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40% below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, in order to provide ongoing oversight over implementation of the state's climate policies. AB 197 also added two members of the Legislature to CARB as nonvoting members; requires CARB to make available and update (at least annually via its website) emissions data for GHGs, criteria air pollutants, and TACs from

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reporting facilities; and, requires CARB to identify specific information for GHG emissions reduction measures when updating the Scoping Plan.

SB 605 and SB 1383. SB 605 (2014) requires CARB to complete a comprehensive strategy to reduce emissions of SLCPs in the state, and SB 1383 (2016) requires CARB to approve and implement that strategy by January 1, 2018. SB 1383 also establishes specific targets for the reduction of SLCPs (40% below 2013 levels by 2030 for CH₄ and HFCs and 50% below 2013 levels by 2030 for anthropogenic black carbon) and provides direction for reductions from dairy and livestock operations and landfills. Accordingly, and as mentioned above, CARB adopted its *Short-Lived Climate Pollutant Reduction Strategy* (SLCP Reduction Strategy) in March 2017. The SLCP Reduction Strategy establishes a framework for the statewide reduction of emissions of black carbon, CH₄, and fluorinated gases.

EO B-55-18

EO B-55-18 (September 2018) established a new statewide goal “to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter.” This executive order directed CARB to “work with relevant state agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal.”

Building Energy

Title 24, Part 6. Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California’s building standards. While not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically establishes Building Energy Efficiency Standards that are designed to ensure new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed every few years by the Building Standards Commission and the California Energy Commission (CEC) (and revised if necessary) (California Public Resources Code, Section 25402(b)(1)). The regulations receive input from members of industry, as well as the public, with the goal of “reducing of wasteful, uneconomic, inefficient, or unnecessary consumption of energy” (California Public Resources Code, Section 25402). These regulations are carefully scrutinized and analyzed for technological and economic feasibility (California Public Resources Code, Section 25402(d)) and cost effectiveness (California Public Resources Code, Sections 25402(b)(2) and (b)(3)). These standards are updated to consider and incorporate new energy-efficient technologies and construction methods. As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment.

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The 2019 Title 24 standards are the currently applicable building energy efficiency standards, and became effective on January 1, 2020. In general, single-family residences built to the 2019 standards are anticipated to use approximately 7% less energy due to energy efficiency measures than those built to the 2016 standards; once rooftop solar electricity generation is factored in, single-family residences built under the 2019 standards will use approximately 53% less energy than those under the 2016 standards (CEC 2018a). Nonresidential buildings built to the 2019 standards are anticipated to use an estimated 30% less energy than those built to the 2016 standards (CEC 2018a).

Title 24, Part 11. In addition to the CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (CALGreen 2016) is commonly referred to as CALGreen and establishes minimum mandatory standards as well as voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The CALGreen standards took effect in January 2011 and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential and state-owned buildings and schools and hospitals. The CALGreen 2016 standards became effective on January 1, 2017. The mandatory standards require the following (CALGreen 2016):

- Mandatory reduction in indoor water use through compliance with specified flow rates for plumbing fixtures and fittings.
- Mandatory reduction in outdoor water use through compliance with a local water efficient landscaping ordinance or the California Department of Water Resources' Model Water Efficient Landscape Ordinance.
- 65% of construction and demolition waste must be diverted from landfills.
- Mandatory inspections of energy systems to ensure optimal working efficiency.
- Inclusion of electric vehicle charging stations or designated spaces capable of supporting future charging stations.
- Low-pollutant emitting exterior and interior finish materials, such as paints, carpets, vinyl flooring, and particle boards.

The CALGreen standards also include voluntary efficiency measures that are provided at two separate tiers and implemented at the discretion of local agencies and applicants. CALGreen's Tier 1 standards call for a 15% improvement in energy requirements, stricter water conservation, 65% diversion of construction and demolition waste, 10% recycled content in building materials, 20% permeable paving, 20% cement reduction, and cool/solar-reflective roofs. CALGreen's more

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rigorous Tier 2 standards call for a 30% improvement in energy requirements, stricter water conservation, 75% diversion of construction and demolition waste, 15% recycled content in building materials, 30% permeable paving, 25% cement reduction, and cool/solar-reflective roofs.

Title 20. Title 20 of the California Code of Regulations requires manufacturers of appliances to meet state and federal standards for energy and water efficiency. Performance of appliances must be certified through the CEC to demonstrate compliance with standards. New appliances regulated under Title 20 include refrigerators, refrigerator-freezers, and freezers; room air conditioners and room air-conditioning heat pumps; central air conditioners; spot air conditioners; vented gas space heaters; gas pool heaters; plumbing fittings and plumbing fixtures; fluorescent lamp ballasts; lamps; emergency lighting; traffic signal modules; dishwashers; clothes washers and dryers; cooking products; electric motors; low voltage dry-type distribution transformers; power supplies; televisions and consumer audio and video equipment; and battery charger systems. Title 20 presents protocols for testing for each type of appliance covered under the regulations, and appliances must meet the standards for energy performance, energy design, water performance, and water design. Title 20 contains three types of standards for appliances: federal and state standards for federally regulated appliances, state standards for federally regulated appliances, and state standards for non-federally regulated appliances.

SB 1. SB 1 (2006) established a \$3 billion rebate program to support the goal of the state to install rooftop solar energy systems with a generation capacity of 3,000 megawatts through 2016. SB 1 added sections to the Public Resources Code, including Chapter 8.8 (California Solar Initiative), that require building projects applying for ratepayer-funded incentives for photovoltaic systems to meet minimum energy efficiency levels and performance requirements. Section 25780 established that it is a goal of the state to establish a self-sufficient solar industry in which solar energy systems are a viable mainstream option for both homes and businesses within 10 years of adoption and to place solar energy systems on 50% of new homes within 13 years of adoption. SB 1, also termed “GoSolarCalifornia,” was previously titled “Million Solar Roofs.”

AB 1470. This bill established the Solar Water Heating and Efficiency Act of 2007. The bill makes findings and declarations of the Legislature relating to the promotion of solar water heating systems and other technologies that reduce natural gas demand. The bill defines several terms for purposes of the act. The bill requires the commission to evaluate the data available from a specified pilot program and, if it makes a specified determination, to design and implement a program of incentives for the installation of 200,000 solar water heating systems in homes and businesses throughout the state by 2017.

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AB 1109. Enacted in 2007, AB 1109 required the CEC to adopt minimum energy efficiency standards for general purpose lighting, to reduce electricity consumption 50% for indoor residential lighting and 25% for indoor commercial lighting.

Renewable Energy and Energy Procurement

SB 1078. SB 1078 (2002) established the RPS program, which requires an annual increase in renewable generation by the utilities equivalent to at least 1% of sales, with an aggregate goal of 20% by 2017. This goal was subsequently accelerated, requiring utilities to obtain 20% of their power from renewable sources by 2010.

SB 1368. SB 1368 (2006) requires the CEC to develop and adopt regulations for GHG emission performance standards for the long-term procurement of electricity by local publicly owned utilities. These standards must be consistent with the standards adopted by the CPUC. This effort will help protect energy customers from financial risks associated with investments in carbon-intensive generation by allowing new capital investments in power plants for which GHG emissions are as low as or lower than new combined-cycle natural gas plants by requiring imported electricity to meet GHG performance standards in California and by requiring that the standards be developed and adopted in a public process.

SB X1 2. SB X1 2 (2011) expanded the RPS by establishing that 20% of the total electricity sold to retail customers in California per year by December 31, 2013, and 33% by December 31, 2020, and in subsequent years be secured from qualifying renewable energy sources. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current and that meets other specified requirements with respect to its location. In addition to the retail sellers previously covered by the RPS, SB X1 2 added local, publicly owned electric utilities to the RPS.

SB 350. SB 350 (2015) further expanded the RPS by establishing that 50% of the total electricity sold to retail customers in California per year by December 31, 2030, be secured from qualifying renewable energy sources. In addition, SB 350 includes the goal to double the energy efficiency savings in electricity and natural gas final end uses (such as heating, cooling, lighting, or class of energy uses on which an energy-efficiency program is focused) of retail customers through energy conservation and efficiency. The bill also requires the CPUC, in consultation with the CEC, to establish efficiency targets for electrical and gas corporations consistent with this goal.

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SB 100

SB 100 (2018) increased the standards set forth in SB 350 establishing that 44% of the total electricity sold to retail customers in California per year by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030, be secured from qualifying renewable energy sources. Under SB 100, it is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100% of the retail sales of electricity to California. This bill requires that the achievement of 100% zero-carbon electricity resources does not increase the carbon emissions elsewhere in the western grid and that the achievement not occur through resource shuffling.

Mobile Sources

SB 743. Governor Brown signed Senate Bill (SB) 743 (Steinberg, 2013), which creates a process to change the way that transportation impacts are analyzed under CEQA. Specifically, SB 743 requires OPR to amend the CEQA Guidelines to provide an alternative to LOS for evaluating transportation impacts. Particularly within areas served by transit, those alternative criteria must “promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.” (Public Resources Code Section 21099(b)(1).) Measurements of transportation impacts may include “vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated.” (Ibid.) Once the CEQA Guidelines are amended to include those alternative criteria, auto delay will no longer be considered a significant impact under CEQA. (Id. at subd. (b)(2).) OPR recommends that a per capita or per employee VMT that is fifteen percent below that of existing development may be a reasonable threshold. Moreover, a fifteen percent reduction is consistent with SB 743’s direction to OPR to select a threshold that will help the State achieve its climate goals.

AB 1493. In a response to the transportation sector accounting for more than half of California’s CO₂ emissions, AB 1493 was enacted in July 2002. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles that are primarily used for noncommercial personal transportation in the state. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. When fully phased in, the near-term (2009–2012) standards will result in a reduction of about 22% in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term (2013–2016) standards will result in a reduction of about 30%.

EO S-1-07. Issued on January 18, 2007, EO S-1-07 sets a declining Low Carbon Fuel Standard for GHG emissions measured in CO₂e grams per unit of fuel energy sold in California. The target

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of the Low Carbon Fuel Standard is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020. The carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel, including extraction/feedstock production, processing, transportation, and final consumption, per unit of energy delivered. CARB adopted the implementing regulation in April 2009. The regulation is expected to increase the production of biofuels, including those from alternative sources, such as algae, wood, and agricultural waste.

SB 375. SB 375 (2008) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 required CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035. Regional metropolitan planning organizations are then responsible for preparing a Sustainable Communities Strategy (SCS) within their Regional Transportation Plan (RTP). The goal of the SCS is to establish a forecasted development pattern for the region that, after considering transportation measures and policies, will achieve, if feasible, the GHG reduction targets. If an SCS is unable to achieve the GHG reduction target, a metropolitan planning organization must prepare an Alternative Planning Strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

Pursuant to Government Code Section 65080(b)(2)(K), an SCS does not: (1) regulate the use of land; (2) supersede the land use authority of cities and counties; or (3) require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with it. Nonetheless, SB 375 makes regional and local planning agencies responsible for developing those strategies as part of the federally required metropolitan transportation planning process and the state-mandated housing element process.

In 2010, CARB adopted the first round of SB 375 targets for the regional MPOs. The original targets for SANDAG are a 7% reduction in emissions per capita by 2020 and a 13% reduction by 2035. In March 2018, CARB adopted updated SB 375 targets for the regional MPOs. The updated targets for SANDAG are a 15% reduction in emissions per capita by 2020 and a 19% reduction by 2035. The reduction targets are expressed as a percent change in per capita passenger vehicle GHG emissions relative to 2005 levels.

SANDAG completed and adopted its *2050 Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS) in October 2011 (SANDAG 2011). In November 2011, CARB, by resolution, accepted SANDAG's GHG emissions quantification analysis and determination that, if implemented, the SCS would achieve CARB's 2020 and 2035 GHG emissions reduction targets for the region.

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After SANDAG's 2050 RTP/SCS was adopted, a lawsuit was filed by the Cleveland National Forest Foundation and others. The matter is pending before the California Supreme Court (Case No. S223603) for determination of whether an environmental impact report for an RTP must include an analysis of the plan's consistency with the GHG reduction goals reflected in EO S-3-05 to comply with the California Environmental Quality Act (CEQA).

Although the environmental impact report for SANDAG's 2050 RTP/SCS is pending before the California Supreme Court, in 2015, SANDAG adopted the next iteration of its RTP/SCS in accordance with statutorily mandated timelines, and no subsequent litigation challenge was filed. More specifically, in October 2015, SANDAG adopted *San Diego Forward: The Regional Plan*. Like the 2050 RTP/SCS, this planning document meets CARB's 2020 and 2035 reduction targets for the region (SANDAG 2015). In December 2015, CARB, by resolution, accepted SANDAG's GHG emissions quantification analysis and determination that, if implemented, the SCS would achieve CARB's 2020 and 2035 GHG emissions reduction targets for the region.

Advanced Clean Cars Program. In January 2012, CARB approved the Advanced Clean Cars program, a new emissions-control program for model years 2015 through 2025. The program combines the control of smog- and soot-causing pollutants and GHG emissions into a single coordinated package. The package includes elements to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean cars (CARB 2011). To improve air quality, CARB has implemented new emissions standards to reduce smog-forming emissions beginning with 2015 model year vehicles. It is estimated that, in 2025, cars will emit 75% less smog-forming pollution than the average new car sold before 2012. To reduce GHG emissions, CARB, in conjunction with the EPA and the NHTSA, has adopted new GHG standards for model year 2017 to 2025 vehicles; the new standards are estimated to reduce GHG emissions by 34% in 2025. The Zero-Emissions Vehicle (ZEV) program will act as the focused technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles in the 2018 to 2025 model years. The Clean Fuels Outlet regulation will ensure that fuels such as electricity and hydrogen are available to meet the fueling needs of the new advanced technology vehicles as they come to the market.

EO B-16-12. EO B-16-12 (2012) directs state entities under the governor's direction and control to support and facilitate development and distribution ZEVs. This EO also sets a long-term target of reaching 1.5 million ZEVs on California's roadways by 2025. On a statewide basis, EO B-16-12 also establishes a GHG emissions reduction target from the transportation sector equaling 80% less than 1990 levels by 2050. In furtherance of this EO, the Governor convened an Interagency Working Group on ZEVs that has published multiple reports regarding the progress made on the penetration of ZEVs in the statewide vehicle fleet.

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AB 1236. AB 1236 (2015) as enacted in California’s Planning and Zoning Law, requires local land use jurisdictions to approve applications for the installation of electric vehicle charging stations, as defined, through the issuance of specified permits, unless there is substantial evidence in the record that the proposed installation would have a specific, adverse impact on public health or safety and there is no feasible method to satisfactorily mitigate or avoid the specific, adverse impact. The bill provides for appeal of that decision to the planning commission, as specified. The bill requires local land use jurisdictions with a population of 200,000 or more residents to adopt an ordinance by September 30, 2016, that creates an expedited and streamlined permitting process for electric vehicle charging stations, as specified. Prior to this statutory deadline, in August 2016, the County Board of Supervisors adopted Ordinance No. 10437 (N.S.) adding a section to its County Code related to the expedited processing of electric vehicle charging stations permits consistent with AB 1236.

SB 350. In 2015, SB 350—the Clean Energy and Pollution Reduction Act—was enacted into law. As one of its elements, SB 350 establishes a statewide policy for widespread electrification of the transportation sector, recognizing that such electrification is required for achievement of the state’s 2030 and 2050 reduction targets (see Public Utilities Code Section 740.12).

EO B-48-18

EO B-48-18 (2018) launched an eight-year initiative to accelerate the sale of EVs through a mix of rebate programs and infrastructure improvements. The order also set a new EV target of 5 million EVs in California by 2030. EO B-48-18 included funding for multiple state agencies, including the CEC, to increase EV charging infrastructure and for CARB to provide rebates for the purchase of new EVs and purchase incentives for low-income customers.

Solid Waste

AB 939 and AB 341. In 1989, AB 939, known as the Integrated Waste Management Act (Public Resources Code Sections 40000 et seq.), was passed because of the increase in waste stream and the decrease in landfill capacity. The statute established the California Integrated Waste Management Board, which oversees a disposal reporting system. AB 939 mandated a reduction of waste being disposed where jurisdictions were required to meet diversion goals of all solid waste through source reduction, recycling, and composting activities of 25% by 1995 and 50% by the year 2000.

AB 341 (2011) amended the California Integrated Waste Management Act of 1989 to include a provision declaring that it is the policy goal of the state that not less than 75% of solid waste generated be source-reduced, recycled, or composted by the year 2020 and annually thereafter. In

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addition, AB 341 required the California Department of Resources Recycling and Recovery (CalRecycle) to develop strategies to achieve the state's policy goal. CalRecycle has conducted multiple workshops and published documents that identify priority strategies that CalRecycle believes would assist the state in reaching the 75% goal by 2020.

Water

EO B-29-15. In response to the ongoing drought in California, EO B-29-15 (April 2015) set a goal of achieving a statewide reduction in potable urban water usage of 25% relative to water use in 2013. The term of the EO extended through February 28, 2016, although many of the directives have since become permanent water-efficiency standards and requirements. The EO includes specific directives that set strict limits on water usage in the state. In response to EO B-29-15, the California Department of Water Resources has modified and adopted a revised version of the Model Water Efficient Landscape Ordinance that, among other changes, significantly increases the requirements for landscape water use efficiency and broadens its applicability to include new development projects with smaller landscape areas.

Other State Regulations and Goals

SB 97. SB 97 (Dutton) (August 2007) directed the Governor's Office of Planning and Research to develop guidelines under CEQA for the mitigation of GHG emissions. In 2008, the Office of Planning and Research issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents. The advisory indicated that the lead agency should identify and estimate a project's GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities (OPR 2008). The advisory further recommended that the lead agency determine significance of the impacts and impose all mitigation measures necessary to reduce GHG emissions to a level that is less than significant. The California Natural Resources Agency adopted the CEQA Guidelines amendments in December 2009, which became effective in March 2010.

Under the amended CEQA Guidelines, a lead agency has the discretion to determine whether to use a quantitative or qualitative analysis or apply performance standards to determine the significance of GHG emissions resulting from a particular project (14 CCR 15064.4(a)). The Guidelines require a lead agency to consider the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4(b)). The Guidelines also allow a lead agency to consider feasible means of mitigating the significant effects of GHG emissions, including reductions in emissions through the implementation of project features or off-site measures. The adopted amendments do not establish a GHG emission threshold, instead allowing

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a lead agency to develop, adopt, and apply its own thresholds of significance or those developed by other agencies or experts. The California Natural Resources Agency also acknowledges that a lead agency may consider compliance with regulations or requirements implementing AB 32 in determining the significance of a project's GHG emissions (CNRA 2009a).

With respect to GHG emissions, the CEQA Guidelines state in Section 15064.4(a) that lead agencies should “make a good faith effort, to the extent possible on scientific and factual data, to describe, calculate or estimate” GHG emissions. The CEQA Guidelines note that an agency may identify emissions by either selecting a “model or methodology” to quantify the emissions or by relying on “qualitative analysis or other performance based standards” (14 CCR 15064.4(a)). Section 15064.4(b) states that the lead agency should consider the following when assessing the significance of impacts from GHG emissions on the environment: (1) the extent a project may increase or reduce GHG emissions as compared to the existing environmental setting; (2) whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and (3) the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4(b)).

