Stanislaus County

DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT
1010 10TH Street, Suite 3400, Modesto, CA 95354
Planning Phone: (209) 525-6330 Fax: (209) 525-5911
Building Phone: (209) 525-6557 Fax: (209) 525-7759

CEQA INITIAL STUDY

Adapted from CEQA Guidelines APPENDIX G Environmental Checklist Form, Final Text, January 1, 2020

1.	**Project title:**	General Plan Amendment, Rezone, and Vesting Tentative Subdivision Map Application No. PLN2021-0040 – Lazares Companies SCH: 2021060171
2.	**Lead agency name and address:**	Stanislaus County 1010 10th Street, Suite 3400 Modesto, CA 95354
3.	**Contact person and phone number:**	Jeremy Ballard, Associate Planner
4.	**Project location:**	3531 and 3549 East Monte Vista Avenue, between North Waring and Lester Roads, in the Community of Denair. APN: 024-012-009.
5.	**Project sponsor's name and address:**	David Lazares dba Lazares Companies 16795 Lark Avenue, Suite 106 Los Gatos, CA 95302
6.	**General Plan designation:**	Low-Density Residential
7.	**Community Plan designation:**	Estate Residential
8.	**Zoning:**	Rural Residential (R-A)

9. Description of project:

Request to amend the Denair Community Plan designation from Estate Residential to Low-Density Residential and the zoning designation from Rural Residential (R-A) to Planned Development (P-D) on an 18.6± acre parcel, and to subdivide the project site into 72 parcels, with lots ranging in size from 7,223 to 14,962 square feet, to allow for low-density residential development. Of the 72 total lots created, 69 will be for the development of single-family dwellings. The remaining three lots will be used as a dual use stormwater basin/park and two landscaped stormwater swales.

An amendment of the Denair Community Plan to Low-Density Residential is proposed to allow for a higher density of single-family development. The proposed density will be consistent with the existing General Plan Designation of Low-Density Residential. The proposed Planned Development zoning district will include all uses and development standards permitted in the R-1 zoning district with the exception of lot coverage. The applicant has proposed the resulting parcels to be permitted to develop building space of up to 50% of the total lot size, an increase of 10% from the current R-A zoning district. The applicant has requested this to achieve a greater flexibility in siting the housing product offered. The proposed lots will be served by the Denair Community Service District (CSD) for public water and sewer services.

The project site fronts East Monte Vista Avenue and proposes to develop interior residential streets for the development. The frontage along East Monte Vista Avenue and each interior street will be developed with curb, gutter, and sidewalk. The sidewalks will also be developed with street lighting at various points throughout the development. The East Monte Vista Avenue intersection will serve as the main entry into the development by proposing completion of East Monte Vista Avenue by dedicating 55 feet of right-of-way north of the centerline of the road; installing a 29-foot paved lane, and matching curb, gutter, and sidewalk along East Monte Vista Avenue. The applicant has proposed a stub out near the northwest boundary of the project site, to provide connectivity for any future residential development on the two adjacent parcels designated as Estate Residential in the Denair Community Plan.

The applicant proposes to develop a 1.5± acre dual use stormwater basin and park, to be developed on the northeastern boundary of the parcel. The basin will be planted in grass as well as perimeter landscaping consisting of trees, shrubs and groundcover. The northern boundary of the basin park will include a row of evergreen trees and a chain-link fence to act as an agricultural buffer from the adjacent General Agriculture (A-2-10) parcel. Additionally, the applicant proposes to install a meandering sidewalk and benches around the perimeter of the stormwater basin and park. The applicant has proposed two landscaped stormwater swales running east to west along the East Monte Vista Avenue frontage. The swales will be a continuation of the swale developed on the adjacent parcel to the west. The swales will be bordered on the northern end, by a masonry wall with landscaping on the south side of the wall. As part of the overall landscape plan, the applicant has included a tree planting plan for each lot. The tree planting plan will include one single street type tree planted with the development of each home for interior lots, and two street trees to be planted on side yard of corner lots, upon development of the home.

Lastly, the applicant proposes to install sidewalks along the frontage of the adjacent Denair Unified School District, linking to the existing sidewalk that has only been developed on a portion of the parcel and the proposed development.