EO S-13-08. EO S-13-08 (November 2008) is intended to hasten California's response to the impacts of global climate change, particularly sea-level rise. Therefore, the EO directs state agencies to take specified actions to assess and plan for such impacts. The final *2009 California Climate Adaptation Strategy* report was issued in December 2009 (CNRA 2009a), and an update, *Safeguarding California: Reducing Climate Risk*, followed in July 2014 (CNRA 2014). To assess the state's vulnerability, the report summarizes key climate change impacts to the state for the following areas: Agriculture, Biodiversity and Habitat, Emergency Management, Energy, Forestry, Ocean and Coastal Ecosystems and Resources, Public Health, Transportation, and Water. Issuance of the *Safeguarding California: Implementation Action Plans* followed in March 2016 (CNRA 2016). Presently, a draft of the *Safeguarding California Plan: 2017 Update* is being prepared to communicate current and needed actions that the state government should take to build climate change resiliency (CNRA 2017).

3.2.3 Local Regulations

3.2.3.1 San Diego Air Pollution Control District

The SDAPCD does not have established GHG rules, regulations, or policies.

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3.2.3.2 City of Carlsbad

City of Carlsbad General Plan

The State of California requires cities and counties to prepare and adopt a general plan to set out a long-range vision and comprehensive policy framework for its future. The State also mandates that the general plan be updated periodically to ensure relevance and utility. The *City of Carlsbad General Plan* (General Plan) was unanimously adopted by the City Council on September 22, 2015. The General Plan builds upon many of the goals and strategies of the former 1994 General Plan, in addition to offering new policy direction in the areas of urban form, neighborhood character, historic preservation, public facilities, recreation, conservation, mobility, housing affordability, economic prosperity, and equitable development. It also outlines the plan amendment process, and other implementation strategies, and considers the continued growth of the City beyond the year 2020 (City of Carlsbad 2015a).

Sustainability Element. The Sustainability Element provides the overarching framework and includes policies focused on topics central to sustainability not covered elsewhere. This element provides the overarching framework for sustainability in the City and outlines policies focused on:

- Climate change and GHG reduction;
- Water conservation, recycling, and supply;
- Green building;
- Sustainable energy and energy security; and
- Sustainable food.

The Sustainability Element is closely tied to the City's Community Vision Core Value 6- Sustainability, which aims to build on the City's sustainability initiatives to emerge as a leader in green development and sustainability, and pursue public/ private partnerships, particularly on sustainable water, energy, recycling, and foods. The following goals identified in the Sustainability Element support reduction of GHG emissions in the City:

- **9-G.2:** Undertake initiatives to enhance sustainability by reducing the community's GHG emissions and fostering green development patterns—including buildings, sites, and landscapes.
- **9-G.3:** Promote energy efficiency and conservation in the community.

The following policies identified in the Sustainability Element support reduction of GHG emissions in the City:

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- **9-P.1:** Enforce the Climate Action Plan as the city's strategy to reduce greenhouse gas emissions.
- **9-P.2:** Continue efforts to decrease use of energy and fossil fuel consumption in municipal operations, including transportation, waste reduction and recycling, and efficient building design and use.

The Sustainability Element also identifies policies for water conservation, recycling, and supply; green building; sustainable energy; and sustainable food.

City of Carlsbad Climate Action Plan

The *City of Carlsbad Climate Action Plan* (CAP) was unanimously adopted by the City Council on September 22, 2015 (City of Carlsbad 2015b). The CAP is designed to reduce the City's GHG emissions and streamline environmental review of future development projects in the city in accordance with the California Environmental Quality Act (CEQA).

The CAP includes goals, policies, and actions for the City to reduce GHG emissions and combat climate change and includes: an inventory of citywide and local government GHG emissions; forecasts of future citywide and local government GHG emissions; a comprehensive, citywide strategy and actions to manage and reduce GHG emissions, with emission targets through 2035; and actions that demonstrate the City's commitment to achieve state GHG reduction targets by creating enforceable measures, and monitoring and reporting processes to ensure targets are met. The timeframe for the CAP extends from the date of adoption through 2035. The CAP is considered a qualified plan as described in CEQA Guidelines Section 15183.5(b).

The CAP is intended to be a tool for policy makers, community members and others to guide the implementation of actions that limit the City's GHG emissions. Ensuring that the mitigation measures in the CAP translate from policy language to on-the-ground results is critical to the success of the CAP.

On January 13, 2020 the City Attorney's office released a memorandum (as presented within the January 21, 2020 City Council Agenda materials) detailing that an error was found with the VMT calculation used in the CAP (City of Carlsbad 2020). The memorandum concluded that due to the VMT estimation error, the emissions forecasts for 2020 and 2035 were no longer accurate and the City may not meet the GHG targets for those years. Further, it concluded that the CAP was no longer considered a qualified GHG reduction plan under CEQA Guidelines Section 15183.5 and could not be used to tier off for determining significance.

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City of Carlsbad Electric Vehicle Charging Ordinance No. CS-349

In 2011, as part of the Climate Action Plan development process, the City of Carlsbad conducted analysis of citywide greenhouse gas emissions, which showed that 39% of the City's greenhouse gas emissions come from cars and trucks. In 2015, the City adopted its Climate Action Plan (as discussed above), which included a goal to increase the amount of zero-emission vehicle miles traveled from 15% to 25% of total vehicle miles traveled by 2035. This ordinance supports this goal by providing zero-emission vehicle parking and electric vehicle charging in new construction and major residential renovations. The measures included in this ordinance align with the requirements of the California Green Building Code and have been proven to be cost-effective when compared to a later retrofit. The ordinance took effect on April 11, 2019. Projects that meet the ordinance criteria and have not applied for a building permit by the effectiveness date will be subject to its requirements.

City of Carlsbad Water Heating Ordinance No. CS-348

The City of Carlsbad's Climate Action Plan also seeks to reduce greenhouse gas emissions by promoting the installation of solar water heaters or heat pumps. In pursuit of the goals established by the Climate Action Plan, the City has adopted a water-heating ordinance, which requires cost-effective water heating measures to be included on all new construction projects. Developers of all new low-rise residential construction projects need to install non-gas water heating equipment in their projects. The residential water-heating ordinance requires new low-rise residential buildings to install cost-effective water heating measures. Required measures include a water heating system that meets one of the following requirements:

- Heat pump water heater, or other form of electric water heating system, that meets California Energy Code (Title 24, Part 6) standards and is paired with a ≥ 0.3 KW (300W) photovoltaic system; or
- Solar water heating system that is OG-300 certified and includes ≥ 40 sq. ft. of collectors or provides a 0.6 solar fraction.

3.3 Greenhouse Gas Inventories and Climate Change Conditions

3.3.1 Sources of Greenhouse Gas Emissions

Global Inventory

Anthropogenic GHG emissions worldwide in 2017 (the most recent year for which data is available) totaled approximately 50,860 MMT of CO₂e, excluding land use change and forestry (Olivier and Peters 2018). Six countries—China, the United States, the Russian Federation, India, Japan, and Brazil—and the European community accounted for approximately 65% of the total

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global emissions, or approximately 33,290 MMT CO₂e (Olivier and Peters 2018). Table 11 presents the top GHG-emissions-producing countries, as well as the European Union.

Table 11
Six Top GHG Producer Countries and the European Union

Emitting Countries	2014 GHG Emissions (MMT CO ₂ e) ^{a,b}
China	13,530
United States	6,640
European Union	4,560
India	3,650
Russian Federation	2,220
Japan	1,490
Brazil	1,200
Total	33,290

Source: Olivier and Peters 2018.

Notes: MMT CO₂e = million metric tons of carbon dioxide equivalent.

^a Column may not add due to rounding.

^b GHG emissions do not include land use change and forestry-related GHG emissions.

National and State Inventories

Per the 2019 EPA Inventory of U.S. GHG Emissions and Sinks: 1990–2017, total U.S. GHG emissions were approximately 6,457 MMT CO₂e in 2017 (EPA 2019). The primary GHG emitted by human activities in the United States was CO₂, which represented approximately 81.6% of total GHG emissions (6,457 MMT CO₂e). The largest source of CO₂, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 93.2% of CO₂ emissions in 2017 (4,912.0 MMT CO₂e). Relative to the 1990 emissions level, gross U.S. GHG emissions in 2017 were 1.3% higher; however, the gross emissions were down from a high of 15.7% above the 1990 level that occurred in 2007. GHG emissions decreased from 2016 to 2017 by 0.5% (35.5 MMT CO₂e) and, overall, net emissions in 2017 were 13% below 2005 levels (EPA 2019).

According to California's 2000 through 2016 GHG emissions inventory (2018 edition), California emitted 429 MMT CO₂e in 2016, including emissions resulting from out-of-state electrical generation (CARB 2018). The sources of GHG emissions in California include transportation, industry, electric power production from both in-state and out-of-state sources, residential and commercial activities, agriculture, high GWP substances, and recycling and waste. The California GHG emission source categories and their relative contributions in 2016 are presented in Table 12.

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Table 12
GHG Emissions Sources in California

Source Category	Annual GHG Emissions (MMT CO ₂ e)	Percent of Total*
Transportation	176.1	41%
Industrial	98.8	23%
Electricity (in state)	42.9	10%
Electricity (imports)	25.8	6%
Agriculture	34.4	8%
Residential	30.1	7%
Commercial	21.5	5%
Total	429.4	100%

Source: CARB 2018.

Notes: GHG = greenhouse gas; MMT CO₂e = million metric tons of carbon dioxide equivalent.

* Column may not add due to rounding.

Between 2000 and 2016, per-capita GHG emissions in California dropped from a peak of 14 MT per person in 2001 to 10.8 MT per person in 2016, representing a 23% decrease. In addition, total GHG emissions in 2015 were approximately 12 MMT CO₂e less than 2015 emissions (CARB 2018).

According to the GHG inventory data compiled by the Energy Policy Initiative Center, in 2010, the County (as defined to include all cities therein and unincorporated County areas) emitted 34.7 MMT CO₂e (EPIC 2015). As outlined in Table 3, San Diego County GHG Emissions by Sectors, on-road transportation created 37% of these emissions. Similar to emissions trends statewide, electricity generation is the second biggest emitter.

Table 13
San Diego County GHG Emissions by Sectors

Source Category	Annual GHG Emissions (MMT CO ₂ e)	Percent of Total
On-road transportation	13.14	37.2
Electricity generation	7.97	22.6
Natural gas end uses	2.84	8.0
Heavy Duty Trucks & Vehicles	1.89	5.4
Solid Waste	1.75	4.9
Other Fuels	1.64	4.6
Industrial	1.43	4.1
Aviation	1.37	3.9
Off-Road	0.92	2.6
Wildfire	0.81	2.3
Other – Thermal Cogeneration	0.64	1.8

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Table 13
San Diego County GHG Emissions by Sectors

Source Category	Annual GHG Emissions (MMT CO ₂ e)	Percent of Total
Water	0.52	1.5
Wastewater	0.16	0.5
Rail	0.11	0.3
Agriculture	0.08	0.2
Marine Vessels	0.05	0.1
Development and Sequestration	(0.65)	N/A
Total	34.67	100

Source: EPIC 2015.

Notes: GHG = greenhouse gas; MMT CO₂e = million metric tons of carbon dioxide equivalent per year

The 2012 emissions inventory for the City is shown in Table 14 below.

Table 14
City GHG Emissions by Sectors

Source Category	Annual GHG Emissions (MT CO ₂ e)	Percent of Total
On-road transportation ¹	488,000	49.9
Electricity	301,000	30.8
Natural gas	134,000	13.7
Solid Waste	25,000	2.6
Off-Road Transportation ²	14,000	1.4
Water	12,000	1.2
Wastewater	3,000	0.3
Total	977,000	100

Source: Grim, pers. Comm. 2020

Notes: GHG emissions for each category are rounded. Sums may not add up to totals due to rounding.

¹ Based on SANDAG Series 13 vehicle miles traveled estimates. 2012 is the Series 13 Base Year.

² This category includes emissions from the off-road equipment sub-categories as identified in the Carlsbad CAP (lawn and garden, construction, industrial, and light commercial equipment). The sub-categories do not include all off-road vehicles and equipment.

3.3.2 Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. The 2014 *Intergovernmental Panel on Climate Change Synthesis Report* indicated that warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. Signs that global climate change has occurred include warming of the atmosphere and ocean, diminished amounts of snow and ice, and rising sea levels (IPCC 2014).

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In California, climate change impacts have the potential to affect sea level rise, agriculture, snowpack and water supply, forestry, wildfire risk, public health, and electricity demand and supply (CCCC 2006). The primary effect of global climate change has been a 0.2° Celsius (°C) rise in average global tropospheric temperature per decade, determined from meteorological measurements worldwide between 1990 and 2005. Scientific modeling predicts that continued emissions of GHGs at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. A warming of about 0.2°C (0.36° Fahrenheit (°F)) per decade is projected, and there are identifiable signs that global warming could be taking place.

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. The average temperatures in California have increased, leading to more extreme hot days and fewer cold nights; shifts in the water cycle have been observed, with less winter precipitation falling as snow, and both snowmelt and rainwater running off earlier in the year; sea levels have risen; and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (CAT 2010).

An increase in annual average temperature is a reasonably foreseeable effect of climate change. Observed changes over the last several decades across the Western United States reveal clear signals of climate change. Statewide average temperatures increased by about 1.7°F from 1895 to 2011, and warming has been the greatest in the Sierra Nevada (CCCC 2012). By 2050, California is projected to warm by approximately 2.7°F above 2000 averages, a threefold increase in the rate of warming over the last century. By 2100, average temperatures could increase by 4.1 to 8.6°F, depending on emissions levels. Springtime warming—a critical influence on snowmelt—will be particularly pronounced. Summer temperatures will rise more than winter temperatures, and the increases will be greater in inland California, compared to the coast. Heat waves will be more frequent, hotter, and longer. There will be fewer extremely cold nights (CCCC 2012). A decline of Sierra snowpack, which accounts for approximately half of the surface water storage in California and much of the state's water supply, by 30% to as much as 90% is predicted over the next 100 years (CAT 2006).

Model projections for precipitation over California continue to show the Mediterranean pattern of wet winters and dry summers with seasonal, year-to-year, and decade-to-decade variability. For the first time, however, several of the improved climate models shift toward drier conditions by the mid-to-late 21st century in Central and, most notably, Southern California. By late-century, all projections show drying, and half of them suggest 30-year average precipitation will decline by more than 10% below the historical average (CCCC 2012).

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A summary of current and future climate change impacts to resource areas in California, as discussed in the *Safeguarding California: Reducing Climate Risk* (CNRA 2014), is provided below.

Agriculture. The impacts of climate change on the agricultural sector are far more severe than the typical variability in weather and precipitation patterns that occur year to year. The agriculture sector and farmers face some specific challenges that include more drastic and unpredictable precipitation and weather patterns; extreme weather events that range from severe flooding and extreme drought to destructive storm events; significant shifts in water availability and water quality; changes in pollinator lifecycles; temperature fluctuations, including extreme heat stress and decreased chill hours; increased risks from invasive species and weeds, agricultural pests, and plant diseases; and disruptions to the transportation and energy infrastructure supporting agricultural production. These challenges and associated short-term and long-term impacts can have both positive and negative effects on agricultural production. Nonetheless, it is predicted that current crop and livestock production will suffer long-term negative effects resulting in a substantial decrease in the agricultural sector if not managed or mitigated.

Biodiversity and Habitat. The state's extensive biodiversity stems from its varied climate and assorted landscapes, which have resulted in numerous habitats where species have evolved and adapted over time. Specific climate change challenges to biodiversity and habitat include species migration in response to climatic changes, range shift and novel combinations of species; pathogens, parasites, and disease; invasive species; extinction risks; changes in the timing of seasonal life-cycle events; food web disruptions; and threshold effects (i.e., a change in the ecosystem that results in a "tipping point" beyond which irreversible damage or loss has occurred). Habitat restoration, conservation, and resource management across California and through collaborative efforts among public, private, and nonprofit agencies has assisted in the effort to fight climate change impacts on biodiversity and habitat. One of the key measures in these efforts is ensuring species' ability to relocate as temperature and water availability fluctuate as a result of climate change based on geographic region.

Energy. The energy sector provides California residents with a supply of reliable and affordable energy through a complex integrated system. Specific climate change challenges for the energy sector include temperature, fluctuating precipitation patterns, increasing extreme weather events, and sea level rise. Increasing temperatures and reduced snowpack negatively impact the availability of a steady flow of snowmelt to hydroelectric reservoirs. Higher temperatures also reduce the capacity of thermal power plants, since power plant cooling is less efficient at higher ambient temperatures. Increased temperatures will also increase electricity demand associated with air conditioning. Natural gas infrastructure in Coastal California is threatened by sea level rise and extreme storm events.

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Forestry. Forests occupy approximately 33% of California's 100 million acres and provide key benefits, such as wildlife habitat, absorption of CO₂, renewable energy, and building materials. The most significant climate change-related risks to forests are accelerated risk of wildfire and more frequent and severe droughts. Droughts have resulted in more large-scale mortalities and, combined with increasing temperatures, have led to an overall increase in wildfire risks. Increased wildfire intensity subsequently increases public safety risks, property damage, fire suppression and emergency response costs, watershed and water quality impacts, and vegetation conversions. These factors contribute to decreased forest growth, geographic shifts in tree distribution, loss of fish and wildlife habitat, and decreased carbon absorption. Climate change may result in increased establishment of non-native species, particularly in rangelands where invasive species are already a problem. Invasive species may be able to exploit temperature or precipitation changes or quickly occupy areas denuded by fire, insect mortality, or other climate change effects on vegetation.

Ocean and Coastal Ecosystems and Resources. Sea level rise, changing ocean conditions, and other climate change stressors are likely to exacerbate long-standing challenges related to ocean and coastal ecosystems in addition to threatening people and infrastructure located along the California coastline and in coastal communities. Sea level rise, in addition to more frequent and severe coastal storms and erosion, are threatening vital infrastructure, such as roads, bridges, power plants, ports and airports, gasoline pipes, and emergency facilities, as well as negatively impacting the coastal recreational assets, such as beaches and tidal wetlands. Water quality and ocean acidification threaten the abundance of seafood and other plant and wildlife habitats throughout California and globally.

Public Health. Climate change can impact public health through various environmental changes and is the largest threat to human health in the 21st century. Changes in precipitation patterns affect public health primarily through potential for altered water supplies, and extreme events, such as heat, floods, droughts, and wildfires. Increased frequency, intensity, and duration of extreme heat and heat waves is likely to increase the risk of mortality due to heat-related illness, as well as exacerbate existing chronic health conditions. Other extreme weather events are likely to negatively impact air quality and increase or intensify respiratory illness, such as asthma and allergies. Additional health impacts that may be impacted by climate change include cardiovascular disease, vector-borne diseases, mental health impacts, and malnutrition injuries. Increased frequency of these ailments is likely to subsequently increase the direct risk of injury and/or mortality.

Transportation. Residents of California rely on airports, seaports, public transportation, and an extensive roadway network to gain access to destinations, goods, and services. While the transportation industry is a source of GHG emissions, it is also vulnerable to climate change risks. Particularly, sea level rise and erosion threaten many coastal California roadways, airports,

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seaports, transit systems, bridge supports, and energy and fueling infrastructure. Increasing temperatures and extended periods of extreme heat threaten the integrity of the roadways and rail lines. High temperatures cause the road surfaces to expand, which leads to increased pressure and pavement buckling. High temperatures can also cause rail breakages, which could lead to train derailment. Other forms of extreme weather events, such as extreme storm events, can negatively impact infrastructure, which can impair movement of peoples and goods, or potentially block evacuation routes and emergency access roads. Increased wildfires, flooding, erosion risks, landslides, mudslides, and rockslides can all profoundly impact the transportation system and pose a serious risk to public safety.

Water. Water resources in California support residences, plants, wildlife, farmland, landscapes, and ecosystems and bring trillions of dollars in economic activity. Climate change could seriously impact the timing, form, amount of precipitation, runoff patterns, and frequency and severity of precipitation events. Higher temperatures reduce the amount of snowpack and lead to earlier snowmelt, which can impact water supply availability, natural ecosystems, and winter recreation. Water supply availability during the intense dry summer months is heavily dependent on the snowpack accumulated during the winter. Increased risk of flooding has a variety of public health concerns, including water quality, public safety, property damage, displacement, and post-disaster mental health problems. Prolonged and intensified droughts can also negatively affect groundwater reserves and result in increased overdraft and subsidence. Droughts can also negatively impact agriculture and farmland throughout the state. The higher risk of wildfires can lead to increased erosion, which can negatively impact watersheds and result in poor water quality. Water temperatures are also prone to increase, which can negatively impact wildlife that rely on a specific range of temperatures for suitable habitat.

In May 2017, the California Natural Resources Agency (CNRA) released the draft *Safeguarding California Plan: 2017 Update*, which is a survey of current programmatic responses for climate change and contains recommendations for further actions (CNRA 2017).

3.4 Significance Criteria and Methodology

3.4.1 Thresholds of Significance

The significance criteria used to evaluate the Project's GHG emissions impacts are based on the recommendations provided in Appendix G of the CEQA Guidelines. For the purposes of this GHG emissions analysis, the Project would have a significant environmental impact if it would (14 CCR 15000 et seq.):

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

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2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

The Appendix G thresholds for GHGs do not prescribe specific methodologies for performing an assessment, do not establish specific quantitative thresholds, and do not mandate specific mitigation measures. Rather, the CEQA Guidelines emphasize the lead agency's discretion to determine the appropriate methodologies and thresholds of significance consistent with the manner in which other impact areas are handled in CEQA (CNRA 2009a). Additional guidance regarding assessment of GHGs is discussed below.

CEQA Guidelines

With respect to GHG emissions, the CEQA Guidelines Section 15064.4(a) states that lead agencies “shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate” GHG emissions resulting from a project. The CEQA Guidelines note that an agency has the discretion to either quantify a project's greenhouse gas emissions or rely on a “qualitative analysis or other performance based standards” (14 CCR 15064.4[a]). A lead agency may use a “model or methodology” to estimate greenhouse gas emissions and has the discretion to select the model or methodology it considers “most appropriate to enable decision makers to intelligently take into account the project's incremental contribution to climate change” (14 CCR 15064.4[c]). The CEQA Guidelines provide that the lead agency should consider the following when determining the significance of impacts from GHG emissions on the environment (14 CCR 15064.4[b]):

1. The extent a project may increase or reduce GHG emissions as compared to the existing environmental setting.
2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

In addition, the CEQA Guidelines specify that “[w]hen adopting or using thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence” (14 CCR 15064.7[c]).

Governor's Office of Planning and Research Guidance

The Governor's Office of Planning and Research technical advisory titled, CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA)

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Review, states that “public agencies are encouraged but not required to adopt thresholds of significance for environmental impacts. Even in the absence of clearly defined thresholds for GHG emissions, the law requires that such emissions from CEQA projects must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact” (OPR 2008). Furthermore, the advisory document indicates that “in the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a ‘significant impact,’ individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice” (OPR 2008).

Cumulative Nature of Climate Change

Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHGs. There are currently no established thresholds for assessing whether the GHG emissions of a project in the SDAB, such as the Project, would be considered a cumulatively considerable contribution to global climate change; however, all reasonable efforts should be made to minimize a project’s contribution to global climate change.

While the Project would result in emissions of GHGs during construction and operation, no current guidance exists to indicate what level of GHG emissions would be considered substantial enough to result in a significant adverse impact on global climate. However, it is generally believed that an individual project is of insufficient magnitude by itself to directly influence climate change scientific uncertainty regarding the significance a project’s individual and cumulative effects on global climate change remains.

Thus, GHG impacts are recognized as exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective (CAPCOA 2008). This approach is consistent with that recommended by the CNRA, which noted in its Public Notice for the proposed CEQA amendments (pursuant to SB97) that the evidence before it indicates that in most cases, the impact of GHG emissions should be considered in the context of a cumulative impact, rather than a project-level impact (CNRA 2009a). Similarly, the Final Statement of Reasons for Regulatory Action on the CEQA Amendments confirm that an environmental impact report or other environmental document must analyze the incremental contribution of a project to GHG levels and determine whether those emissions are cumulatively considerable (CNRA 2009b).

Approaches to Determining Significance

Neither the State of California nor the SDAPCD has adopted quantitative emission-based thresholds of significance for GHG emissions under CEQA. In the absence of an adopted numeric

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threshold, the significance of the project's GHG emissions will be evaluated consistent with CEQA Guidelines Section 15064.4(b) by considering whether the project complies with applicable plans, policies, regulations, and requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

The plans, policies, regulations and requirements that are considered in this analysis include:

- CARB's Scoping Plan and actions taken in furtherance of its objectives to achieve identified near-term (2020), mid-term (2030) and long-term (2045/2050) targets for the reduction of GHG emissions; and,
- Those adopted in furtherance of SB 375, and specifically SANDAG's Regional Plan.

In addition, the project will be evaluated against a City-specific efficiency metric threshold based on the City's 2012 GHG inventory (City of Carlsbad 2020). An efficiency metric is calculated by dividing the allowable GHG emissions inventory in a selected calendar year by the service population (residents plus employees), which then leads to the identification of a quantity of emissions that can be permitted on a per service population basis without significantly impacting the environment. This approach focuses on the overall GHG efficiency of a project relative to regulatory GHG reduction goals.

Under the efficiency metric threshold, the Project's GHG emissions are evaluated relative to the emissions level in the Project's build-out year and the build-out year's associated efficiency metric. To that end, an efficiency metric was calculated based on the 2025 emissions level (the year of project build-out) and the project's service population (sum of number of employees and the number of residents provided by the project).

As there are no jurisdictional/City-based emissions data specific to the Project's build-out year (2025), an efficiency metric threshold was generated for year 2025 by interpolating the City-based emission targets for years 2020 and 2030. As illustrated below, the efficiency metric threshold is first calculated for 2020, so as to establish the benchmark for compliance with AB 32's 2020 reduction target (a return to 1990 levels). The 2030 emissions reduction goal was based on the SB 32 goal to reduce GHG emissions to 40 percent below 1990 levels by 2030. It should be noted that the downward trajectory from AB 32 to SB 32 is greater than that from AB 32 to EO S-3-05 of 80% below 1990 by 2050 (CARB 2017). By analyzing the project against the quantitative efficiency metric thresholds for the buildout year and for the milestone year for the next legislatively adopted target (2030), this analysis demonstrates that the project would demonstrate progress towards, and be on the trajectory towards helping the state comply with its long-term targets in EO S-3-05. . Developing community-wide mass reduction goals using this approach is consistent with CARB (2017, pp. 100–101) recommendations to determine the targets “based on

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local emissions sectors” and to “develop community-wide GHG emissions reduction goals necessary to reach 2030 and 2050 climate goals.”

To develop the 2020 efficiency metric threshold, the emissions target from AB 32 was used for year 2020 (a return to 1990 emission levels). The 2020 statewide emissions target is 4% below the 2012 statewide emissions (see Appendix A for more details). Therefore, the 2020 emissions target for the project would be 4% below the 2012 inventory of 977,000 MT CO₂e (or 933,353 MT CO₂e) (the percentage reductions have been rounded for presentation purposes, please reference Appendix A for detailed calculations). To develop the service population for that year, the SANDAG Series 13 Regional Growth Forecast was relied upon for the forecasted population and employment.

To develop the 2030 efficiency metric threshold, the emissions target from SB 32 was used for year 2030 (to reduce GHG emissions to 40 percent below 1990 levels by 2030). The 2030 statewide emissions target is 42% below the 2012 statewide emissions (see Appendix A for more details). Therefore, the 2030 emissions target for the project would be 42% below the 2012 inventory of 977,000 MT CO₂e (or 560,012 MT CO₂e). To develop the service population for that year, the SANDAG Series 13 Regional Growth Forecast was relied upon for the forecasted population and employment.

To develop the 2025 efficiency metric threshold, it is necessary to interpolate the emissions target between the 2020 and 2030 forecasted emissions. To develop the efficiency metric threshold for 2025, the City’s forecasted emissions in 2020 were reduced by 5.2% per year through 2030, which is consistent with the CARB’s Scoping Plan target for SB 32 (CARB 2015).

Table 15 shows the estimated GHG emissions target for 2025 based on the Scoping Plan’s downward trajectory to meet the SB 32 target.

Table 15
City of Carlsbad Emissions Target

	2020	2025	2030
Emissions (MT CO ₂ e)	933,353	722,972	560,012

Source: Emissions are based on the 2012 GHG emission inventory for the City of Carlsbad (Grim, pers. Comm. 2020)

Notes: The 2020 and 2030 City-wide emissions targets were based on meeting the Statewide reduction goals of AB 32 and SB 32, respectively.

The 2025 emissions target was based on the Scoping Plans downward trajectory of 5.2% per year to meet the goals of SB 32.

The efficiency metric thresholds for 2020, 2025, and 2030 are illustrated below in Table 16. If the Project achieves the 2025 efficiency metric threshold, the Project would not interfere with the State’s

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ability to achieve the GHG reduction targets per SB 32 and would demonstrate progress toward attaining 2050 targets per EO S-3-05.

Table 16
City of Carlsbad 2020, 2025, and 2030 Efficiency Metric Threshold

	Population ¹	Employment ¹	Service Population (Population + Employment)	Emissions Target (MT CO ₂ e)	Efficiency Metric Threshold (MT/SP/yr)
2020 ²	118,450	77,422	195,872	933,353	4.77
2025 ³	121,000	79,877	200,877	722,972	3.60
2030 ⁴	122,899	82,175	205,074	560,012	2.73

Sources:

¹ SANDAG 2050 Regional Growth Forecast, Series 13 (SANDAG 2013).

² Emissions for 2020 are based on the 2012 City of Carlsbad GHG Inventory and GHG reduction goals consistent with AB 32.

³ Emissions for 2025 are based on the Scoping Plan's downward trajectory to meet the SB 32 target in 2030.

⁴ Emissions for 2030 are based on the 2012 City of Carlsbad GHG Inventory and GHG reduction goals consistent with SB 32.

Notes: CO₂e = carbon dioxide equivalent; MT = metric ton; SP = service population; yr = year.

As shown in Table 16, the calculated efficiency metric threshold for 2025 based on the City's 2012 GHG emissions and the statewide emissions reduction trajectory is 3.60 MT/SP/yr. Again, this 2025 efficiency metric threshold reflects the trajectory planned for in the State's Scoping Plan. If the Project achieves the 2025 efficiency metric threshold, it would not interfere with attainment of the 2030 and 2050 statewide emission reduction targets, and therefore not interfere with the State's and the City's ability to achieve the mid-term and long-term GHG reduction targets.

Service Population

Based on a residential density of 2.59 persons per household found within the SANDAG Series 13 Growth Forecast for the City, the Project would have a residential population of 772 (2.59 persons per household X 298 units) (SANDAG 2013). The Project applicant estimates that 25 people will be employed in the restaurant and retail land uses. Therefore, the Project would have a total service population of 797 persons.

3.4.2 Approach and Methodology

As discussed in Section 3.1.3, this analysis assumes that the GWP for CH₄ is 25 and the GWP for N₂O is 298, based on the IPCC Fourth Assessment Report (IPCC 2007).

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3.4.2.1 Construction

CalEEMod Version 2016.3.2 was used to estimate potential Project-generated GHG emissions during construction. Construction of the Project would result in GHG emissions primarily associated with use of off-road construction equipment, on-road hauling and vendor (material delivery) trucks, and worker vehicles. All details for construction criteria air pollutants discussed in Section 2.4.2.1, are also applicable for the estimation of construction-related GHG emissions. As such, see Section 2.4.2.1 for a discussion of construction emissions calculation methodology and assumptions.

Carbon Sequestration (Loss)

This GHG analysis estimates the loss of sequestered carbon associated with the proposed land use change under the construction impact analysis. The gain of sequestered carbon associated with planting new trees is evaluated under the operational impact analysis discussed later in this section.

The calculation methodology and default values provided in the CalEEMod Version 2016.3.2, User's Guide (CAPCOA 2017) was used to calculate potential CO₂ emissions associated with the one-time change in carbon sequestration capacity of a vegetation land use type. The calculation of the one-time loss of sequestered carbon is the product of the converted acreage value and the carbon content value for each land use type (vegetation community). The mass of sequestered carbon per unit area (expressed in units of MT of CO₂ per acre) is dependent on the specific land use type. Assuming that the sequestered carbon is released as CO₂ after removal of the vegetation, annual CO₂ is calculated by multiplying total biomass (MT of dry matter per acre) from IPCC data by the carbon fraction in plant material, and then converts MT of carbon to MT of CO₂ based on the molecular weights of carbon and CO₂ (IPCC 2014).

It is assumed that all sequestered carbon from the removed oak trees will be returned to the atmosphere; that is, the wood from the trees and vegetation communities would not be re-used in a solid form or another form that would retain carbon. GHG emissions generated during construction activities, including clearing, tree removal, and grading, were included in the construction GHG emissions calculations.

3.4.2.2 Operation

CalEEMod Version 2016.3.2 was used to estimate potential Project-generated operational GHG emissions from area sources (landscape maintenance), energy sources (natural gas and electricity), mobile sources, solid waste, and water supply and wastewater treatment. Emissions from each category are discussed in the following text with respect to the Project. For additional details, see Section 2.4.2.2, Operation, for a discussion of operational emission calculation methodology and

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assumptions, specifically for area, energy (natural gas), and mobile sources. Operational year 2025 was assumed as it is the first full year of operation following completion of construction.

Energy Sources

As represented in CalEEMod, energy sources include GHG emissions associated with building electricity and natural gas usage (non-hearth).

CalEEMod default values for energy consumption for each land use were applied for the Project analysis. The energy use from residential land uses is calculated in CalEEMod based on the California Residential End-Use Survey database. The program uses data collected during the Residential Appliance Saturation Survey to develop energy intensity values (electricity and natural gas usage per square foot per year) for residential buildings. To account for the use of electric water heaters, the default energy use in CalEEMod was revised based on the typical annual fuel utilization efficiencies of electric and natural gas water heaters and the portion of water heater natural gas use within a building (US Department of Energy 2020). Energy use in buildings (both natural gas and electricity) is divided by the program into end use categories subject to Title 24 requirements (end uses associated with the building envelope, such as the HVAC system, water heating system, and integrated lighting) and those not subject to Title 24 requirements (such as appliances, electronics, and miscellaneous “plug-in” uses).

Title 24 of the California Code of Regulations serves to enhance and regulate California’s building standards. The most recent amendments to Title 24, Part 6, referred to as the 2016 standards, became effective on January 1, 2017. The 2019 Title 24 standards will take effect on January 1, 2020. Therefore, the proposed project would be subject to the 2019 Title 24 standards. However, CalEEMod’s default values for energy consumption are based on compliance with the 2016 Title 24 standards. No adjustments were made in accordance with the 2019 Title 24 code and thus the energy use provided herein is considered conservative.

In general, single-family residences built to the 2019 standards are anticipated to use approximately 7 percent less energy due to energy efficiency measures than those built to the 2016 standards; once rooftop solar electricity generation is factored in, single-family residences built under the 2019 standards will use approximately 53 percent less energy than those under the 2016 standards (CEC 2018b). Nonresidential buildings built to the 2019 standards are anticipated to use an estimated 30 percent less energy than those built to the 2016 standards (CEC 2018b).

Annual natural gas (non-hearth) and electricity emissions were estimated in CalEEMod using the emissions factors for San Diego Gas and Electric (SDG&E), which would be the energy source provider for the Project. For operational year 2025, the emission factors for SDG&E were

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adjusted to reflect SDG&E's compliance with the RPS standards, which is based on the renewable procurement percentage of 44% from the 2017 SDG&E RPS submittal (CEC 2018).

The Project will incorporate solar photovoltaic panels on site for both the residential and commercial components. The residential units will include a solar photovoltaic system in accordance with 2019 Title 24 requirements (which requires residential developments to offset their entire electricity demand through solar photovoltaic), totaling 554 kW. The commercial component of the Project will include at a minimum a 15 kW solar photovoltaic system in accordance with City Ordinance CS-347. The Project will also include Energy Star appliances and at least 75% light emitting diode lighting fixtures for interior and exterior. The Project will include electric water heaters in accordance with City Ordinance CS-347 and CS-348. All residential unit garages will be equipped to be electric vehicle (EV) Ready⁷ and the commercial component will include at least four EV Capable⁸ parking spaces and would also include two EV charging stations for public use in accordance with City Ordinance CS-349. The EV Ready, EV Capable, and EV charging stations were not account for in the modeling.

Solid Waste

The Project would generate solid waste and would, therefore, result in CO₂e emissions associated with landfill off-gassing. Solid waste generation was derived from the CalEEMod default rates for each land use type. Emission estimates associated with solid waste were estimated using CalEEMod. A solid waste diversion rate of 50% was assumed in accordance with AB 341.

Water Supply and Wastewater

Water supplied to the Project requires the use of electricity. Accordingly, the supply, conveyance, treatment, and distribution of water would indirectly result in GHG emissions through use of electricity. Annual water use for the Project and GHG emissions associated with the electricity used for water supply were calculated based upon default water use estimates for each land-use type, as estimated by CalEEMod and San Diego Gas and Electric factors. The Project would include low-flow fixtures in all buildings and use non-potable water for irrigation of the landscaping. Additional reclaimed water will be available for the Project to use, but as a

⁷ EV Ready means a parking space that is pre-wired with a dedicated 208/240 branch circuit installed in conduit that originates at the electrical service panel or sub-panel and 40 ampere minimum overcurrent protection device, and terminates into a cabinet, box or enclosure, in a manner approved by the building official (City of Carlsbad 2017a).

⁸ EV Capable means a parking space that has a cabinet, box or enclosure connected to a conduit linking the parking space to the electrical service panel in a manner approved by the building official. The electrical service panel shall provide sufficient capacity to simultaneously charge all electric vehicles with or without a load management system (City of Carlsbad 2017a).

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conservative measure, it was only assumed to be used for the parks and greenbelts. These features were accounted for in the modeling.

3.5 Impact Analysis

Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Construction Emissions

Construction of the Project would result in GHG emissions, which are primarily associated with use of off-road construction equipment, on-road hauling and vendor (material delivery) trucks, and worker vehicles. GHG emissions associated with temporary construction activity were quantified using CalEEMod. A detailed depiction of the construction schedule—including information regarding phasing, equipment utilized during each phase, haul trucks, vendor trucks, and worker vehicles—is included in Section 2.4.2.1 of this report.

Table 17 shows the estimated annual GHG construction emissions associated with the Project, as well as the amortized construction emissions over a 30-year “project life.”