10.	**Surrounding land uses and setting:**	Mobile Home Park and Single-Family Residential Development to the west, Denair Middle and High School to the east, East Monte Vista Avenue, Church, and orchards to the south, and orchards to the north.
11.	**Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.):**	Stanislaus County Department of Public Works Denair Community Service District
12.	**Attachments:**	1. Air Quality and Greenhouse Gas Technical Report, completed by DeNovo Planning Group, dated May 19, 2022 2. Traffic Impact Assessment, completed by Barrios Traffic Consulting, dated April 29, 2022 3. Updated Can Serve Letter from Denair Community Service District, dated May 12, 2022 4. Geotechnical Investigation, completed by Baez Geotechnical Group, dated April 23, 2021 5. Property Records Search, completed by Central California Information Center, dated March 16, 2021.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:
The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ **Aesthetics**	☐ **Agriculture & Forestry Resources**	☐ **Air Quality**
☐ **Biological Resources**	☐ **Cultural Resources**	☐ **Energy**
☐ **Geology / Soils**	☐ **Greenhouse Gas Emissions**	☐ **Hazards & Hazardous Materials**
☐ **Hydrology / Water Quality**	☐ **Land Use / Planning**	☐ **Mineral Resources**
☐ **Noise**	☐ **Population / Housing**	☐ **Public Services**
☐ **Recreation**	☒ **Transportation**	☐ **Tribal Cultural Resources**
☐ **Utilities / Service Systems**	☐ **Wildfire**	☐ **Mandatory Findings of Significance**

DETERMINATION: (To be completed by the Lead Agency)
On the basis of this initial evaluation:

☐ **I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.**

☒ **I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.**

☐ **I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.**

☐ **I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.**

☐ **I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.**

Signature on file.	**May 25, 2022**
Prepared by Jeremy Ballard	Date

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, than the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses," may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration.

Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

a) Earlier Analysis Used. Identify and state where they are available for review.

b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). References to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

a) the significant criteria or threshold, if any, used to evaluate each question; and

b) the mitigation measure identified, if any, to reduce the impact to less than significant.

ISSUES

I. AESTHETICS – Except as provided in Public Resources Code Section 21099, could the project:	Potentially Significant Impact	Less Than Significant With Mitigation Included	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?			X	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?			X	
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?			X	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			X	

Discussion: The site is not considered to be a scenic resource or a unique scenic vista. Community standards generally do not dictate the need or desire for architectural review of agricultural or residential subdivisions. The proposed project will subdivide an 18.6 ± acre parcel into 72 total lots, for development of a residential subdivision. Of the 72 total lots created, 69 will be for the development of single-family dwellings. The remaining three lots will be used as a dual use stormwater basin/park and two landscaped stormwater swales.

The applicant proposes to develop a 1.5± acre dual use stormwater basin and park, to be developed on the northeastern boundary of the parcel. The basin will be planted in grass as well as perimeter landscaping consisting of trees, shrubs and groundcover. The northern boundary of the basin park will include a row of evergreen trees and a chain-link fence to act as an agricultural buffer from the adjacent General Agriculture (A-2-10) parcel. Additionally, the applicant proposes to install a meandering sidewalk and benches around the perimeter of the stormwater basin and park. The applicant has proposed two landscaped stormwater swales running east to west along the East Monte Vista Avenue frontage. The swales will be a continuation of the swale developed along the frontage of the adjacent parcel to the west. The swales will be bordered on the northern end, by a masonry wall with landscaping on the south side of the wall. The landscaping along the swales will include trees, shrubs, plants and no-mow grasses. As part of the overall landscape plan, the applicant has included a tree planting plan for each lot. The tree planting plan will include one single street type tree planted with the development of each home for interior lots, and two street trees to be planted on side yard of corner lots, upon development of the home. Each individual lot will be landscaped independently during the development phase and will be subject to the requirements of the Model Water Efficiency Landscape Ordinance (MWELO) at the time of building permit submittal.

The site is surrounded by a mobile home park and a residential subdivision to the west, an orchard to the north, the Denair High School to the east, and a church and various agricultural production to the south. The proposed residential development would be of similar character to the residential development to the west of the project site and throughout the Community of Denair.

The project also proposes to install 12 street lights at various locations throughout the subdivision. Public Works' standards and specifications require lighting to be designed to reduce impacts of glare. Any street lighting will be required to meet Public Works' standards and specifications as part of the improvement plans prior to acceptance of the improvement plans. A referral response was received from the Stanislaus County Department of Public Works, it stated that the project will be required to annex into the existing Hideaway Terrace Community Service District and the Denair Highway Lighting District for maintenance funding of the project's lighting, landscaping and fencing.

The project is not expected to degrade any existing visual character of the site or surrounding area, therefore, the project is not anticipated to result in any significant impacts to aesthetics.

Mitigation: None.

References: Application information; Vesting Map; Referral Response from the Stanislaus County Department of Public Works, dated May 26, 2022; Stanislaus County Zoning Ordinance; the Stanislaus County General Plan; and Support Documentation[1].