Table 17
Estimated Annual Construction GHG Emissions

Year	CO ₂	CH ₄	N ₂ O	CO ₂ e
	Metric Tons per Year			
2021	910.15	0.20	0.00	915.20
2022	75.51	0.01	0.00	75.68
2023	74.24	0.01	0.00	74.41
2024	7.64	0.00	0.00	7.68
Total				1,072.97
Amortized Emissions				35.77

Notes: CO₂ = carbon dioxide; CH₄ = methane; N₂O = nitrous oxide; CO₂e = carbon dioxide equivalent.
See Appendix A for complete results.

Total construction emissions for the Project were 1,073 MT CO₂e. Estimated amortized Project-generated construction emissions would be approximately 36 MT CO₂e. However, because there is no separate GHG threshold for construction emissions alone, the evaluation of significance is discussed in the operational emissions analysis below.

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The loss of sequestered carbon from the removal of 2.1 acres of ornamental/non-native vegetation is estimated based on the carbon content estimate of the vegetation over the growth period (MT CO₂ per tree) (HELIX Environmental Planning, Inc. 2018). The loss of sequestered carbon is presented in Table 18.

Table 18
Planted Trees Sequestered Carbon

Tree Species	Growing Period (years)	Sequestration Rate (MT CO ₂ /acre/year)	Quantity of Vegetation Removed (acres)	Sequestered Carbon (MT CO ₂)
Grassland	20	4.31	2.1	181.02

Source: CAPCOA 2017.

Notes: MT CO₂ = metric tons carbon dioxide.

See Appendix A for calculations and sources.

As presented in Table 18, the removal of 2.1 acres of ornamental/non-native vegetation would result in the release of approximately 181 MT CO₂. Including the construction emissions in Table 17, the total estimated GHG emissions from the construction of the Project would be 1,254 MT CO₂e. The construction and loss of sequestered carbon emissions amortized over 30 years would be 41.80 MT CO₂e per year.

Operational Emissions

Operation of the Project would generate GHG emissions through motor vehicle trips to and from the Project site; landscape maintenance equipment operation; energy use (natural gas and generation of electricity consumed by the Project); solid waste disposal; and generation of electricity associated with water supply, treatment, and distribution and wastewater treatment. CalEEMod was used to calculate the annual GHG emissions based on the operational assumptions described in Section 3.4.2.2, Operation.

The estimated operational (year 2025) Project-generated GHG emissions from area sources, energy usage, motor vehicles, solid waste generation, and water usage and wastewater generation are shown in Table 19.

Table 19
Estimated Annual Operational GHG Emissions

Emission Source	CO ₂	CH ₄	N ₂ O	CO ₂ e
	Metric Tons per Year			
Area	3.62	0.00	0.00	3.70
Energy	201.85	0.01	0.00	202.91

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Table 19
Estimated Annual Operational GHG Emissions

Emission Source	CO ₂	CH ₄	N ₂ O	CO ₂ e
	<i>Metric Tons per Year</i>			
Mobile	1,603.17	0.08	0.00	1,605.21
Solid waste	21.05	1.24	0.00	52.14
Water supply and wastewater	49.99	0.55	0.01	67.75
Total				1,931.72
<i>Amortized Construction Emissions</i>				<i>41.80</i>
Operation + Amortized Construction Total				1,973.52

Notes: CO₂ = carbon dioxide; CH₄ = methane; N₂O = nitrous oxide; CO₂e = carbon dioxide equivalent.

See Appendix A for detailed results.

These emissions reflect California Emissions Estimator Model "mitigated" output and operational year 2025 including high efficiency lighting, solar photovoltaics, increased diversity, increased transit accessibility, and below market-rate housing.

As shown in Table 19, estimated annual Project-generated GHG emissions in 2025 would be approximately 1,932 MT CO₂e per year as a result of Project operations. Estimated annual Project-generated emissions in 2025 from area, energy, mobile, solid waste, and water/wastewater sources and amortized Project construction emissions would be approximately 1,974 MT CO₂e per year.

The gain of sequestered carbon resulting from planting and growth of approximately 1,382 trees of various species on site is estimated based on the carbon sequestration rate for the tree species, the number of new trees, and the growing period. It is assumed that all trees will grow for a minimum of 20 years. Table 20 presents the estimated one-time carbon-stock change resulting from proposed planting of new trees.

Table 20
Planted Trees Sequestered Carbon

Tree Species	Growing Period (years)	Sequestration Rate (MT CO ₂ /tree/year)	Quantity of New Tree Plantings (trees)	Sequestered Carbon (MT CO ₂)
Miscellaneous	20	0.0354	1,382	978.46

Source: CAPCOA 2017.

Notes: MT CO₂ = metric tons carbon dioxide.

See Appendix A for calculations and sources.

As presented in Table 20, the gain in sequestered carbon resulting from planting 1,382 trees would be approximately 979 MT CO₂, or 48.92 MT CO₂ per year. Including the sequestered carbon from planted trees, the estimated annual Project-generated GHG emissions would be approximately 1,925 MT CO₂e per year as a result of Project operation.

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Impact Analysis

As discussed in Section 3.4.1, the Project's impact will be assessed based on its consistency with applicable GHG reduction plans, rules, and laws set forth locally, regionally, and statewide. The project's sustainable attributes will be evaluated against these criteria, and, as such, are provided in detail below:

- The Project would add important housing stock to an infill location close to existing employment and commercial centers.
 - As background, SANDAG's Series 13 Regional Growth Forecast projected that the City of Carlsbad would have 48,448 housing units and 77,422 jobs in 2020, for a jobs/housing ratio of 1.60 (SANDAG 2013). As such, the City needs additional housing units (including affordable units) to balance its employment-generating land uses. By providing increased residential opportunities within the City, this Project would help the City to reduce the trip lengths traveled by employees to their work destinations in Carlsbad. This was not included in the modeling.
- The Project would reduce the consumption of natural gas and promote building electrification through a number of design features. These items were included in the modeling and discussed more in detail in Sections 2.4.2.2 and 3.4.2.2.
 - The Project would not include fireplaces or woodstoves.
 - The Project would use electric-based water heating.
 - The Project would be designed to include a solar PV rooftop system for the residences that would be rated at 554-kW direct current. This system is estimated to generate up to 902,487 kWh per year (NREL 2017). The commercial area would have a 15-kW solar PV system that is estimated to generate up to 24,591 kWh per year.
- The Project would incorporate additional efficiencies in the built environment relating to the consumption of transportation fuels, energy, and water.
 - All residential unit garages will be equipped to be electric vehicle (EV) Ready and the commercial component will include at least four EV Capable parking space and would also include two EV charging stations for public use. This was not accounted for in the modeling.
 - The Project would include Energy Star appliances. This was accounted for in the modeling and discussed in Section 3.4.2.2.

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- The Project would include use of LED lighting or other efficient lighting for at least 75% of the total luminaires. This was accounted for in the modeling and discussed in Section 3.4.2.2.
- The Project would include low-flow or high-efficiency water fixtures (toilet, showerhead, clothes washer, etc.). This was accounted for in the modeling and discussed in Section 3.4.2.2.

As shown previously, the total operational emissions for the Project would be approximately 1,925 MT CO₂e per year, including amortized construction emissions. As presented in Section 3.4.1, the efficiency metric threshold for the Project's buildout year was 3.60 MT CO₂e/person/year. The Project would have an efficiency metric of 2.42 MT CO₂e/person/year (1,925 MT CO₂e per year / 797 persons). Therefore, the Project would not exceed the efficiency metric threshold for 2025 and thus would be consistent with the state's targets within SB 32 for 2030. Furthermore, the Project would also have a lower efficiency metric than the threshold for 2030 (2.73 MT CO₂e/person/year), five years beyond the Project's anticipated buildout year.

Consistency with CARB's Scoping Plan

The Scoping Plan, approved by CARB on December 12, 2008, provides a framework for actions to reduce California's GHG emissions and requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. As such, the Scoping Plan is not directly applicable to specific projects. Relatedly, in the Final Statement of Reasons for the Amendments to the CEQA Guidelines, the CNRA observed that "[t]he [Scoping Plan] may not be appropriate for use in determining the significance of individual projects because it is conceptual at this stage and relies on the future development of regulations to implement the strategies identified in the Scoping Plan" (CNRA 2009a). Under the Scoping Plan, however, there are several state regulatory measures aimed at the identification and reduction of GHG emissions. CARB and other state agencies have adopted many of the measures identified in the Scoping Plan. Most of these measures focus on area source emissions (e.g., energy usage, high-GWP GHGs in consumer products) and changes to the vehicle fleet (i.e., hybrid, electric, and more fuel-efficient vehicles) and associated fuels (e.g., low-carbon fuel standard), among others. The Project would comply with all applicable regulations adopted in furtherance of the Scoping Plan to the extent required by law.

The Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of AB 32 and establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. Table 21 highlights measures that have been developed under the Scoping Plan and the Project's consistency with Scoping Plan measures. The table also identifies applicable measures included in the 2017 Scoping Plan Update. The Plan is a package

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of economically viable and technologically feasible actions to not just keep California on track to achieve its 2030 target, but stay on track for a low- to zero-carbon economy by involving every part of the state (CARB 2017). To the extent that these regulations are applicable to the Project, its inhabitants, or uses, the Project would comply with all applicable regulations adopted in furtherance of the Scoping Plan.

Table 21
Project Consistency with Scoping Plan GHG Emission-Reduction Strategies

Scoping Plan Measure	Measure Number	Project Consistency
<i>Transportation Sector</i>		
1.5 million zero-emission and plug-in hybrid light-duty electric vehicles by 2025 (4.2 million Zero-Emissions Vehicles by 2030)	N/A	All residential unit garages will be equipped to be electric vehicle (EV) Ready and the commercial component will include at least four EV Capable parking space and would also include two EV charging stations for public use.
Regional Transportation-Related GHG Targets	T-3	CARB has adopted its regional transportation-related GHG targets in furtherance of SB 375. Those targets do not apply directly to the Project, and instead are considered by MPOs (like SANDAG) when developing their Sustainable Communities Strategies. See below for discussion of the Project's consistency with SANDAG's RTP/SCS.
Reduction in Vehicle Miles Traveled	N/A	The Project is located on an infill site that is in close proximity to multi-modal transportation options. Further, the Project would provide needed residential opportunities (including affordable housing units) in the City of Carlsbad, helping to improve the jobs/housing ratio and reduce the trip lengths traveled by persons employed in the City.
<i>Electricity and Natural Gas Sector</i>		
Energy Efficiency Measures (Electricity)	E-1	The Project would comply with the Title 24, Part 6, building energy efficiency standards applicable at the time of building permit application. Further, as described above, the Project includes numerous design attributes that would reduce natural gas consumption, promote building electrification, and achieve other efficiencies relative to the consumption of energy.
Energy Efficiency (Natural Gas)	CR-1	The Project would comply with the Title 24, Part 6, building energy efficiency standards applicable at the time of building permit application. As discussed above, the Project also includes other design attributes to reduce natural gas consumption, including the use of electric water heaters and the elimination of natural gas fireplaces from the design of the residential units.
Renewable Portfolios Standard	E-3	The Project would use energy supplied by San Diego Gas and Electric, which is in compliance with the Renewable Portfolio Standard. SDG&E reported a 44% renewables mix in calendar year 2017.

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Table 21
Project Consistency with Scoping Plan GHG Emission-Reduction Strategies

Scoping Plan Measure	Measure Number	Project Consistency
Senate Bill 1 Million Solar Roofs (California Solar Initiative, New Solar Home Partnership, Public Utility Programs) and Earlier Solar Programs	E-4	The Project would be designed to include a solar PV rooftop system for the residences that would be rated at 554 kW direct current. This system is estimated to generate up to 902,487 kWh per year. The commercial area would have a 15 kW solar PV system that is estimated to generate up to 24,591 kWh per year.
<i>Water Sector</i>		
Water Use Efficiency	W-1	The Project would utilize water saving features, including low-flow fixtures and water-efficient landscape irrigation.
Water Recycling	W-2	The Project would include waste piping to permit the discharge of greywater to be used for outdoor irrigation.
Reuse Urban Runoff	W-4	The Project would include low impact development measures to the extent feasible to reduce the amount of stormwater runoff from the site.
<i>Green Buildings</i>		
State Green Building Initiative: Leading the Way with State Buildings (Greening New and Existing State Buildings)	GB-1	The Project would be required to be constructed in compliance with state and local green building standards in effect at the time of building construction.
Green Building Standards Code (Greening New Public Schools, Residential and Commercial Buildings)	GB-2	The Project's buildings would meet green building standards that are in effect at the time of building permit application.
Beyond Code: Voluntary Programs at the Local Level (Greening New Public Schools, Residential and Commercial Buildings)	GB-3	The Project would be required to be constructed in compliance with local green building standards in effect at the time of building permit application.
<i>Recycling and Waste Management Sector</i>		
Mandatory Commercial Recycling	RW-3	This measure applies to commercial projects. However, during both construction and operation of the Project, the Project would comply with all state regulations related to solid waste generation, storage, and disposal, including the California Integrated Waste Management Act, as amended. During construction, all wastes would be recycled to the maximum extent possible.
<i>High Global Warming Potential Gases Sector</i>		
Limit High Global Warming Potential Use in Consumer Products	H-4	The Project's residents would use consumer products that would comply with the regulations that are in effect at the time of manufacture.

Source: CARB 2008, CARB 2017b.

Notes: CARB = California Air Resources Board; GHG = greenhouse gas; Project = Marja Acres Community Plan.

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Based on the analysis in Table 21, the Project would be consistent with the applicable strategies and measures in the Scoping Plan.

In addition to the measures outlined in the table above, the Scoping Plan also highlights, in several areas, the goals and importance of infill projects. Specifically, the Scoping Plan calls out an ongoing and proposed measure to streamline CEQA compliance and other barriers to infill development. The plan encourages infill projects and sees them as crucial to achieving the State's long-term climate goals. The plan encourages accelerating equitable and affordable infill development through enhanced financing and policy incentives and mechanisms.

The State completed an Integrated Natural and Working Lands Climate Change Action Plan in 2018, which considered aggregation of eco-regional plans and efforts to achieve net sequestration goals. The Action Plan includes goals and plans to promote and provide incentives for infill development through community revitalization and urban greening and promote the adoption of regional transportation and development plans, such as SB 375 Sustainable Communities Strategies and Climate Action Plans, that prioritize infill and compact development and also consider the climate change impacts of land use and management.

The following strategies were outlined to expand infill development within the 2017 Scoping Plan:

- Encouraging regional Transfer of Development Rights programs to allow owners of natural and working lands to sell their development rights to developers who can use those rights to add additional density to development projects in preferred infill areas.
- Promoting regional Transit-Oriented Development funds that leverage public resources with private-sector investment capital to provide flexible capital for Transit-Oriented Development projects.
- Rebates for low-VMT/location-efficient housing, similar to programs that use rebates to encourage adoption of energy-efficient appliances, ZEVs, water-efficient yards, or renewable energy installation. For example, the rebate could reimburse residents for a portion of the down payment for purchasing or renting a qualified home in exchange for a minimum term of residence.
- Promotion of cross-subsidizing multi-station financing districts along transit corridors to leverage revenues from development in strong-market station areas in order to seed needed infrastructure and development in weaker-market station areas.
- Abatement of residential property tax increases in exchange for property-based improvements in distressed infill areas.
- Ways to promote reduced parking in areas where viable transportation alternatives are present.

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- Additional creative financing mechanisms to enhance the viability of priority infill projects.
- Ways to promote and strengthen Urban Growth Boundaries to promote infill development and conservation of natural and working lands by defining and limiting developable land within a metropolitan area according to projected growth needs.

In summary, the Project would be consistent with the measures and policy goals as shown in Table 21. The Project would also be consistent with the various efforts the Scoping Plan established to encourage infill development projects. Therefore, the Project would be consistent with CARB's 2017 Scoping Plan.

In addition to the statewide measures presented in Table 21, the 2017 Scoping Plan presented a suite of local actions that agencies can take to reduce GHG emissions, as found within Appendix B of the 2017 Scoping Plan (CARB 2017). The Project's consistency with the Scoping Plan local actions is presented in Table 22.

Table 22 Project Consistency with Scoping Plan Local Actions

Scoping Plan Local Action	Project Consistency
<i>Construction</i>	
Enforce idling time restrictions for construction vehicles	The Project will enforce unnecessary idling to 5 minutes, in accordance with CARB's Off-Road Regulation.
Divert and recycle construction and demolition waste, and use locally-sourced building materials with a high recycled material content to the greatest extent feasible	The Project will divert and recycle construction and demolition waste in accordance with all applicable rules and regulations.
Minimize tree removal, and mitigate indirect GHG emissions increases that occur due to vegetation removal, loss of sequestration, and soil disturbance	The Project would not remove any trees during construction on the site.
<i>Operation</i>	
Comply with lead agency's standards for mitigating transportation impacts under SB 743	The Project's VMT is consistent with the City's VMT goal developed in accordance with SB 743. The project's VMT consistency with SB 743 is discussed in further detail below.
Require on-site EV charging capabilities for parking spaces serving the project to meet jurisdiction-wide EV proliferation goals	All residential unit garages will be equipped to be EV Ready and the commercial component will include at least four EV Capable parking space and would also include two EV charging stations for public use.
Provide adequate, safe, convenient, and secure on-site bicycle parking and storage in multi-family residential projects and in non-residential projects	The Project will include on-site bicycle parking and storage for the commercial development.
Require on-site renewable energy generation	The Project will also include 554 kW of solar PV on the residential rooftops and 15 kW of solar PV as part of the commercial development.
Prohibit wood-burning fireplaces in new development, and require replacement of wood-burning fireplaces for renovations over a certain size developments	The Project will not have fireplaces or wood-burning stoves.

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Table 22 Project Consistency with Scoping Plan Local Actions

Scoping Plan Local Action	Project Consistency
Require solar-ready roofs	The Project will also include 554 kW of solar PV on the residential rooftops and 15 kW of solar PV as part of the commercial development.
Require low-water landscaping in new developments	The Project will include water-efficient landscaping techniques including drip where practical.
Expand urban forestry and green infrastructure in new land development	The Project proposes to plant 1,382 trees as part of the landscaping design in addition to other smaller vegetation and shrubs.
Require the design of the electric outlets and/or wiring in new residential unit garages to promote electric vehicle usage	All residential unit garages will be equipped to be EV Ready and the commercial component will include at least four EV Capable parking space and would also include two EV charging stations for public use.
Require each residential unit to be “solar ready,” including installing the appropriate hardware and proper structural engineering	The Project will also include 554 kW of solar PV on the residential rooftops and 15 kW of solar PV as part of the commercial development.
Require the installation of energy conserving appliances such as on-demand tank-less water heaters and whole-house fans	The Project will include the use of energy conserving appliances, such as ENERGYSTAR labeled.
Require each residential and commercial building equip buildings with energy efficient AC units and heating systems with programmable thermostats/timers	The Project will equip each residential unit with programmable thermostats to control the heating and AC system.
Require each residential and commercial building to utilize low flow water fixtures such as low flow toilets and faucets	The Project would include low-flow or high-efficiency water fixtures (toilet, showerhead, clothes washer, etc.).
Require the use of energy-efficient lighting for all street, parking, and area lighting	The Project will also include use of LED lighting or other efficient lighting for at least 75 percent of the total luminaires.
Require the landscaping design for parking lots to utilize tree cover and compost/mulch	Of the 1,382 total trees that will be planted with development of the Project, 504 of those trees would provide shade over the parking lot. The Project would also utilize compost or mulch within these planter boxes.

Source: CARB 2017.

Notes: GHG = greenhouse gas; Project = The Marja Acres Community Plan; CARB = California Air Resources Board; EV = electric vehicle; SF₆ = sulfur hexafluoride.

As shown in Table 22, the Project would be consistent with all applicable Local Actions within Appendix B of the Scoping Plan.

Consistency with Applicable GHG-Related Laws and Regulations

The project’s consistency with statewide GHG reduction strategies is summarized in detail in Table 23.

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Table 23
Applicable Greenhouse Gas-Related Laws and Regulations

Project Component	Applicable Laws/Regulations	GHG Reduction Measures Required for Project
<i>Building Components/Facility Operations</i>		
Roofs/Ceilings/Insulation	CALGreen Code (Title 24, Part 11) California Energy Code (Title 24, Part 6)	The project must comply with efficiency standards regarding roofing, ceilings, and insulation. For example: <u>Roofs/Ceilings</u> : New construction must reduce roof heat island effects per CALGreen Code Section 106.11.2, which requires use of roofing materials having a minimum aged solar reflectance, thermal emittance complying with Section A5.106.11.2.2 and A5.106.11.2.3 or a minimum aged Solar Reflectance Index as specified in Tables A5.106.11.2.2, or A5.106.11.2.3. Roofing materials must also meet solar reflectance and thermal emittance standards contained in Title 20 Standards. <u>Roof/Ceiling Insulation</u> : There are also requirements for the installation of roofing and ceiling insulation. (See Title 24, Part 6 Compliance Manual at Section 3.2.2.)
Flooring	CALGreen Code	The project must comply with efficiency standards regarding flooring materials. For example, for 80% of floor area receiving “resilient flooring,” the flooring must meet applicable installation and material requirements contained in CALGreen Code Section 5.504.4.6.
Window and Doors (Fenestration)	California Energy Code	The project must comply with fenestration efficiency requirements. For example, the choice of windows, glazed doors, and any skylights for the project must conform to energy consumption requirements affecting size, orientation, and types of fenestration products used. (See Title 24, Part 6 Compliance Manual, Section 3.3.)
Building Walls/Insulation	CALGreen Code California Energy Code	The project must comply with efficiency requirements for building walls and insulation. <u>Exterior Walls</u> : Must meet requirements in current edition of California Energy Code, and comply with Sections A5.106.7.1 or A5.106.7.2 of CALGreen Code for wall surfaces, as well as Section 5.407.1, which required weather-resistant exterior wall and foundation envelope as required by California Building Code Section 1403.2. Construction must also meet requirements contained in Title 24, Part 6, which vary by material of the exterior walls. (See Title 24, Part 6 Compliance Manual, Part 3.2.3.) <u>Demising (Interior) Walls</u> : Mandatory insulation requirements for demising walls (which separate conditioned from non-conditions space) differ by the type of wall material used. (<i>Id.</i> at 3.2.4.) <u>Door Insulation</u> : There are mandatory requirements for air infiltration rates to improve insulation efficiency; they differ according to the type of door. (<i>Id.</i> at 3.2.5.) <u>Flooring Insulation</u> : There are mandatory requirements for insulation that depend on the material and location of the flooring. (<i>Id.</i> at 3.2.6.)

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Table 23
Applicable Greenhouse Gas-Related Laws and Regulations

Project Component	Applicable Laws/Regulations	GHG Reduction Measures Required for Project
Finish Materials	CALGreen Code	The project must comply with pollutant control requirements for finish materials. For example, materials including adhesives, sealants, caulks, paints and coatings, carpet systems, and composite wood products must meet requirements in CALGreen Code to ensure pollutant control. (CALGreen Code Section 5.504.4.)
Wet Appliances (Toilets/Faucets/Urinals, Dishwasher/Clothes Washer, Spa and Pool/Water Heater)	CALGreen Code California Energy Code Appliance Efficiency Regulations (Title 20 Standards)	<p>Wet appliances associated with the project must meet various efficiency requirements. For example:</p> <p><u>Spa and Pool:</u> Use associated with the project is subject to appliance efficiency requirements for service water heating systems and equipment, spa and pool heating systems and equipment. (Title 24, Part 6, Sections 110.3, 110.4, 110.5; Title 20 Standards, Sections 1605.1(g), 1605.3(g); see also California Energy Code.)</p> <p><u>Toilets/Faucets/Urinals:</u> Use associated with the project is subject to new maximum rates for toilets, urinals, and faucets effective January 1, 2016:</p> <ul style="list-style-type: none"> • Showerheads maximum flow rate 2.5 gpm at 80 psi • Wash fountains 2.2 x (rim space in inches/20) gpm at 60 psi • Metering faucets 0.25 gallons/cycle • Lavatory faucets and aerators 1.2 gpm at 60 psi • Kitchen faucets and aerators 1.8 gpm with optional temporary flow of 2.2 gpm at 60 psi • Public lavatory faucets 0.5 gpm at 60 psi • Trough-type urinals 16 inches length • Wall mounted urinals 0.125 gallons per flush • Other urinals 0.5 gallons per flush <p>(Title 20 Standards, Sections 1605.1(h),(i) 1605.3(h),(i).)</p> <p><u>Water Heaters:</u> Use associated with the project is subject to appliance efficiency requirements for water heaters. (Title 20 Standards, Sections 1605.1(f), 1605.3(f).)</p> <p><u>Dishwasher/Clothes Washer:</u> Use associated with the project is subject to appliance efficiency requirements for dishwashers and clothes washers. (Title 20 Standards, Sections 1605.1(o),(p),(q), 1605.3(o),(p),(q).)</p>
Dry Appliances (Refrigerator/Freezer, Heater/Air Conditioner, Clothes Dryer)	Title 20 Standards CALGreen Code	<p>Dry appliances associated with the project must meet various efficiency requirements. For example:</p> <p><u>Refrigerator/Freezer:</u> Use associated with the project is subject to appliance efficiency requirements for refrigerators and freezers. (Title 20 Standards, Sections 1605.1(a), 1605.3(a).)</p> <p><u>Heater/Air Conditioner:</u> Use associated with the project is subject to appliance efficiency requirements for heaters and air conditioners. (Title 20 Standards, Sections 1605.1(b),(c),(d),(e), 1605.3(b),(c),(d),(e) as applicable.)</p>

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Table 23
Applicable Greenhouse Gas-Related Laws and Regulations

Project Component	Applicable Laws/Regulations	GHG Reduction Measures Required for Project
Lighting		Clothes Dryer: Use associated with the project is subject to appliance efficiency requirements for clothes dryers. (Title 20 Standards, Section 1605.1(q).)
	CALGreen Code	Installations of HVAC, refrigeration and fire suppression equipment must comply with CALGreen Code Sections 5.508.1.1 and 508.1.2, which prohibits CFCs, halons, and certain HCFCs and HFCs.
	Title 20 Standards	Lighting associated with the project will be subject to energy efficiency requirements contained in Title 20 Standards. <u>General Lighting</u> : Indoor and outdoor lighting associated with the project must comply with applicable appliance efficiency regulations (Title 20 Standards, Sections 1605.1(j),(k),(n), 1605.3(j),(k),(n).) <u>Emergency lighting and self-contained lighting</u> : the project must also comply with applicable appliance efficiency regulations (Title 20 Standards, Sections 1605.1(l), 1605.3(l).) <u>Traffic Signal Lighting</u> : For any necessary project improvements involving traffic lighting, traffic signal modules and traffic signal lamps will need to comply with applicable appliance efficiency regulations (Title 20 Standards, Sections 1605.1(m), 1605.3(m).)
Bicycle and Vehicle Parking	California Energy Code	Lighting associated with the project will also be subject to energy efficiency requirements contained in Title 24, Part 6, which contains energy standards for non-residential indoor lighting and outdoor lighting. (See Title 24 Part 6 Compliance Manual, at Sections 5, 6.) Mandatory lighting controls for indoor lighting include, for example, regulations for automatic shut-off, automatic daytime controls, demand responsive controls, and certificates of installation. (Id. at Section 5.) Regulations for outdoor lighting include, for example, creation of lighting zones, lighting power requirements, a hardscape lighting power allowance, requirements for outdoor incandescent and luminaire lighting, and lighting control functionality. (Id. at Section 6.)
	AB 1109	Lighting associated with the project will be subject to energy efficiency requirements adopted pursuant to AB 1109. Enacted in 2007, AB 1109 required the CEC to adopt minimum energy efficiency standards for general purpose lighting, to reduce electricity consumption 50% for indoor residential lighting and 25% for indoor commercial lighting.
Bicycle and Vehicle Parking	CALGreen Code	The project will be required to provide compliant bicycle parking, fuel-efficient vehicle parking, and electric vehicle charging spaces (CALGreen Code Sections 5.106.4, 5.106.5.1, 5.106.5.3)
	California Energy Code	The project is also subject to parking requirements contained in Title 24, Part 6. For example, parking capacity is to meet but not exceed minimum local zoning requirements, and the project

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Table 23
Applicable Greenhouse Gas-Related Laws and Regulations

Project Component	Applicable Laws/Regulations	GHG Reduction Measures Required for Project
		should employ approved strategies to reduce parking capacity (Title 24, Part 6, section 106.6)
Landscaping	CALGreen Code	The CALGreen Code requires and has further voluntary provisions for: - A water budget for landscape irrigation use; - For new water service, separate meters or submeters must be installed for indoor and outdoor potable water use for landscaped areas of 1,000-5,000 square feet; - Provide water-efficient landscape design that reduces use of potable water beyond initial requirements for plant installation and establishment
	Model Water Efficient Landscaping Ordinance	The model ordinance promotes efficient landscaping in new developments and establishes an outdoor water budget for new and renovated landscaped areas that are 500 square feet or larger. (CCR, Title 23, Division 2, Chapter 2.7.)
	Cap-and-Trade Program	Transportation fuels used in landscape maintenance equipment (e.g., gasoline) would be subject to the Cap-and-Trade Program. (See "Energy Use," below.)
Refrigerants	CARB Management of High GWP Refrigerants for Stationary Sources	Any refrigerants associated with the project will be subject to CARB standards. CARB's Regulation for the Management of High GWP Refrigerants for Stationary Sources 1) reduces emissions of high-GWP refrigerants from leaky stationary, non-residential refrigeration equipment; 2) reduces emissions resulting from the installation and servicing of stationary refrigeration and air conditioning appliances using high-GWP refrigerants; and 3) requires verification GHG emission reductions. (CCR, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 5.1, Section 95380 et seq.)
Consumer Products	CARB High GWP GHGs in Consumer Products	All consumer products associated with the project will be subject to CARB standards. CARB's consumer products regulations set VOC limits for numerous categories of consumer products, and limits the reactivity of the ingredients used in numerous categories of aerosol coating products (CCR, Title 17, Division 3, Chapter 1, Subchapter 8.5.)
<i>Construction</i>		
Use of Off-Road Diesel Engines, Vehicles, and Equipment	CARB In-Use Off-Road Diesel Vehicle Regulation	Any relevant vehicle or machine use associated with the project will be subject to CARB standards. The CARB In-Use-Off-Road Diesel Vehicle Regulation applies to certain off-road diesel engines, vehicles, or equipment greater than 25 horsepower. The regulation: 1) imposes limits on idling, requires a written idling policy, and requires a disclosure when selling vehicles; 2) requires all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System) and labeled; 3) restricts the adding of older vehicles into fleets starting

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Table 23
Applicable Greenhouse Gas-Related Laws and Regulations

Project Component	Applicable Laws/Regulations	GHG Reduction Measures Required for Project
		on January 1, 2014; and 4) requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (i.e., exhaust retrofits). The requirements and compliance dates of the Off-Road regulation vary by fleet size, as defined by the regulation.
	Cap-and-Trade Program	Transportation fuels (e.g., gasoline) used in equipment operation would be subject to the Cap-and-Trade Program. (See "Energy Use," below.)
Greening New Construction	CALGreen Code	All new construction, including the project, must comply with CALGreen Code, as discussed in more detail throughout this table. Adoption of the mandatory CALGreen Code standards for construction has been essential for improving the overall environmental performance of new buildings; it also sets voluntary targets for builders to exceed the mandatory requirements.
Construction Waste	CALGreen Code	The project will be subject to CALGreen Code requirements for construction waste reduction, disposal, and recycling, such as a requirement to recycle and/or salvage for reuse a minimum of 50% of the non-hazardous construction waste in accordance with Section 5.408.1.1, 5.408.1.2, or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent.
Worker, vendor and truck vehicle trips (on-road vehicles)	Cap-and-Trade Program	Transportation fuels (e.g., gasoline) used in worker, vendor and truck vehicle trips would be subject to the Cap-and-Trade Program.
<i>Solid Waste</i>		
Solid Waste Management	Landfill Methane Control Measure	Waste associated with the project will be disposed per state requirements for landfills, material recovery facilities, and transfer stations. Per the statewide GHG emissions inventory, the largest emissions from waste management sectors come from landfills, and are in the form of CH ₄ . In 2010, CARB adopted a regulation that reduces emissions from methane in landfills, primarily by requiring owners and operators of certain uncontrolled municipal solid waste landfills to install gas collection and control systems, and requires existing and newly installed gas and control systems to operate in an optimal manner. The regulation allows local air districts to voluntarily enter into a memorandum of understanding with CARB to implement and enforce the regulation and to assess fees to cover costs of implementation.
	Mandatory Commercial Recycling (AB 341)	AB 341 will require the project, if it generates four cubic yards or more of commercial solid waste per week, to arrange for recycling services, using one of the following: self-haul; subscribe to a hauler(s); arranging for pickup of recyclable materials;

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Table 23
Applicable Greenhouse Gas-Related Laws and Regulations

Project Component	Applicable Laws/Regulations	GHG Reduction Measures Required for Project
		<p>subscribing to a recycling service that may include mixed waste processing that yields diversion results comparable to source separation.</p> <p>The project will also be subject to local commercial solid waste recycling program required to be implemented by each jurisdiction under AB 341.</p>
	CALGreen Code	The project will be subject to CALGreen Code requirement to provide areas that serve the entire building and are identified for the depositing, storage and collection of nonhazardous materials for recycling (CALGreen Code Section 5.410.1)
<i>Energy Use</i>		
Electricity/Natural Gas Generation	Cap-and-Trade Program	<p>Electricity and natural gas usage associated with the project will be subject to the Cap-and-Trade Program.</p> <p>The rules came into effect on January 1, 2013, applying to large electric power plants and large industrial plants. In 2015, importers and distributors of fossil fuels were added to the Cap-and-Trade Program in the second phase.</p> <p>Specifically, on January 1, 2015, cap-and-trade compliance obligations were phased in for suppliers of natural gas, reformulated gasoline blendstock for oxygenate blending (RBOB), distillate fuel oils, and liquefied petroleum gas that meet or exceed specified emissions thresholds. The threshold that triggers a cap-and-trade compliance obligation for a fuel supplier is 25,000 metric tons or more of CO_{2e} annually from the GHG emissions that would result from full combustion or oxidation of quantities of fuels (including natural gas, RBOB, distillate fuel oil, liquefied petroleum gas, and blended fuels that contain these fuels) imported and/or delivered to California.</p>
Renewable Energy	California RPS (SB X1-2, SB 350, and SB 100)	<p>Energy providers associated with the project will be required to comply with RPS set by SB X1 2, SB 350, and SB 100.</p> <p>SB X1 2 requires investor-owned utilities, publicly-owned utilities, and electric service providers to increase purchases of renewable energy such that at least 33% of retail sales are procured from renewable energy resources by December 31, 2020. In the interim, each entity was required to procure an average of 20% of renewable energy for the period of January 1, 2011 through December 31, 2013; and will be required to procure an average of 25% by December 31, 2016, and 33% by 2020.</p> <p>SB 350 requires retail sellers and publicly owned utilities to procure 50% of their electricity from eligible renewable energy resources by 2030.</p> <p>SB 100 increased the standards set forth in SB 350 establishing that 44% of the total electricity sold to retail customers in California per year by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030, be secured from qualifying renewable energy</p>

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Project Component	Applicable Laws/Regulations	GHG Reduction Measures Required for Project
		sources. SB 100 states that it is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100% of the retail sales of electricity to California by 2045.
	Million Solar Roofs Program (SB 1)	The project will participate in California's energy market, which is affected by implementation of the Million Solar Roofs Program. As part of Governor Schwarzenegger's Million Solar Roofs Program, California has set a goal to install 3,000 megawatts of new, solar capacity through 2016. The Million Solar Roofs Program is a ratepayer-financed incentive program aimed at transforming the market for rooftop solar systems by driving down costs over time.
	California Solar Initiative- Thermal Program	The project will participate in California's energy market, which is affected by implementation of the California Solar Initiative - Thermal Program. The program offers cash rebates of up to \$4,366 on solar water heating systems for single-family residential customers. Multifamily and Commercial properties qualify for rebates of up to \$800,000 on solar water heating systems and eligible solar pool heating systems qualify for rebates of up to \$500,000. Funding for the California Solar Initiative-Thermal program comes from ratepayers of Pacific Gas & Electric, SCE, Southern California Gas Company, and San Diego Gas & Electric. The rebate program is overseen by the CPUC as part of the California Solar Initiative.
	Waste Heat and Carbon Emissions Reduction Act (AB 1613, AB 2791)	The project will participate in California's energy market, which is affected by implementation of the Waste Heat and Carbon Emissions Reduction Act. Originally enacted in 2007 and amended in 2008, this act directed the CEC, CPUC, and CARB to implement a program that would encourage the development of new combined heat and power systems in California with a generating capacity of not more than 20 megawatts, to increase combined heat and power use by 30,000 gigawatt-hour. The CPUC publicly owned electric utilities, and CEC duly established policies and procedures for the purchase of electricity from eligible combined heat and power systems. CEC guidelines require combined heat and power systems to be designed to reduce waste energy; have a minimum efficiency of 60%; have NO _x emissions of no more than 0.07 pounds per megawatt-hour; be sized to meet eligible customer generation thermal load; operate continuously in a manner that meets expected thermal load and optimizes efficient use of waste heat; and be cost effective, technologically feasible, and environmentally beneficial.
<i>Vehicle/Mobile Sources</i>		

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Project Component	Applicable Laws/Regulations	GHG Reduction Measures Required for Project
General	SB 375 and SCAG RTP/SCS	The project complies with, and is subject to, the SCAG adopted RTP/SCS, which CARB approved as meeting its regional GHG targets in 2016.
Fuel	Low Carbon Fuel Standard (LCFS)/ EO S-01-07	Auto trips associated with the project will be subject to LCFS (EO S-01-07), which requires a 10% or greater reduction in the average fuel carbon intensity by 2020 with a 2010 baseline for transportation fuels in California regulated by CARB. The program establishes a strong framework to promote the low carbon fuel adoption necessary to achieve the Governor's 2030 and 2050 GHG goals.
	Cap-and-Trade Program	Use of gasoline associated with the project will be subject to the Cap-and-Trade Program. The rules came into effect on January 1, 2013, applying to large electric power plants and large industrial plants. In 2015, importers and distributors of fossil fuels were added to the Cap-and-Trade Program in the second phase. Specifically, on January 1, 2015, cap-and-trade compliance obligations were phased in for suppliers of natural gas, RBOB, distillate fuel oils, and liquefied petroleum gas that meet or exceed specified emissions thresholds. The threshold that triggers a cap-and-trade compliance obligation for a fuel supplier is 25,000 MT or more of CO ₂ e annually from the GHG emissions that would result from full combustion or oxidation of quantities of fuels (including natural gas, RBOB, distillate fuel oil, liquefied petroleum gas, and blended fuels that contain these fuels) imported and/or delivered to California.
Automotive Refrigerants	CARB Regulation for Small Containers of Automotive Refrigerant	Vehicles associated with the project will be subject to CARB's Regulation for Small Containers of Automotive Refrigerant. (CCR, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 5, Section 95360 et seq.) The regulation applies to the sale, use, and disposal of small containers of automotive refrigerant with a GWP greater than 150. The regulation achieves emission reductions through implementation of four requirements: 1) use of a self-sealing valve on the container, 2) improved labeling instructions, 3) a deposit and recycling program for small containers, and 4) an education program that emphasizes best practices for vehicle recharging. This regulation went into effect on January 1, 2010 with a one-year sell-through period for containers manufactured before January 1, 2010. The target recycle rate is initially set at 90%, and rises to 95% beginning January 1, 2012.
Light-Duty Vehicles	AB 1493 (or the Pavley Standard)	Cars that drive to and from the project will be subject to AB 1493, which directed CARB to adopt a regulation requiring the maximum feasible and cost effective reduction of GHG emissions from new passenger vehicles.