II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?			**X**	
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?			**X**	
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?			**X**	
d) Result in the loss of forest land or conversion of forest land to non-forest use?			**X**	
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?			**X**	

Discussion: The project site is 18.6± acres in size and is improved with two single-family dwellings, and an agricultural storage building and is planted in almonds. The project site has soils classified by The California Department of Conservation Farmland Mapping and Monitoring Program as "Prime Farmland". The United States Department of Agriculture (USDA) Natural Resources Conservation Service's (NRCS) Eastern Stanislaus County Soil Survey, shows that the dominant soils present are Hanford sandy loam, 0 to 3 percent slopes, and grade one with a Storie Index rating of 30, and Dinuba sandy loam, 0 to 1 percent slopes and grade one with a Storie Index of 95. A Storie Index rating from 80-100 and Grade I and II are considered to be prime farmland; however, this site is zoned Rural Residential with a General Plan and Community Plan designation of Low-Density Residential and Estate Residential. Because the site has already been planned for residential uses, the proposed project will not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use.

All new or expanding uses approved by discretionary permit in the A-2 zoning district or on a parcel adjoining the A-2 zoning district are required to incorporate a minimum 150-foot-wide agricultural buffer setback, or 300-foot-wide buffer setback for people intensive uses. Public roadways, utilities, drainage facilities, rivers and adjacent riparian areas, landscaping, parking lots, and similar low people intensive uses are permitted uses within the buffer setback area. A residential subdivision would be considered a people intensive use. The parcel to the north of the project is zoned General Agriculture (A-2-10). The applicant proposes to develop a 1.5± acre dual use stormwater basin and park, to be developed on the northeastern boundary of the parcel. The basin will be planted in grass as well as perimeter landscaping consisting of trees, shrubs and groundcover. Additionally, the applicant proposes to install a meandering sidewalk and benches around the perimeter of the stormwater basin and park. The northern boundary of the basin park will include a row of evergreen trees and a chain-link fence to act as an agricultural buffer from the adjacent General Agriculture (A-2-10) parcel. The County's Agricultural Commissioner was referred the project and has not stated any issues with the proposed agricultural buffer.

Surrounding uses include a mobile home park and a residential subdivision to the west, the Denair Middle and High Schools to the east, and agricultural producing parcels to the north. The project site currently receives the irrigated water from Turlock Irrigation District (TID) by way of a 36-inch pipeline that begins about 350 feet to the north on East Monte Vista Avenue running east to west. The pipeline also traverses north to south approximately 90 feet from the project sites western property line, benefiting the mobile home park adjacent to the project site for storm drainage into TID facilities. The pipeline then crosses East Monte Vista Avenue for downline users. According to the referral letter received from the Turlock Irrigation District the pipeline is required to be relocated and a new easement centered on the pipeline, to allow continued use by adjacent parcels. The easement will be required to be 25 feet wide or 15 feet wide, located within a public utility easement (PUE). All improvement plans to relocate the pipeline will be required to be reviewed and approved by the District, prior to any work being done. Lastly, the District stated to prevent irrigation water from adjacent parcels reaching non-irrigated parcels, finished grading of the site would be required to be 6 inches higher than adjacent irrigated ground and the proposed stubbed road at the northwest portion of the project site will be required to be 12 inches higher. In response to TID's referral response, the applicant amended their map to account for relocation of the pipeline. The development of the parcel will relocate the irrigation portion, of the 36-inch pipeline westward, through proposed Parcels 4 and 5, creating a 25-foot-wide easement, 20 feet located on proposed Parcel 5's southern boundary and a 5-foot-wide easement on proposed Parcel 4's northern boundary. The pipeline will then run southerly, along the western frontages of proposed Parcels 4, 3, 2, and 1, establishing a 15-foot-wide easement across each proposed parcel. The pipeline will then travel southwest through the proposed swales along East Monte Vista, connecting back into the existing 36-inch pipeline and pressurized manhole at the southwestern portion of the project site. The portion of the pipeline for storm drainage of the adjacent mobile home park to the west of the project site, will be replaced with a 6' inch force main storm drainage pipeline, and will run southerly along the western boundaries of proposed Parcels 28 through 36, terminating into the same pressurized manhole as the irrigation pipeline within the proposed stormwater swale. Each of the affected, proposed parcels will include a 10-foot-wide easement centered on the pipeline. Development Standards will be added to the project to ensure TID's requirements are met.