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Project Component	Applicable Laws/Regulations	GHG Reduction Measures Required for Project
		Pursuant to AB 1493, CARB adopted regulations that establish a declining fleet average standard for CO ₂ , CH ₄ , N ₂ O, and HFCs (air conditioner refrigerants) in new passenger vehicles and light-duty trucks beginning with the 2009 model year and phased-in through the 2016 model year. These standards are divided into those applicable to lighter and those applicable to heavier portions of the passenger vehicle fleet. The regulations will reduce “upstream” smog-forming emissions from refining, marketing, and distribution of fuel.
	Advanced Clean Car and ZEV Programs	Cars that drive to and from the project will be subject to the Advanced Clean Car and ZEV Programs. In January 2012, CARB approved a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot and global warming gases and requirements for greater numbers of zero-emission vehicles into a single package of standards called Advanced Clean Cars. By 2025, new automobiles will emit 34% fewer global warming gases and 75% fewer smog-forming emissions. The ZEV program will act as the focused technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles in the 2018-2025 model years.
	Tire Inflation Regulation	Cars that drive to and from the project will be subject to the CARB Tire Inflation Regulation, which took effect on September 1, 2010, and applies to vehicles with a gross vehicle weight rating of 10,000 pounds or less. Under this regulation, automotive service providers must, inter alia, check and inflate each vehicle's tires to the recommended tire pressure rating, with air or nitrogen, as appropriate, at the time of performing any automotive maintenance or repair service, and to keep a copy of the service invoice for a minimum of three years, and make the vehicle service invoice available to the CARB, or its authorized representative upon request.
	EPA and NHTSA GHG and CAFE standards.	Mobile sources that travel to and from the project would be subject to EPA and NHTSA GHG and CAFE standards for passenger cars, light-duty trucks, and medium-duty passenger vehicles. (75 FR 25324–25728 and 77 FR 62624–63200.)
Medium- and Heavy-Duty Vehicles	CARB In-Use On-Road Heavy-Duty Diesel Vehicles Regulation (Truck and Bus Regulation)	Any heavy-duty trucks associated with the project will be subject to CARB standards. The regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. Newer heavier trucks and buses must meet PM filter requirements. Lighter and older heavier trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent.

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Project Component	Applicable Laws/Regulations	GHG Reduction Measures Required for Project
		The regulation applies to nearly all privately and federally owned diesel fueled trucks and buses and to privately and publicly owned school buses with a gross vehicle weight rating greater than 14,000 pounds.
	CARB In-Use Off-Road Diesel Vehicle Regulation	Any relevant vehicle or machine use associated with the project will be subject to CARB standards. The CARB In-Use-Off-Road Diesel Vehicle Regulation applies to certain off-road diesel engines, vehicles, or equipment greater than 25 horsepower. The regulations: 1) imposes limits on idling, requires a written idling policy, and requires a disclosure when selling vehicles; 2) requires all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System) and labeled; 3) restricts the adding of older vehicles into fleets starting on January 1, 2014; and 4) requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (i.e., exhaust retrofits). The requirements and compliance dates of the Off-Road regulation vary by fleet size, as defined by the regulation.
	Heavy-Duty Vehicle GHG Emission Reduction Regulation	Any relevant vehicle or machine use associated with the project will be subject to CARB standards. The CARB Heavy-Duty Vehicle GHG Emission Reduction Regulation applies to heavy-duty tractors that pull 53-foot or longer box-type trailers. (CCR, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 1, Section 95300 et seq.) Fuel efficiency is improved through improvements in tractor and trailer aerodynamics and the use of low rolling resistance tires.
	EPA and NHTSA GHG and CAFE standards.	Mobile sources that travel to and from the project would be subject to EPA and NHTSA GHG and CAFE standards for medium- and heavy-duty vehicles. (76 FR 57106–57513.)
<i>Water Use</i>		
Water Use Efficiency	Emergency State Water Board Regulations	Water use associated with the project will be subject to emergency regulations. On May 18, 2016, partially in response to EO B-27-16, the State Water Board adopted emergency water use regulations (CCR, title 23, Section 864.5 and amended and re-adopted Sections 863, 864, 865, and 866). The regulation directs the State Water Board, Department of Water Resources, and CPUC to implement rates and pricing structures to incentivize water conservation, and calls upon water suppliers, homeowners' associations, California businesses, landlords and tenants, and wholesale water agencies to take stronger conservation measures.
	EO B-37-16	Water use associated with the project will be subject to Emergency EO B-37-16, issued May 9, 2016, which directs the State Water Resources Control Board to adjust emergency water

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Project Component	Applicable Laws/Regulations	GHG Reduction Measures Required for Project
		conservation regulations through the end of January, 2017 to reflect differing water supply conditions across the state. The Water Board must also develop a proposal to achieve a mandatory reduction of potable urban water usage that builds off the mandatory 25% reduction called for in EO B-29-15. The Water Board and Department of Water Resources will develop new, permanent water use targets to which the project will be subject. The Water Board will permanently prohibit water-wasting practices such as hosing off sidewalks, driveways, and other hardscapes; washing automobiles with hoses not equipped with a shut-off nozzle; using non-recirculated water in a fountain or other decorative water feature; watering lawns in a manner that causes runoff, or within 48 hours after measurable precipitation; and irrigating ornamental turf on public street medians.
	EO B-40-17	EO B-40-17 lifted the drought emergency in all California counties except Fresno, Kings, Tulare, and Tuolumne. It also rescinds EO B-29-15, but expressly states that EO B-37-16 remains in effect and directs the State Water Resources Control Board to continue development of permanent prohibitions on wasteful water use to which the project will be subject.
	SB X7-7	Water provided to the project will be affected by SB X7-7's requirements for water suppliers. SB X7-7, or the Water Conservation Act of 2009, requires all water suppliers to increase water use efficiency. It also requires, among other things, that the Department of Water Resources, in consultation with other state agencies, develop a single standardized water use reporting form, which would be used by both urban and agricultural water agencies.
	CALGreen Code	The project is subject to CALGreen Code's water efficiency standards, including a required 20% mandatory reduction in indoor water use. (CALGreen Code, Division 4.3.)
	California Water Code, Division 6, Part 2.10, Sections 10910–10915.	Development and approval of the project requires the development of a project-specific Water Supply Assessment.
	Cap-and-Trade Program	Electricity usage associated with water and wastewater supply, treatment and distribution would be subject to the Cap-and-Trade Program.
	California RPS (SB X1-2, SB 350, SB 100)	Electricity usage associated with water and wastewater supply, treatment and distribution associated with the project will be required to comply with RPS set by SB X1-2, SB 350, and SB 100.

Notes: AB = Assembly Bill; CARB = California Air Resources Board; CEC = California Energy Commission; CFC = chlorofluorocarbon; CH₄ = methane; CO₂ = carbon dioxide; CO₂e = carbon dioxide equivalent; CPUC = California Public Utilities Commission; EO = Executive Order; EPA

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= Environmental Protection Agency; GHG = greenhouse gas; GWP = global warming potential; HCFC = hydrochlorofluorocarbon; HFC = hydrofluorocarbon; gpm = gallons per minute; MT = metric tons; N₂O = nitrous oxide; NHTSA = National Highway Traffic Safety Administration; PM = particulate matter; RPS = Renewable Portfolio Standard; RTP/SCS = Regional Transportation Plan/Sustainable Communities Strategy; SB = Senate Bill; SCAG = Southern California Association of Governments; VOC = volatile organic compound; ZEV = zero emission vehicle

As shown, the project would be consistent with and would not conflict with the applicable GHG-reducing strategies of the state.

Consistency with SANDAG's San Diego Forward: the Regional Plan

SANDAG's Regional Plan is a regional growth-management strategy that targets per-capita GHG reduction from passenger vehicles and light-duty trucks in the San Diego region. The Regional Plan will integrate land use and transportation strategies to meet GHG emissions reduction targets that are forecasted to achieve the state's 2035 and 2050 GHG reduction goals. The State's targets for San Diego County are a 7% reduction per capita in GHG emissions by 2020 compared to 2005 and a 13% reduction by 2035. The 2050 RTP would exceed the 2020 and 2035 reduction goals (SANDAG 2015). Regarding consistency with SANDAG's Regional Plan, the Project would include site design elements and Project design features developed to support the policy objectives of the RTP and SB 375. The convenient availability of walking and bicycling trails and parks (including the Laguna Riviera City Park and trail) that are accessible for use by residents will serve to reduce VMT. Finally, because this Project is an infill project, it would have inherently fewer VMT than a project located at the outskirts of a city. Implementation of the Project would result in an increase in 298 residential units. The most recent Regional Housing Needs Assessment from SANDAG stated that Carlsbad needs to build 430 units per year from 2021 through 2029 (SANDAG 2019). Furthermore, the City projected a deficit of 1,062 very-low and low income units and 238 moderate and above moderate income units (City of Carlsbad 2019a). The Project is expected to bring 298 units to market in 2025, of which 46 will be affordable.

Table 24 illustrates the Project's consistency with all applicable goals and policies of *San Diego Forward: The Regional Plan* (SANDAG 2015).

Table 24
San Diego Forward: The Regional Plan Consistency Analysis

Category	Policy Objective or Strategy	Consistency Analysis
<i>The Regional Plan – Policy Objectives</i>		
Mobility Choices	Provide safe, secure, healthy, affordable, and convenient travel choices between the places where people live, work, and play.	<i>Consistent.</i> The Project incorporates smart growth and sustainable design principles in its development plan. More specifically, the Project's design and compact setting facilitates a comprehensive, multi-modal transportation network and puts more people in areas that are more accessible to a range

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Table 24
San Diego Forward: The Regional Plan Consistency Analysis

Category	Policy Objective or Strategy	Consistency Analysis
		of transportation options, including public transit. The design and locational attributes of the Project positively emphasize particular commuting choices and convenient access to the rest of the City and the region, which will reduce the number of vehicle trips and overall VMT.
Mobility Choices	Take advantage of new technologies to make the transportation system more efficient and environmentally friendly.	<i>Consistent.</i> The Project includes electric vehicle charging stations to support electric vehicle adoption. Additionally, the Project would not impair SANDAG's ability to employ new technologies to make travel more reliable and convenient.
Habitat and Open Space Preservation	Focus growth in areas that are already urbanized, allowing the region to set aside and restore more open space in our less developed areas.	<i>Consistent.</i> The Project would be located close to major urban and employment centers. As such, the Project proposes to develop future housing opportunities in an infill location that capitalizes on existing infrastructure rather than other non-developed areas—including open space areas, sensitive habitats, or areas otherwise constrained due to topography, flooding, or other factors.
Healthy and Complete Communities	Create great places for everyone to live, work, and play.	<i>Consistent.</i> The Project proposes new residential development in an infill location that would facilitate the creation of a more livable neighborhood that integrates residents into the existing community. The Project's design and compact mixed land use setting would improve land use access, as well as the neighborhood's multi-modal transportation network. The Project's internal circulation features would provide residents with the opportunity to access employment, recreational, and commercial uses via multiple modes of transportation. Additionally, the Project was designed to promote health and sustainability by focusing on a compact pattern of development and by offering many amenities to its residents within walking distance.

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Table 24
San Diego Forward: The Regional Plan Consistency Analysis

Category	Policy Objective or Strategy	Consistency Analysis
Healthy and Complete Communities	Connect communities through a variety of transportation choices that promote healthy lifestyles, including walking and biking.	<i>Consistent.</i> The Project's internal circulation features would provide residents with the opportunity to access employment, recreational, and commercial uses via multiple modes of transportation. The Project would also encourage non-vehicular modes of transportation through its proximate location to nearby amenities.
Environmental Stewardship	Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living.	<i>Consistent.</i> The Project was designed to promote health and sustainability by focusing on a compact pattern of development. The Project includes electric-vehicle charging stations.
Environmental Stewardship	Support energy programs that promote sustainability.	<i>Consistent.</i> The Project would include on-site renewable energy production through solar photovoltaic rooftop systems.
<i>Sustainable Communities Strategy – Strategies</i>		
Strategy #1	Focus housing and job growth in urbanized areas where there is existing and planned transportation infrastructure, including transit.	<i>Consistent.</i> The Project would be located close to major urban and employment centers. The Project would provide a significant infill opportunity for the community. As such, the Project proposes to develop future housing opportunities in an infill location that capitalizes on existing infrastructure rather than other non-developed areas—including open space areas, sensitive habitats, or areas otherwise constrained due to topography, flooding, or other factors.
Strategy #2	Protect the environment and help ensure the success of smart growth land use policies by preserving sensitive habitat, open space, cultural resources, and farmland.	<i>Consistent.</i> The Project would be located close to major urban and employment centers. As such, the Project proposes to develop future housing opportunities in an infill location that capitalizes on existing infrastructure rather than other non-developed areas—including open space areas, sensitive habitats, or areas otherwise constrained due to topography, flooding, or other factors.
Strategy #3	Invest in a transportation network that gives people transportation choices and reduces greenhouse gas emissions.	<i>Consistent.</i> The Project would help reduce greenhouse gas emissions from vehicles in the region compared to a non-infill project.

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Table 24
San Diego Forward: The Regional Plan Consistency Analysis

Category	Policy Objective or Strategy	Consistency Analysis
Strategy #4	Address the housing needs of all economic segments of the population.	<i>Consistent.</i> With a variety of housing types and choices, the Project seeks to increase the housing supply and the mix of housing sizes, tenure, and affordability in the City. These housing types would support a range of buyers from various categories.

Source: SANDAG 2015

Notes: City = City of Carlsbad; Project = Marja Acres Community Plan; SANDAG = San Diego Association of Governments.

As shown in Table 24, the Project is consistent with all applicable Regional Plan Policy Objectives or Strategies. SANDAG worked with the local jurisdictions to identify Regional Housing Needs Assessment allocation options that meet the four goals of housing element law (Government Code Section 65484(d)(1)-(4)) within the Regional Plan. The second of the four objectives of the SANDAG Regional Housing Needs Assessment is to promote infill development and socioeconomic equity, the protection of environmental and agricultural resources, and the encouragement of efficient development patterns. Also, one of the key achievements projected for the Regional Plan is for nearly three-quarters of multi-family housing to be built on redevelopment or infill sites. This Project would be consistent with that goal as it would be developed on an infill site.

In summary, the Project promotes a pedestrian experience for the Project's residents and visitors that facilitates non-vehicular travel, consistent with SB 375 and SANDAG's Regional Plan. As shown in Table 24, the Project would be consistent with policy objectives of SANDAG's Regional Plan. Impacts would be less than significant.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

The Project's impact would be less than significant prior to mitigation.

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Appendix J

Marja Acres VMT Analysis

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VEHICLE MILES TRAVELED ANALYSIS

MARJA ACRES

Carlsbad, California
May 12, 2020

LLG Ref. 3-16-2608

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EXECUTIVE SUMMARY

Linscott, Law & Greenspan, Engineers (LLG) has prepared the following Vehicle Miles Traveled Analysis to determine the impacts on Vehicle Miles Traveled (VMT) for the Marja Acres mixed-use project (Project) in the City of Carlsbad (City). This VMT analysis has been prepared based on guidance from the City, utilizing methodologies presented in their Draft *Vehicle Miles Traveled (VMT) Analysis Guidelines* (March 27, 2020). These methodologies have been created to assist with implementation of Senate Bill 743 (SB 743), which resulted in a shift in the measure of effectiveness for determining transportation impacts from Level of Service (LOS) and vehicular delay to VMT. VMT analyses are required for use in all California Environmental Quality Act (CEQA) documents no later than July 1, 2020.

Consistent with the City's draft guidelines, Project VMT was established using the regional SANDAG Series 13 Base Year 2012 Travel Demand Model, customized to reflect the Project's unique attributes. The City Average VMT per Capita provided by the City of Carlsbad was used to establish the significance criteria threshold, which is 15% VMT per capita below the City Average. This is consistent with the Governor's Office of Planning and Research (OPR) Technical Advisory guidance. For residential projects in the City of Carlsbad, this threshold is calculated to be 19.14 VMT per capita. Thus, any Project VMT per capita that exceeds this significance threshold is considered a significant impact and requires mitigation.

Based on the customized regional traffic model results, the VMT per capita for the Marja Acres Project is 20.70 VMT per capita, which exceeds the established significance threshold by 7.54%. Thus, mitigation is required.

The City's draft guidelines suggest the use of CAPCOA as a measure to quantify VMT reductions that would occur either by the design and location of the Project ("Land Use/ Location Measures"), or reductions due to commute reduction programs initiated by the applicant ("Commute Trip Reduction Measures". In total, the effects of two (2) Land Use/ Location Measures and three (3) Commute Trip Reduction Measures were evaluated. Other Land Use/ Location Measures were considered but conservatively not included to avoid any potential double-counting with the SANDAG model results.

The resulting analysis using CAPCOA methodologies indicated that the Land Use/ Location benefits combined with the provision of Commute Trip Reduction measures collectively would result in a VMT reduction of 10.29%, exceeding the Project's excessive VMT per capita of 7.54% and sufficiently mitigates the Project's VMT impact. Funding for these mitigation measures is proposed to be provided through a combination of builder contributions and HOA assessments and will be administered through a Transportation Demand Management (TDM) program which is required of the Project.

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APPENDIX

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DRAFT VEHICLE MILES TRAVELED ANALYSIS

MARJA ACRES

City of Carlsbad, California

May 12, 2020

1.0 INTRODUCTION

The proposed Marja Acres project (Project) is a mixed-use infill redevelopment project located in the City of Carlsbad (City). The site is located on the south side of El Camino Real between Kelly Drive and West Ranch Road/ Lisa Street, directly across from the Robertson Ranch master planned development in the City of Carlsbad.

The site is currently developed with about 12,370 square feet (SF) of commercial space. The mixed-use Project would redevelop the existing site to provide 252 townhomes, 46 age-restricted multi-family units, and a maximum of 10,000 SF of retail/commercial redevelopment on the site.

Project access is proposed via two unsignalized right-in/right-out driveways to El Camino Real, consistent with the existing development.

Land uses to the north of the Project include the Robertson Ranch master planned community (residential and retail). To the south and east are single-family home neighborhoods. To the west are single family neighborhoods as well as the Kelly Elementary School and the Laguna Riviera City Park (0.5 miles by foot).

The Project site is proximate to the local serving Route 309 and 323 bus services. Route 309 provides service from Oceanside to Encinitas via El Camino Real, serving the El Camino Real SPRINTER Station. Route 323 provides service from the College Boulevard SPRINTER Station to Quarry Creek. Additional stops including Carlsbad High School and Sage Creek High School are served on school days during the regular school year. The nearest stops within walking distance of the Project for both routes are located on El Camino Real at Kelly Drive (0.2 miles to the west) and at West Ranch Road/Lisa Street (0.2 miles to the east).

This Vehicle Miles Traveled (VMT) analysis studies the potential transportation impacts due to the Project on VMT to satisfy the California Environmental Quality Act (CEQA) guidelines which utilize VMT as the measure of effectiveness.

This study includes the following:

- Vehicle Miles Traveled: Overview and Background
- City of Carlsbad Draft Technical Guidance
- Project VMT Calculations and Analysis Results
- Transportation Demand Management
- VMT Reduction Strategies
- VMT Impacts Summary and Implementation

The study is based on the City's *Draft Vehicle Miles Traveled (VMT) Analysis Guidelines* dated March 27, 2020.

2.0 VEHICLES MILES TRAVELED: OVERVIEW AND BACKGROUND

This section presents an overview and background on the VMT and the implementation of California State Law Senate Bill 743 (SB 743) requiring its use in the evaluation of transportation impacts for CEQA. It should be noted that Level of Service evaluation is still required to ensure conformance with the standards set in the City's Growth Management Plan (GMP), and a Local Mobility Analysis addressing this requirement has been prepared by LLG.

At the time this report was prepared, the City of Carlsbad was in the process of preparing draft guidelines for VMT evaluation. LLG obtained and reviewed the City's *Draft Vehicle Miles Traveled (VMT) Analysis Guidelines* (Draft Guidelines) dated March 27, 2020. As such, the approach and methodology contained in this report represents the draft guidance presented in that document.

2.1 VMT Background

VMT is defined as the "amount and distance of automobile travel attributable to a project" per CEQA Guidelines Section 15064.3. VMT is a measure of the use and efficiency of the transportation network as well land uses in a region. VMTs are calculated based on individual vehicle trips generated and their associated trip lengths. VMT accounts for two-way (roundtrip) travel and is estimated for a typical weekday for the purposes of measuring transportation impacts. For mixed-use (but primarily residential) projects like the Marja Acres Project, "VMT per capita" is the efficiency metric used for evaluation. VMT per capita is defined as the total daily miles of vehicle travel divided by the total population. VMT per capita as used in this study are calculated for both the City of Carlsbad (City wide VMT), and the Project (Project VMT). The VMT per capita reviewed in the SANDAG model and analysis is "tour-based" VMT, which represents the collective distance traveled in a home-to-home trip. For example, a trip from home, to a coffee shop, to work, then to lunch and back, then from work to the gym then home in a day would represent a "tour".

2.2 Senate Bill 743

In September 2013, the Governor's Office signed SB 743 into law, starting a process that fundamentally changes the way transportation impact analysis is conducted under CEQA. Within the State's CEQA Guidelines, these changes include the elimination of Auto Delay, level of service (LOS), and similar measurements of vehicular roadway capacity and traffic congestion as the basis for determining significant impacts. The guidance identifies VMT as the most appropriate CEQA transportation metric, along with the elimination of Auto Delay/LOS for CEQA purposes statewide. The justification for this paradigm shift is that Auto Delay/LOS impacts lead to improvements that increase roadway capacity and therefore induce more traffic and greenhouse gas emissions. The legislation was also intended to incentivize development in and around Transit Priority Areas (TPAs) and High-Quality Transit Corridors (HQTCs), and to encourage high density infill and mixed-use projects. The three (3) stated goals of the SB 743 legislation as defined in SB 743, the Public Resources Code section 21099, and the OPR Technical Advisory are 1.) promote the reduction of greenhouse gas emissions, 2.) the development of multimodal transportation networks, and 3.) a diversity of land uses

In January 2016, the Governor’s Office of Planning and Research (OPR) issued Draft Guidance, which provided recommendations for updating the State’s CEQA Guidelines in response to SB 743 and recommended practice for VMT analysis in an accompanying “*Technical Advisory on Evaluating Transportation Impacts in CEQA*” (Technical Advisory). OPR’s most recent Technical Advisory is dated December 2018 and is cited as a leading source of the thresholds and methodology contained in the City’s Draft Guidelines.

3.0 CITY OF CARLSBAD DRAFT TECHNICAL GUIDANCE

The following information is sourced from the City's Draft Guidelines.

3.1 Need for a Study

The Project was reviewed against the City's draft screening criteria to determine if a VMT study is necessary. The City's Draft Guidelines identify the following seven (7) cases where a development project would be considered to screen out of a VMT analysis based on a presumption that its VMT effects would be less than significant:

1. Small Projects (less than 110 ADT)
2. Projects Located Near Transit (projects located within one-half mile of the Carlsbad Village or Carlsbad Poinsettia Coaster Stations, or within one-half mile of the Plaza Camino Real Transit Station)
3. Local-Serving Retail and Similar Land Uses (defined as retail development less than 50,000 SF, or larger than 50,000 SF with a market study showing it serves primarily local uses)
4. Local Serving Public Facilities (i.e. government uses, parks and public schools, etc.)
5. Affordable Housing Projects (residential projects that are 100% affordable located within infill areas)
6. Redevelopment Projects That Result in a Net Reduction in VMT (projects that replace an existing development with a more efficient land use)
7. Projects Located in Efficient VMT Areas (projects that lie within high efficiency areas of Carlsbad as shown on the City's screening map)

The LOS analysis prepared for the proposed mixed-use, infill Project shows it will generate a 3,070 gross ADT, with a net increase of 2,059 ADT with the existing retail uses removed. The Project is not located within one-half mile of the identified transit centers and provides modest retail (10,000 SF total) and approximately 15% of senior housing. It does not result in less VMT than the existing local serving retail uses it replaces, and it is not located in an efficient VMT area based on the City's screening map. As such, the Project requires a VMT analysis.

3.2 Analysis Methodology

The City's Draft Guidelines provide guidance on how project VMT is obtained for the following four (4) different types of projects:

1. Single Land-Use Projects
2. Mixed-Use Projects
3. Redevelopment Projects
4. Regional Retail Projects

For the purposes of this analysis, the Project was evaluated as a mixed-use project (retail and residential). Retail development falls into a category which is neither considered to be residential nor employment based. The proposed 10,000 SF of retail is local-serving. The OPR Technical Advisory advises that "if the project leads to a net increase in provision of locally-serving retail, transportation impacts from the retail portion of the development should be presumed to be less than significant." OPR's Technical Advisory also recommends that lead agencies determine which retail projects are local-serving, but it does include a general guideline that retail projects larger than 50,000 SF might be considered regional-serving rather than local serving.

Per the City's Draft Guidelines, "local-serving retail within a mixed-use development can be presumed to have a less than significant VMT impact and excluded from analysis." Given the Project's retail/commercial component is 10,000 SF, it can clearly be categorized as local serving. Therefore, no further evaluation of the retail component is warranted or provided.

With redevelopment of the site, the Project is calculated to generate 2,059 net new ADT per the Transportation Impact Analysis prepared by LLG dated March 26, 2019. Using the residential land use as the primary metric, the Project was evaluated using VMT per capita. The City's Draft Guidelines indicate that a project generating less than 2,400 ADT would utilize VMT values obtained from the City's screening maps. At the time this report was conducted, the screening maps were not available. Instead, LLG prepared a Project-specific model using the SANDAG regional travel demand model, consistent with the Draft Guidelines' direction for projects exceeding 2,400 ADT. More information on the model development is contained in *Section 4.1* of this report.

Table 4-1 below shows the Project land use and synthetic population inputs used to conduct the VMT per capita analysis:

**TABLE 4-1
SANDAG MODEL LAND USE AND POPULATION INPUTS**

Land Use	Quantity	Population
Market Rate Multi-Family	252	587 residents
Age-Restricted Multi-Family	46	88 residents
Restaurant	4 KSF	16 employees
Retail	6 KSF	7 employees

General Notes:

1. Residential population calculated assuming 2.68 persons per household for market rate multi-family and 1.91 persons per household for age-restricted multi-family. Vacancy factor of 0.87 applied to market rate for 219 total households. For age-restricted, 0% vacancy assumed. Sourced to SANDAG Series 13 Carlsbad area household inputs and vacancy rates. **Appendix A** contains the SANDAG modeling data.
2. Employee population uses SANDAG Series 13 employment rates for “restaurant/bar” and “retail” land uses.

Once the model inputs were adjusted to reflect the Project’s specific development details, the VMT per capita results were computed. It should be noted as previously mentioned, the commercial component’s VMT would screen out of required analysis due to its modest size. However, for purposes of accurately calculating VMT per capita for the residents within a mixed-use project, the retail/restaurant land uses were coded into the model.

Table 4-2 shows the Project VMT analysis. Based the model outputs, the Project VMT per capita is 20.70. **Appendix A** contains the VMT model data.

**TABLE 4-2
PROJECT VMT FINDINGS**

Scenario	City Average ^a	Significance Threshold (85% of City Average)	Project VMT ^b	Project VMT Over Threshold	% of Project VMT Over Significance Threshold	Transportation Impact? (Over Threshold)
Residential VMT per Capita	22.52	19.14	20.70	1.56	7.54	Yes

Footnotes:

- a. City Average VMT per capita based on the City of Carlsbad `2012 Vehicle Miles Traveled (VMT) Per Capita by Traffic Analysis Zone (TAZ) Comparison to City-Wide Average.
- b. Project VMT based on SANDAG Series 13 Base Year 2012 Travel Demand Model, customized to reflect the Project land uses.

The results of the Project VMT comparison indicate that as proposed, the Project would exceed the significance threshold by 7.54%. This would require implementation of mitigation measures that would result in a decrease of 1.56 VMT per capita (at least 7.54%) to reduce the Project's VMT impact to less-than-significant.

5.0 TRANSPORTATION DEMAND MANAGEMENT PLAN

Transportation Demand Management (TDM) is a set of strategies, programs, services, and physical elements that influence travel behavior by mode, frequency, time, route, or trip length in order to help achieve highly efficient and sustainable transportation facilities. TDM is aimed at decreasing Single Occupant Vehicles (SOV) by providing users with options to alternative forms of transportation and effectively providing information to users on how to access and use them as well as their benefits.

TDM can be beneficial to all users, including residents, property owners and managers, and the community as a whole. More importantly, it can be cost-effective and is environmentally sustainable and responsible. Additionally, the implementation of TDM measures and strategies can help offset and reduce the VMT impact of the project.

TDM services and measures provide residents with options for alternative forms of transportation and gives them the proper tools and information to choose what is best for them and how to utilize them efficiently. By utilizing TDM measures and strategies, residents are provided with mobility that may otherwise be unavailable or not feasible via SOV travel. For example, for those who do not or cannot drive, non-SOV travel options provide the mobility to maintain employment, go to school, go shopping, etc. For those who do drive, different travel options that are available can provide them with convenience and save them time and money by choosing the most efficient mode for their specific travel use and purpose. Having alternative forms of transportation and being informed of them and their benefits can also benefit residents through financial savings in fuel, vehicle maintenance, or not owning a vehicle at all.

Additionally, active forms of transportation such as walking and biking can provide residents with substantial health benefits. According to the American Heart Association, the recommended activity time to improve cardiovascular health is 30 minutes a day and incorporating walking and bicycling as a form of transportation provides an outlet for individuals to attain this recommendation.

TDM Benefits for Property Owners / Managers – Implementing TDM measures and strategies can also be beneficial to the Property Owners and Managers. The benefits that they offer can be a selling point for many potential buyers and residents. For example, alternative forms of transportation such as cycling and utilizing transit are increasingly becoming more popular, and benefits such as secure bike parking and easy/convenient connection to transit can be a huge draw for some. The property has benefits that TDM measures and strategies will have an advantage over other properties for some potential buyers.

TDM Benefits for the Community – TDM measures and strategies are all aimed at reducing congestion and increasing mobility and access, and by doing so the general quality of life of the community as a whole will be enhanced. Less vehicular traffic equates to less air pollution. Having this goal of reducing SOVs and providing alternative forms of transportation is environmentally sustainable and responsible and is for the general betterment of the community.

Vehicle Miles Traveled (VMT) Management – The Project's traffic impact can be measured by its addition of VMT to the regional roadway network. Due to the TDM's goal of reducing SOV and

promoting and supporting alternative modes of travel, the implementation of TDM measures and strategies can decrease the Project's VMT and can be an effective method of managing its impacts. Utilizing the *Quantifying Greenhouse Gas Mitigation Measures* resource manual developed by the California Air Pollution Control Officers Association (CAPCOA) and other resources used in the industry, this report outlines the measures and strategies that can be implemented by the Project and the VMT reduction associated with them. The details on each VMT reduction measure will be incorporated into a TDM program to be prepared by the Project at a later date.

This Project will be subject to the requirements of the City of Carlsbad TDM Handbook as a condition of approval. The Project, as required by the handbook, will be subject to monitoring and reporting of all TDM measures presented in the Project's forthcoming TDM program. The VMT mitigation measures presented in this report will be included in the Project's TDM program for monitoring and reporting. Additionally, a Transportation Coordinator shall be designated to administer the TDM program.

Applicable VMT reduction strategies both inherent to the Project and proposed as part of the TDM program are discussed further below in *Section 6.0* and *Section 7.0* of this report.

6.0 VMT REDUCTION STRATEGIES

As shown in *Table 4–2* of this report, the Project exceeds the allowable significance criteria by at 1.56 VMT per capita (7.54%) and must therefore provide quantifiable mitigation to reduce the VMT impacts by at least this amount. Mitigation for VMT impacts to residential projects would aim to achieve one or both of the following results:

- Reducing the number of daily vehicle trips (especially single-occupant vehicle trips), and/or
- Reducing the length of trips made by residents

The City’s Draft Guidelines contain *Appendix D – Vehicle Miles Traveled Reduction Strategies and Effectiveness Calculations* that present several quantifiable Transportation Demand Management (TDM) strategies that can be used to mitigate a project’s VMT impacts. As discussed in that document, TDM strategies can be quantified using methodologies described in *Quantifying Green House Gas Mitigation Measures* published by the California Air Pollution Control Officers Association (CAPCOA) in 2010.

The transportation demand management measures identified in the CAPCOA document that would potentially reduce residential mixed-use project VMT are grouped into five (5) categories:

1. Land Use/ Location (“LUT” series measures)
2. Neighborhood/ Site Enhancement (“SDT” series measures)
3. Parking Policy/ Pricing (“PDT” series measures)
4. Commute Trip Reduction Programs (“TRT” series measures)
5. Transit System Improvements (“TST” series measures)

Upon review of the various categories and their respective measures, some Land Use/ Location series measures would apply to overall Project VMT of 20.70 VMT per capita based on the intrinsic characteristics of the Project (e.g. mixed-use, suburban infill, proximity to transit, schools, employment, etc.). These types of measures would be considered “Project Design Features.” It should be noted that in the suburban context, the maximum reduction for any/all LUT measures is limited to 5%. The overall maximum reduction of all Transportation Measures combined is 15%.

Additionally, Commute Trip Reduction measures were identified that could be implemented to reduce the Project’s commute VMT by way of mitigation. The Project’s commute VMT is provided from the model and represents 33.60% of the overall Project VMT. It should be noted that in the suburban context, the maximum reduction for any/all TRT measures is limited to 15%. Again, the overall maximum reduction of all Transportation Measures combined is 15% for a suburban environment.

Both sets of CAPCOA measures are consistent with the City’s draft *Table 1: TDM Measure Summary* table contained in *Appendix B*.

6.1 Applicable CAPCOA Land Use/ Location Measures

Land use features are more appropriately termed “Project Design Features,” more so than mitigation measures. For purposes of consistency with the CAPCOA terminology, the term “Land Use Measure” is utilized in this report. The two (2) CAPCOA Land Use/ Location Measures considered applicable to the Project are:

- LUT-3: Increase Diversity of Urban and Suburban Developments (Mixed-Use)
- LUT-6: Integrate Affordable and Below Market Rate Housing

Consideration was also given to LUT-1 (“Increase Density”) and LUT-4 (“Increase Destination Accessibility”) which as stated provides credit for increased density and for proximity and accessibility to jobs or other attractions, respectively. The effective range of VMT reduction per CAPCOA for LUT-1 is 0.8 – 30%, while it is between 6.7 and 20% for LUT-4. It is acknowledged that the density and exact mix of land uses proposed was coded into the SANDAG model which generated the site’s VMT per capita. However, for LUT-4, it is difficult to extrapolate the number of jobs inputted into the base year model compared to the availability of jobs in the area today. A census report using the latest 2017 data is attached in *Appendix C*. This report shows the jobs available within a two-mile radius of the Project. Significant job clusters are present to the southeast and southwest of the site, with a lesser cluster to the northwest. In total, the report indicates that just over 22,000 jobs are available within this two-mile radius. The clusters along Cannon Road, College Boulevard and El Camino Real are all accessible via Class II bike lanes and transit. It would be likely that additional reductions in the Project VMT per capita would be calculated had the effects of all 22,000 jobs been included in the modeling effort. To provide for a conservative assessment, no additional reductions were taken for either land use measure to avoid the potential for double counting.

The following is brief overview of each Land Use/ Location measure used and its applicability to the Project. Relevant excerpts from CAPCOA for each measure are contained in *Appendix D*.

6.1.1 LUT-3: Increase Diversity of Urban and Suburban Developments (Mixed-Use)

This measure reflects the inherent reductions in VMT due to the placement of complementing land uses in close proximity to one another that may be accommodated by non-auto modes of transport. For example, when residential areas are in the same neighborhood as retail and office buildings, a resident does not need to travel outside of the neighborhood to meet his/her trip needs. The measure applies to projects in a suburban context such as Carlsbad and is applicable to residential and mixed-use projects such as Marja Acres.

A suburban project, such as Marja Acres, will need to have at least three (3) of the following on-site and/or off-site uses within ¼-mile: Residential Development, Retail Development, Park, Open Space, or Office.

As previously mentioned, this Project was coded into the SANDAG model to generate the Project’s VMT per capita. The mix of residential and retail/commercial land uses were included in the model which translates to a VMT per capita accounting for the synergy between these on-site land uses. The

model did not, however, account for the active and passive open space proposed on-site and the adjacent master planned community of Robertson Ranch that is made up of 200 acres of residential and recreational land uses and 12 acres of neighborhood commercial (within a ¼-mile distance of the proposed Project). As such, the application of LUT-3 was deemed appropriate to account for the Project's on-site open space and off-site Robertson Ranch land uses.

Below is the VMT reduction formula provided in CAPCOA LUT-3:

% VMT Reduction = Land Use * B [not to exceed 30%]; where:

- Land Use = Percentage increase in land use index v. single use development
- = (land use index – 0.15) / 0.15, where 0.15 refers to the single development land use index per CAPCOA Report Appendix C
- Land use index = $-a / \ln(6)$

$$a = \sum_{i=1}^6 a_i \times \ln(a_i)$$
 - a_i = building floor area of land use i/total square feet of area considered;
 - a_1 =single family residential, a_2 =multifamily residential, a_3 =commercial, a_4 =industrial, a_5 =institutional, a_6 =park
 - If a land use is not present, and a_i is equal to 0, a_i is set to 0.01
- B = Elasticity of VMT with respect to land use index (0.09 from [1])

More information regarding this methodology can be found in the CAPCOA Report page 163 for LUT-3.