As stated previously, the nearest agriculturally zoned parcels abut the site to the north and are currently in production. However, these parcels have been included into the Denair Community Plan; designated as Estate Residential and expected to develop at some point in the future. Additionally, the applicant proposes to develop an agriculture buffer at the interface between residential and agricultural by installing a row of evergreen trees and a chain-link fence in addition to the perimeter landscaping for the basin. The nearest agriculturally zoned parcels under a Williamson Act Contract are located approximately 700 feet the northeast of the site. However, the parcels under contract are not located within the Denair Community Plan and are separated from the project site by Waring Road and a mobile home park. Therefore, if approved, the proposed project will not convert farmland to non-agriculture uses as the project site and surrounding area is built-out with residential uses; nor will it conflict with existing zoning or a Williamson Act Contract.

The project site is considered an in-fill development and will not contribute to the loss of farmland or forest land.

Mitigation: **None**

References: Application Materials; California State Department of Conservation Farmland Mapping and Monitoring Program - Stanislaus County Farmland 2018; USDA – NRCS Web Soil Survey; Referral response from Turlock Irrigation District, dated June 22, 2021; Stanislaus County Zoning Ordinance (Title 21); Stanislaus County General Plan and Support Documentation[1].

III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Conflict with or obstruct implementation of the applicable air quality plan?			**X**	

b) 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?			**X**	
c) Expose sensitive receptors to substantial pollutant concentrations?			**X**	
d) Result in other emissions (such as those odors adversely affecting a substantial number of people?			**X**	

Discussion: The proposed project is located within the San Joaquin Valley Air Basin (SJVAB) and, therefore, falls under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). In conjunction with the Stanislaus Council of Governments (StanCOG), the SJVAPCD is responsible for formulating and implementing air pollution control strategies. The SJVAPCD's most recent air quality plans are the 2007 PM10 (respirable particulate matter) Maintenance Plan, the 2008 PM2.5 (fine particulate matter) Plan, and the 2007 Ozone Plan. These plans establish a comprehensive air pollution control program leading to the attainment of state and federal air quality standards in the SJVAB, which has been classified as "extreme non-attainment" for ozone, "attainment" for respirable particulate matter (PM-10), and "non-attainment" for PM 2.5, as defined by the Federal Clean Air Act.

The primary source of air pollutants generated by this project would be classified as being generated from "mobile" sources. Mobile sources would generally include dust from roads, farming, and automobile exhausts. Mobile sources are generally regulated by the Air Resources Board of the California EPA which sets emissions for vehicles and acts on issues regarding cleaner burning fuels and alternative fuel technologies. As such, the District has addressed most criteria air pollutants through basin wide programs and policies to prevent cumulative deterioration of air quality within the Basin. The project will increase traffic in the area and, thereby, impacting air quality.

The proposed project will subdivide an 18.6 ± acre parcel into 72 total lots, for development of a residential subdivision. Of the 72 total lots created, 69 will be for the development of single-family dwellings. The remaining three lots will be used as a dual use stormwater basin/park and two landscaped stormwater swales.

A referral response received from the SJVAPCD stated that emissions generated by the proposed project should be studied further via a California Emission Estimator Model (CalEEMod) analysis and a Health Risk Assessment. Additionally, the District requested that an Ambient Air Quality Analysis (AAQA) be included if any emission of any pollutant exceeds 100 pounds per day. Lastly, the District stated that the project may be subject to additional District Rules and that an Authority to Construct, or an Air Impact Assessment may be required prior to commencement of project development.

An Air Quality and Greenhouse Gas Technical Report was prepared by the De Novo Planning Group on May 19, 2022. The report utilized the 2020.4.0 version of CalEEMod for analysis, which focused on criteria pollutants such as: Ozone (O3/ROG); Particulate Matter10 (PM10); Particulate Matter 2.5 (PM2.5); Carbon Monoxide (CO); Nitrogen Oxides (NO); Sulfur Dioxide (SO2); Sulfates; Lead, Hydrogen Sulfide; Tanner Air Toxics (TACs) and Visibility Reducing Particles. In addition, the analysis included the projects impacts to Greenhouse Gases, Climate Change, and Energy.

In relation to air emissions, the analysis found that the proposed project would not result in a considerable net increase of any criteria pollutant for which the project's region is in non-attainment, or conflict with the District's air quality plan. The analysis included both unmitigated or mitigated operational emissions (full buildout of the proposed subdivision) and found that criteria pollutant emissions for the project would not exceed SJVAPCD thresholds (Attachment 2 - Tables 2-6 and 2-7). To note, the term mitigated in the analysis is not related to any recommended mitigation measures, rather for project design features such as: walkability design; proximity to nearest job centers; development of pedestrian network within the project site; use of traffic calming measures; busing for school age children; removal of hearths from residential development plans; 3% of landscape equipment utilized is electrically powered; and installation of solar panels on dwellings as required by State law. The analysis found the proposed project's operational criteria pollutant emissions would be anticipated to have a less than significant impact. Subsequently, the project found that construction activities of the proposed project would also not exceed SJVAPCD criteria pollutants thresholds (Attachment 2 - Table 2-8). Additionally, the analysis stated the project would incorporate SJVAPCD best practices from construction management to further reduce any criteria pollutant. The analysis found the project emissions from construction activities associated with development of the residential subdivision related to criteria pollutant emissions would have a less than significant impact.

The Health Risk Assessment part of the analysis focused on generation of pollutants such a carbon monoxide or TACs, that includes pollutants such as: acrolein; benzene; 1,3-butidiene; diesel particulate matter; formaldehyde; naphthalene; and polycyclic organic matter.

The analysis stated that the project site is located within an area of State attainment and a federal attainment-unclassified area for carbon monoxide. Similar to other pollutants, the main source for carbon monoxide in cases of residential projects are mobile sources. Subsequently, the analysis found that the operational level of the project (full residential development buildout) would fall below any SJVAPCD thresholds for carbon monoxide, as the project is not anticipated to be a significant generator of carbon monoxide nor would the project be designed in a way that would trap or retain carbon monoxide generated offsite from the local road network.

The analysis indicates, that the majority of these TAC pollutants come from mobile sources that produce exhaust containing these emissions with non-mobile sources generally coming from commercial or industrial development. Table 2-9 of the analysis includes a list of the California Air Resources Boards (CARB) minimum separation recommendations on siting sensitive land uses. The proposed project is not located in the vicinity of any of the source categories such as: freeways or high traffic roads that produce over 50,000 vehicle trips per day; distribution centers; rail yards; ports; refineries; chrome platers; or dry cleaners. The analysis found the proposed projects development of a residential subdivision would not be a significant generator of TACs. Therefore, the analysis found the proposed project would not demonstrate a significant health risk for any sensitive receptors within the project site or in the vicinity of the project.

Lastly, the analysis looked at whether the project would generate any objectionable odors that could be generated by the proposed project or place sensitive receptors in proximity to odor sources. As residential subdivisions are not common sources of objectionable odors and the proposed project is not in the vicinity of any primary sources of odor, such as: wastewater treatment facilities; chemical manufacturing; landfills; fiberglass manufacturing; waste transfer stations; composting facilities; food processing lots; rendering plants; or similar facilities, the project will have a less than significant impact on generation or siting of sensitive receptors for objectionable odors. Although, adjacent to farmable land, to the north, the County has a right to farm ordinance that exempts odors emanating from traditional farming practices. A development standard will require noticing of the right to farm ordinance to all prospective buyers of future residential lots.

The SJVAPCD reviewed the Air Quality and Greenhouse Gas Technical Report and confirmed the report's findings that no project specific annual criteria pollutant emissions from construction and operation are expected to exceed any significant thresholds. Additionally, the SJVAPCD confirmed that the project will also not have a significant impact on public health. The District also stated that the project was subject to District Rule 9510 and will be required to obtain an Air Impact Assessment prior to the issuance of the first project building permit. A development standard will be added to the project to address this prior to issuance of any grading or building permit.

Based on the entirety of the Air Quality and Greenhouse Gas Technical Report performed by De Novo Planning Group and the response from the SJVAPCD, the proposed project is expected to have a less than significant impact on air quality.

Mitigation: None.

References: San Joaquin Valley Air Pollution Control District - Regulation VIII Fugitive Dust/PM-10 Synopsis; www.valleyair.org; Referral Response from the San Joaquin Valley Air Pollution Control District, dated June 23, 2021; Referral Response from the San Joaquin Valley Air Pollution Control District, dated May 12, 2022; Air Quality and Greenhouse Gas Technical Report, prepared by the De Novo Planning Group on May 19, 2022; and the Stanislaus County General Plan and Support Documentation[1].

IV. BIOLOGICAL RESOURCES -- Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Included	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?			X	
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?			X	

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			**X**	
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			**X**	
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?			**X**	
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?			**X**	

Discussion: The project is located within the Denair Quad of the California Natural Diversity Database based on the U.S. Geographical quadrangle map series. According to aerial imagery and application materials, the surrounding area is adjacent to a school, a mobile home park, and other residential development.

Based on results from the California Natural Diversity Database (CNDDB), there are three animals, one insect and one plant species, which are state or federally listed, threatened, or identified as species of special concern or a candidate of special concern within the Denair California Natural Diversity Database Quad. These species include the Swainson's hawk, steelhead – Central Valley DPS, valley elderberry longhorn beetle and San Joaquin Valley Orcutt grass. There is a very low likelihood that these species are present on the project site. The project site has been planted in orchard for a considerable amount of time and is adjacent to urban development. Additionally, the CNDDB did not indicate previous sightings of these species within the project vicinity.