Using the lot summary acreage information provided on the project tentative subdivision map, the land use proportions were broken down to 82% residential, 9% commercial, and 7% open space recreation. It should be noted that given the commercial component was factored into the model-generated VMT, the Robertson Ranch commercial project was not included in that model run and has an approximately 12-acre commercial component within a ¼-quarter mile walking distance. Therefore, it was appropriately assumed that an additional commercial reduction could be taken for the Project's proximity to this land use.

For Marja Acres, the % VMT reduction calculation is shown below:

- $a_1=0.01, a_2=0.82, a_3=0.10, a_4=0.01, a_5=0.01, a_6=0.08$
- $a = 0.01 * \ln(0.01) + 0.82 * \ln(0.82) + 0.10 * \ln(0.10) + 0.01 * \ln(0.01) + 0.01 * \ln(0.01) + 0.08 * \ln(0.08) = -0.73$
- Land Use Index = $-(-0.73) / \ln(6) = 0.407$
- Land Use = $(0.407-0.15) / 0.15 = 1.713$ or 171.3%
- % VMT Reduction = $171.3\% * 0.09 = \underline{15.42\%}$

CAPCOA's reported range of total VMT reduction for this locational project feature is 9 – 30%. Using the formulas in CAPCOA as shown above, the resulting individual strategy reduction is 15.42%.

6.1.2 LUT-6: Integrate Affordable and Below Market Rate Housing

This measure reflects the effect of income on the probability that a commuter will take transit to walk or work and acknowledges that lower income families tend to have lower levels of auto ownership. The measure applies to projects in a suburban context such as Carlsbad and is applicable to residential and mixed-use projects such as Marja Acres.

The Project is providing 46 units of age-restricted deed-restricted senior housing, out of a total of 298 units. This reflects 15% of the overall development. It should be noted that the Project includes 20% affordable units prior to the allowable density bonus attributed to the Project by providing the deed-restricted affordable units. For purposes of this analysis, the 15% affordable units factor was used in the calculation to be conservative.

The Project is located immediately adjacent to bus stops on El Camino Real, and directly across from the Robertson Ranch development which will include 12 acres of commercial/retail uses approximately ¼ mile from the Project.

Below is the VMT reduction formula provided in CAPCOA LUT-6:

% VMT Reduction = 4% * Percentage of units in project that are deed-restricted below market rate housing; where:

- VMT Reduction = 4% * 15% = 0.006
- % VMT Reduction = 0.6%

CAPCOA's reported range of total VMT reduction for this locational project feature is 0.04 – 1.20%. Using the formulas in CAPCOA with Project-specific inputs of 15% affordable housing, the resulting individual strategy reduction is 0.60%.

More information regarding this methodology can be found in the CAPCOA Report page 177 for LUT-6.

6.2 Applicable CAPCOA Commute Trip Reduction Programs for Residents

The three (3) CAPCOA Commute Trip Reduction Program measures proposed by the applicant to mitigate Project VMT impacts are:

- TRT-3: Provide Ride Sharing Programs
- TRT-4: Implement Subsidized or Discounted Transit Programs
- TRT-7: Implement Commute Trip Reduction Marketing

Measures TRT-3 and TRT-4 will be effectively marketed through details provided in TRT-7. The following is brief overview of each measure and its applicability to the Project. Relevant excerpts from CAPCOA for each measure are also contained in *Appendix D*.

6.2.1 TRT-3: Provide Ride Sharing Programs

This measure addresses the benefits of increasing the vehicle occupancy by ride sharing, which results in fewer cars driving the same trip. The ride sharing program will require a designated Transportation Coordinator and funding requirement (discussed later on in *Section 6.2.4* of this report). For the Project, this will be provided by the HOA and the Project's required TDM program. The measure applies to projects in a suburban context such as Carlsbad and is applicable to residential and mixed-use projects such as Marja Acres.

While applicable to residential and mixed-use projects, this measure is generally considered in the context of office projects, where a business has influence over its employees' travel patterns. The traditional office-oriented Ride Share Program would consist of incentivizing ride-shares/carpools with preferential parking (location or cost offsets) and promoting ride-share/carpool programs via a TDM Coordinator in the office. The proposed Project will coordinate with the Citywide TDM program and promote the use of any carpool platforms or applications utilized by the Citywide TDM program, such as RideAmigos or equivalent. *Appendix D – Vehicle Miles Traveled Reduction Strategies and Effectiveness Calculations* from the City's Draft Guidelines acknowledge that Transportation Network Companies (TNC's) such as Uber, Lyft and Waze all have pool options, which would be how individuals in a residential setting could utilize ride-sharing/carpooling to reduce commute VMT. Residents enrolled in the TNC pool program administered through the TDM program via the HOA would receive monthly subsidies. Another benefit from offering this program from the residential side is that 100% of residents would be eligible to take advantage of it, whereas office-provided programs could limit the eligibility.

Below is the VMT reduction formula provided in CAPCOA TRT-3:

$$\% \text{ VMT Reduction} = \text{Commute} * \text{Residents} * \text{VMT}$$

- Commute = % reduction in commute VMT (from [1])
- Residents = % residents eligible
- VMT = % commute VMT

For Marja Acres, the % VMT reduction calculation is shown below:

- % Reduction in Commute VMT = 5% (low-density suburb, CAPCOA page 228)
- % Residents Eligible = 100%
- % Commute VMT = 33.6%
- % VMT Reduction = 5% * 100% * 33.6% = 1.68%

CAPCOA's reported range of total VMT reduction for this commute reduction project mitigation measure is 1 – 15%. Based on the projected population demographics and development characteristics of the Marja Acres Project, a 1.68% VMT reduction is estimated to result from the establishment of a ridesharing and TNC support program.

It should be noted that the calculated CAPCOA reduction described above expressly relates to commute VMT, which is a subset of a project's overall VMT. In the traditional context of an employer-based rideshare program, this would be appropriate, as non-commute trips (before/after work hours and weekends) would not be served by a traditional ride-share/carpool program. By contrast, the residential based TNC pool subsidy program proposed by the applicant would apply to *all* Project trips, not just commute trips. Thus, the impact of the 1.68% reduction in commute VMT would be greater when considered against total Project VMT.

6.2.2 TRT-4: Implement Subsidized or Discounted Transit Program

This measure addresses the benefits of subsidizing or discounting daily or monthly transit passes. The subsidy program would be served by the Project's designated Transportation Coordinator and funding requirement per TRT-3 discussed above. For the Project, this will be provided by the Homeowner's Association and the Project's required TDM program. The measure applies to projects in a suburban context such as Carlsbad and is applicable to residential and mixed-use projects such as Marja Acres.

While applicable to residential and mixed-use projects, this measure is generally considered in the context of office projects, where a business has influence over its employees' travel patterns. The traditional transit subsidy Program would consist of incentivizing transit use through the provision of daily or monthly passes. In the residential context, a TDM Coordinator located in the residential HOA would administer the program.

Below is the VMT reduction formula provided in CAPCOA TRT-4:

% VMT Reduction = A * B * C * D; where:

- A = % reduction in commute vehicle trips (VT)
- B = % residents eligible
- C = Adjustment from Commute VT to Commute VMT
- D = Commute VMT

For Marja Acres, the % VMT reduction calculation is shown below:

- % reduction in commute VMT = 7.9% (based on a \$2.98 per day subsidy, see CAPCOA page 231)
- % residents eligible to participate = 100%
- adjustment from commute VT to VMT = 1 (CAPCOA Report, Appendix C)
- % commute VMT = 33.6%
- % VMT Reduction = 100% * 7.9% * 1 * 33.6% = 2.65%

CAPCOA's reported range of total VMT reduction for this commute reduction mitigation measure is 0.3 – 20%. Using the formulas in CAPCOA with Project-specific inputs of low-density suburb, a \$2.98 daily transit subsidy, and a 100% commuter eligibility factor, the transit subsidy corresponds to a 2.65% VMT reduction (CAPCOA TRT-4). The low-density suburb is defined by the following characteristics:

- Location relative to the regional core: these locations are typically 20 miles or more from a regional CBD
- Ratio or relationship between housing and jobs: jobs poor
- Density character:
 - Typical building heights in stories: one to two stories
 - Typical street pattern: curvilinear (cul-de-sac based)
 - Typical setbacks: parking is generally placed between the street and office or retail buildings; large lot residential is common
 - Parking supply: ample, largely surface-based
 - Parking prices: none
- Transit availability: limited bus service, with peak headways 30 minutes or more

The monthly NCTD regional pass is priced at \$72/month for adults and \$23/month for seniors. The Project is proposing a slightly higher daily subsidy than the \$2.98 required by CAPCOA at \$3.25/day, five days a week (\$65-per person monthly subsidy), this equates to an 90% subsidy for adults and 100% subsidy for seniors toward a monthly unlimited regional NCTD pass which includes buses, SPRINTER, and MTS bus, trolley and rapid service. For unlimited monthly Zone 2 Coaster service, the dollar amount constitutes a 40% subsidy for an adult pass and 100% subsidy for seniors.

NCTD Route 309 runs at 30-minute headways along El Camino Real and Route 323 provides morning and evening commute times connecting to the Carlsbad Village Transit Station.

Like TRT-3 above, eligibility for residents would be 100%, and with a monthly pass program, residential participants would be able to use transit for non-commute trips which comprise the majority of Project VMT. Like TRT-3, the universal nature of the subsidy would be expected to generate results in excess of the calculations which reflect reductions to commute-only trips. In order to validate the 2.65% reduction calculated applied for this VMT mitigation measure, the formula to determine the potential utilization factor for the transit subsidy should be calculated. Using the CAPCOA data, the number of eligible participants multiplied by the percent reduction correlating to the dollar amount offered is appropriate. Thus, 7.9% of all residents must participate in this program to qualify for the full reduction (7.9% * 100%).

6.2.3 TRT-7: Implement Commute Trip Reduction Marketing

This measure addresses the implementation of marketing strategies to reduce commute trips. Information sharing and marketing are important components to successful commute trip reduction

strategies. Implementing commute trip reduction strategies with a complementary marketing will result in higher VMT reductions. For the Project, this will be provided by the Homeowner's Association and the Project's required TDM program. The measure applies to projects in a suburban context such as Carlsbad and is applicable to residential and mixed-use projects such as Marja Acres.

The TDM program may be marketed to new and existing residents through a website maintained by the HOA, monthly email newsletter blasts, promotional materials made publicly visible in common areas, and through an information packet that would accompany HOA documents provided to new residents. These sources will include information regarding the ride-share, TNC pool options such as Uber, Lyft and Waze, and the financial incentive distributed on a regular basis to residents. Below is the VMT reduction formula provided in CAPCOA TRT-7:

% VMT Reduction = $A * B * C * D$; where:

- A = % reduction in commute vehicle trips (VT)
- B = % residents eligible
- C = Adjustment from Commute VT to Commute VMT
- D = Commute VMT

For Marja Acres, the % VMT reduction calculation is shown below:

- % reduction in vehicle trips = 4% (per [1] from CAPCOA page 241)
- % residents eligible = 100%
- adjustment from VT to VMT = 1.0 (per CAPCOA page 241, see Appendix C)
- % commute VMT = 33.6%
- % VMT Reduction = $4\% * 100\% * 1.0 * 33.6\% = \underline{1.34\%}$

CAPCOA's reported range of total VMT reduction for this commute reduction mitigation measure is 0.8 – 4%. Using the formulas in CAPCOA with Project-specific inputs and a 100% commuter eligibility factor, the TDM marketing program corresponds to a 1.34% VMT reduction (CAPCOA TRT-7).

6.2.4 *Transportation Coordinator*

As part of the TDM program, the Project will need to dedicate a person within the development to the role of "Transportation Coordinator (TC)." The TC would be responsible for monitoring the commute VMT reduction measures offered through the TDM program. The TC would likely be a member of the HOA board, or appointed as a liaison by the HOA. The duties that would be performed by the TC would include:

- Informing new residents of the various alternative transportation modes available in the area, including transit, biking, and walking.
- Facilitating the distribution of the \$65 per month transit subsidy to residents.

- Preparing promotional materials and homeowners information packets regarding the financially incentivized ride-share options outlined in the TDM program.
- Monitoring the TDM program to ensure a smooth running of the plan.

6.3 Summary of CAPCOA Trip Reduction Measures

CAPCOA acknowledges that individual strategy reductions are not additive, but rather multiplicative and weighted to address the fact that the impact of additional strategies becomes less as they provide incremental benefits to the overall reduction. Chapter 6 of the CAPCOA Report discusses the rules for combining strategies or measures for application to VMT reductions. A multiplicative formula is used to scale the overall reduction as follows:

- Overall % VMT Reduction = $1 - [(1-A) * (1-B) * (1-C) * (1-D) * \dots]$
- Where A, B, C, D, ... = individual mitigation strategy reduction percentages for the strategies to be combined in a given category

First, each category must be scaled prior to combining and scaling the total VMT reduction percentage. All LUT category reductions were first weighted, followed by all TRT reductions. Then two resulting percent reductions were weighted to arrive at the total Project VMT reduction. The following is a summary of the VMT reductions attributed to each of the individual strategies (organized in their respective TDM strategy categories as required in the CAPCOA methodology):

LUT Trip Reduction Measures

For the sum of the LUT measures described above, the scaled reduction is calculated at 15.33%, using the CAPCOA methodology, although a maximum of 5.0% overall is permitted for the LUT series. The calculations are shown below:

LUT-3 = 15.42%

LUT-6 = 0.60%

Total LUT Reduction = $1 - (1 - 15.42\%) * (1 - 0.6\%) = \mathbf{15.33\% \text{ (capped at 5\%)}}$

TRT Trip Reduction Measures

For the sum of the TRT measures described above, the scaled reduction is calculated at 5.57%, using the CAPCOA methodology. The calculations are shown below:

TRT-3 = 1.68%

TRT-4 = 2.65%

TRT-7 = 1.34%

Total TRT Reduction = $1 - (1 - 1.68\%) * (1 - 2.65\%) * (1 - 1.34\%) = \mathbf{5.57\%}$

Overall VMT Reduction:

$$1 - (1-5.00\%)*(1-5.57\%) = \underline{10.29\%}$$

6.4 Reduction Strategies Effectiveness

The intrinsic VMT benefits included in the Project Design Features based on its type and location are accounted for with two LUT-series reductions totaling 5% off of the overall Project VMT. An additional three (3) TDM program strategies are proposed as mitigation measures by the applicant that reduce the Project's commute VMT, which is a subset of the overall VMT totaling 33.6%.

When combined, the total scaled reduction of 10.29% is greater than the 7.54% reduction needed to effectively mitigate the significant VMT impact. The reduced Project VMT result is 18.57 VMT per capita, which is less than the significance threshold of 19.14 VMT per capita. **Table 6-1** summarizes the results.

TABLE 6-1
PROJECT VMT REDUCTION STRATEGIES RESULTS

Reduction Measure	Range of Effectiveness	VMT Reduction	Categorical VMT Reduction	Total VMT Reduction	Mitigated Project VMT/Capita	Threshold of Significance (VMT/Capita)	Impact Fully Mitigated?
Project Design Features				10.29%	18.57	19.14	Yes
LUT-3: Increase Diversity of Urban and Suburban Developments (Mixed-Use) (overall VMT)	9.0-30.0%	15.42%	5.0%				
LUT-6: Integrate Affordable and Below Market Rate Housing (overall VMT)	0.04-1.20%	0.60%					
Mitigation Measures							
TRT-3: Provide Ride Sharing Programs (commute VMT)	1.0-15.0%	1.68%	5.57%				
TRT-4: Implement Subsidized or Discounted Transit Programs (commute VMT)	0.3-20.0%	2.65%					
TRT-7: Implement Commute Trip Reduction Marketing (commute VMT)	0.8-4.0%	1.34%					

General Notes:

- Results based on methodology from *Quantifying Green House Gas Mitigation Measures* (CAPCOA – 2010)
- LUT-series capped at 5% for suburban context.
- TRT-series measures apply to commute VMT, which is 33.6% of the overall Project VMT.
- The Project's total VMT Reduction is 10.29%. Each VMT reduction measure's percent reduction is combined multiplicatively in order to get the Project's total VMT Reduction. As discussed in Chapter 6 of the CAPCOA report, the equation is as follows:
Combined Total Reduction = $1 - [(1-A) \times (1-B) \times (1-C) \times \dots]$; A,B,C, = each measure's percent reduction

7.0 VMT IMPACTS SUMMARY AND IMPLEMENTATION

7.1 VMT Impact Summary

The Marja Acres mixed-use Project was determined to have a VMT impact based on the results of the regional SANDAG Series 13 Base Year 2012 Travel Demand Model. The Project VMT per capita was determined to be 20.70. The significance threshold of 85% of the City Average VMT per capita is 19.14, resulting in an increase over the threshold by 7.54%.

Based on the City's Draft Guidelines *Appendix D*, five (5) CAPCOA measures were evaluated to address the Project impact. Two (2) measures relate to the Project's intrinsic design and location as Project design features, and three (3) measures related to the applicant's plan to implement TDM measures as mitigation measure to reduce the Project's VMT per capita to greater than 15% below the City Average.

Using the methodology outlined in the published *Quantifying Green House Gas Mitigation Measures* (CAPCOA 2010) and approved by Carlsbad for use in VMT analyses, a reduction of 10.29% is calculated, reducing the Project VMT below the City's threshold of significance and ***thus fully mitigating the Project's impact.***

7.2 Implementation

This Project will be subject to the requirements of the TDM Handbook as a condition of approval. The Project, as required by the handbook, will be subject to monitoring and reporting of all TDM measures presented in the Project's TDM program. The VMT mitigation measures presented in this document will be included in the Project's TDM program for monitoring and reporting. The Transportation Coordinator position will be essential to ensuring effective implementation of the TDM program.

Funding for these mitigation measures will be guaranteed by the development's CC&Rs. It will be provided through a combination of builder contributions and HOA assessments, and administered via the TDM program required of the Project. For the financial incentives, the Project will provide \$66,510 annually for transit and rideshare subsidies in perpetuity.

In order to realize the VMT reduction associated with TRT-4, at least 7.9% of residents will need to participate in the transit subsidy program. The SANDAG model used in the VMT analysis generated 675 residents for the Project site. At \$66,510 annually, approximately 12.5% of all residents would be covered by the transit subsidy. ($\$65/\text{month} \times 12 \text{ months} = \$780/\text{year}$; $\$66,510 / \$780 = 85 \text{ residents}$). Given the 7.9% qualifying ratio actually amounts to 54 residents needing to participate in the transit subsidy program, the proposed funding will exceed the qualifying amount for TRT-4.

TRT-4 identifies a specific dollar amount required by the Project applicant to achieve the 7.9% reduction. TRT-3 does not identify a specific dollar amount associated with the ride-sharing incentive. Based on the subsidized dollar amount of \$66,510 annually exceeding the qualifying 12.5% for TRT-4, the actual 7.9% of the site population using the \$3.25/day under TRT-4 would amount to \$45,630 annually required by TRT-4. Thus, the remaining \$20,880 would be allocated to ride-share incentive programs identified under TRT-3.

The Project applicant will fund the first three (3) years of the subsidy upfront. Payment will be made prior to occupancy of the first market rate unit. The HOA will assess new residents and manage the TDM program in perpetuity, designate a TDM coordinator, and provide annual reports to City.

End of Report