The project will not conflict with a Habitat Conservation Plan, a Natural Community Conservation Plan, or other locally approved conservation plans. Impacts to endangered species or habitats, locally designated species, or wildlife dispersal or mitigation corridors are considered to be less than significant.

An Early Consultation was referred to the California Department of Fish and Wildlife (formerly the Department of Fish and Game) and no response was received.

Mitigation: None.

References: California Department of Fish and Wildlife's Natural Diversity Database Quad Species List; Stanislaus County General Plan and Support Documentation[1].

V. CULTURAL RESOURCES -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Cause a substantial adverse change in the significance of a historical resource pursuant to in § 15064.5?			**X**	
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?			**X**	
c) Disturb any human remains, including those interred outside of formal cemeteries?			**X**	

Discussion: A records search for the project site formulated by the Central California Information Center (CCIC) indicated that there was a low probability of discovery of prehistoric resources, but there may be discovery of historical resources as it is possible the project will impact existing structures that are over 45 years old, and possibly subsurface historic-era refuse and artifact under the surface which may be found during excavation and trenching. No records were found that indicated the site contained prehistoric or archeologic resources previously identified onsite. While the existing structures onsite will be demolished as part of the site development, the County does not use age as an indication of historic resources. The barn on the project site is not federally or state registered as a historic structure and is not located within a historic zoning district. Accordingly, the demolition of these structures is not considered a significant impact to cultural resources.

The project was referred to tribal governments listed with the Native American Heritage Commission (NAHC), as required by SB 18, and no responses have been received to date. Stanislaus County has not received any requests for consultation, in accordance with AB 52. A development standard regarding the discovery of cultural resources during the construction process will be added to the project.

Mitigation: None.

References: Central California Information Center Report for the project site, March 16, 2021; Stanislaus County General Plan and Support Documentation[1]; Stanislaus County General Plan and Support Documentation[1].

VI. ENERGY -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?			X	
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?			X	

Discussion: The CEQA Guidelines Appendix F states that energy consuming equipment and processes, which will be used during construction or operation such as: energy requirements of the project by fuel type and end use, energy conservation equipment and design features, energy supplies that would serve the project, total estimated daily vehicle trips to be generated by the project, and the additional energy consumed per trip by mode, shall be taken into consideration when evaluating energy impacts. Additionally, the project's compliance with applicable state or local energy legislation, policies, and standards must be considered.

The proposed project will subdivide an 18.6 ± acre parcel into 72 total lots, for development of a residential subdivision. Of the 72 total lots created, 69 will be for development of single-family dwellings. The remaining three lots will be used as a dual use stormwater basin/park and two landscaped stormwater swales.

The project also proposes to install 12 street lights at various locations throughout the subdivision. Any street lighting will be required to meet Public Works' standards and specifications as part of the improvement plans prior to acceptance of the improvement plans. A referral response was received from the Stanislaus County Department of Public Works stated that the project will be required to annex into the existing Hideaway Terrace Community Service District and the Denair Highway Lighting District for maintenance funding of the project's lighting, landscaping and fencing.

A referral response received from TID indicated that any existing TID infrastructure that must be relocated or upgraded as a result of the project shall be approved by TID and completed at the developer's expense. A development standard will be added to the project to reflect TID's requirement.

As part of an analysis of Air Quality and Greenhouse Gases, a technical report was prepared by the De Novo Planning Group on May 19, 2022. The report utilized the 2020.4.0 version of CalEEMod for analysis, which focused on criteria pollutants such as: Ozone (O3/ROG); Particulate Matter10 (PM10); Particulate Matter 2.5 (PM2.5); Carbon Monoxide (CO); Nitrogen Oxides (NO); Sulfur Dioxide (SO2); Sulfates; Lead, Hydrogen Sulfide; Tanner Air Toxics (TACs) and Visibility Reducing Particles. In addition, the analysis included the projects impacts to Greenhouse Gases, Climate Change, and Energy. Additionally, the analysis relied on a VMT analysis performed as part of a Traffic Impact Analysis completed for the project by Barrios Transportation Consulting, dated April 29, 2022

The Energy section of the report, analyzed potential energy requirements, inefficiencies, and intensiveness from materials used from the project buildout of single-family dwellings including outdoor lighting, generation of vehicle trips from construction and operational (full buildout) activities, and project maintenance. The analysis found that the proposed project would be in compliance with all applicable federal, state, and local regulations-based reduction of per capital energy consumption requirements by the appropriate entities. The proposed project would be served by TID for electrical services. The District has implemented diversification of its energy portfolio, achieving a 33% mixture of renewal energy resources in 2020 and is on track to achieve 60% by 2030. The analysis also assumed other statewide measures intended to improve energy efficiency of statewide passenger and heavy-duty truck fleet vehicles, which would improve fuel economies, accruing over time. Additionally, the construction of each single-family dwelling, as a result of project development, would be required to meet Title 24, of the California Green Building Code, which will ensure energy efficiency.

Based on the report, it does not appear this project will result in significant impacts to the wasteful, inefficient, or unnecessary consumption of energy resources. A condition of approval will be added to this project to address compliance with Title 24, Green Building Code, for projects that require energy efficiency.

Mitigation: None.

References: Application Materials; CEQA Guidelines; Title 16 of County Code; CA Building Code; Stanislaus County Standards and Specifications; Referral response from Turlock Irrigation District, dated June 22, 2021; Referral Response from the Stanislaus County Department of Public Works, dated May 26, 2022; Air Quality and Greenhouse Gas Technical Report, prepared by the De Novo Planning Group on May 19, 2022; Transportation Impact Assessment prepared by Barrios Transportation Consultant, dated April 29, 2022; Stanislaus County 2016 General Plan EIR; Stanislaus County General Plan and Support Documentation[1].

VII. GEOLOGY AND SOILS -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:			X	
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			X	
ii) Strong seismic ground shaking?			X	
iii) Seismic-related ground failure, including liquefaction?			X	
iv) Landslides?			X	
b) Result in substantial soil erosion or the loss of topsoil?			X	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			X	
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?			X	
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?			X	

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			**X**	

Discussion: The USDA Natural Resources Conservation Service's Eastern Stanislaus County Soil Survey indicates that the property is made up of Hanford sandy loam soils (HdA). As contained in Chapter 5 of the General Plan Support Documentation, the areas of the County subject to significant geologic hazard are located in the Diablo Range, west of Interstate 5; however, as per the California Building Code, all of Stanislaus County is located within a geologic hazard zone (Seismic Design Category D, E, or F) and a soils test may be required at building permit application. DER, Public Works, and the Building Permits Division review and approve any building permit to ensure their standards are met.

The proposed project will subdivide an 18.6 ± acre parcel into 72 total lots, for development of a residential subdivision. The project site fronts East Monte Vista Avenue and proposes to develop interior residential streets for the development. The frontage along East Monte Vista Avenue and each interior street will be developed with curb, gutter, and sidewalk. The sidewalks will also be developed with street lighting at various points throughout the development. The East Monte Vista Avenue intersection will serve as the main entry into the development, however, the applicant has proposed a stub out near the northwest boundary of the project site, to provide connectivity for any future residential development on the two adjacent parcels designated as Estate Residential in the Denair Community Plan.

The applicant proposes to develop a 1.5± acre dual use stormwater basin and park, to be developed on the northeastern boundary of the parcel. The basin will be planted in grass as well as perimeter landscaping consisting of trees, shrubs and groundcover. The northern boundary of the basin park will include a row of evergreen trees and a chain-link fence to act as an agricultural buffer from the adjacent General Agriculture (A-2-10) parcel. Additionally, the applicant proposes to install a meandering sidewalk and benches around the perimeter of the stormwater basin and park. The applicant has proposed two landscaped stormwater swales running east to west along the East Monte Vista Avenue frontage. The swales will be a continuation of the swale developed on the adjacent parcel to the west. The swales will be bordered on the northern end, by a masonry wall with landscaping on the south side of the wall.

Any earth moving must be approved by Public Works as complying with adopted Standards and Specifications, which consider the potential for erosion and run-off prior to permit approval. A geotechnical report was submitted as part of the project, which was completed by Baez Geotechnical Group on April 23, 2021. The report found that the soil onsite would be suitable for residential development and recommended that a minimum of 3 feet of engineered fill be included in each building pad. The report also included general recommendations for site preparation and grading. The project was referred to Public Works who responded that prior to the recording of the final map, a complete set of improvement plans that are consistent with the Stanislaus County Standards and Specifications and the tentative map shall be submitted and approved by Stanislaus County Public Works; additionally, a current soils report for the area to be subdivided and a grading, drainage, and erosion/sediment control plan shall be submitted prior to acceptance of the improvement plans. Public Works' requirements will be placed on the project as development standards.

The Building Division may utilize the results from the soils test, or require additional soils tests, to determine if unstable or expansive soils are present. If such soils are present, special engineering of any structures will be required to compensate for the soil deficiency. Any structures resulting from this project will be required to be designed and built according to building standards appropriate to withstand shaking for the area in which they are constructed.

The resulting dwellings will be served public water and sewer by the Denair Community Services District (CSD). The Denair CSD provided a letter indicating their ability to serve the project site with public water and sewer. The letter indicated that the CSD will require the owner/developer to enter into an Agreement with the Denair CSD to construct and pay for necessary infrastructure to enable the District to provide water and sewer services to the project. The Agreement will require the infrastructure be constructed to District specifications, and that security be given to the District to guarantee performance and payment for the infrastructure, and that all current connection fees be paid in full prior to issuance of a formal Will-Serve letter to the property owner/developer. The Will-Serve letter must be presented to the Stanislaus County Building Permits Division prior to issuance of a building permit for any residential structure. As part of the site development for the project, the existing domestic well will be demolished. No septic tanks are proposed as part of the project request; however, existing septic tanks will be removed from the site as project development. A referral response was received from the Department of Environmental Resources requiring the development obtain a formal Will-Serve letter from the Denair Community Services District for sewer and water and that the applicant receive all necessary permits for removal of the existing septic tanks. Development Standards will be added to the project to address these requirements.

The project site is not located near an active fault or within a high earthquake zone. Landslides are not likely due to the flat terrain of the area. Compliance with the Storm Water Pollution Prevention Program (SWPPP), with the Alquist-Priolo Earthquake Fault Zoning Act, and the California Building Code are all required through the building and grading permit review process which would reduce the risk of loss, injury, or death due to earthquake or soil erosion to less than significant.

Mitigation: None.

References: USDA – NRCS Web Soil Survey; Geotechnical Investigation, completed by Baez Geotechnical Group, dated April 23, 2021; Referral Response from the Stanislaus County Department of Public Works, dated May 26, 2022; Referral Response from the Stanislaus County Department of Environmental Resources, dated May 17, 2022; Stanislaus County General Plan and Support Documentation[1].

VIII. GREENHOUSE GAS EMISSIONS -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			X	

Discussion: The principal Greenhouse Gasses (GHGs) are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and water vapor (H2O). CO2 is the reference gas for climate change because it is the predominant greenhouse gas emitted. To account for the varying warming potential of different GHGs, GHG emissions are often quantified and reported as CO2 equivalents (CO2e). In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill [AB] No. 32), which requires the California Air Resources Board (ARB) design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020. Two additional bills, SB 350 and SB32, were passed in 2015 further amending the states Renewables Portfolio Standard (RPS) for electrical generation and amending the reduction targets to 40% of 1990 levels by 2030.

The proposed project will subdivide an 18.6 ± acre parcel into 72 total lots, for development of a residential subdivision. Of the 72 total lots created, 69 will be for the development of single-family dwellings. The remaining three lots will be used as a dual use stormwater basin/park and two landscaped stormwater swales.

As stated in Section III – Air Quality of this report, the SJVAPCD requested additional studies related to potential emissions from development of the proposed project. An Air Quality and Greenhouse Gas Technical Report was prepared by the De Novo Planning Group on May 19, 2022. The report utilized the 2020.4.0 version of CalEEMod for analysis, which focused on criteria pollutants such as: Ozone (O3/ROG); Particulate Matter10 (PM10); Particulate Matter 2.5 (PM2.5); Carbon Monoxide (CO); Nitrogen Oxides (NO); Sulfur Dioxide (SO2); Sulfates; Lead, Hydrogen Sulfide; Tanner Air Toxics (TACs) and Visibility Reducing Particles. In addition, the analysis included the projects impacts to Greenhouse Gases, Climate Change, and Energy. Additionally, the analysis relied on a Vehicle Miles Traveled (VMT) analysis performed as part of a Traffic Impact Analysis completed for the project by Barrios Transportation Consulting, dated April 29, 2022.

The analysis looked at the various state legislative action over the years and all relevant judicial proceedings to form a per capita emissions threshold for projects in California. The per capita threshold for the year of 2023, the year of anticipated project construction and development, was established in the analysis, as 4.02 MT CO_2e (Metric Tons of Carbon Dioxide)/service population/year. This threshold was used to analyze the proposed project. The analysis looked at both potential construction related GHG and operational (full buildout) related GHG. Ultimately, the analysis found that while there would be increases in GHG in the short-term situation with construction activities and in the long term with the full build out of the subdivision, neither would exceed the per capita 4.02 MTCO2e threshold developed for the analysis. Without exceedance of that per capita threshold, the analysis found that the project is not anticipated to generate GHG either directly or indirectly, conflict with any applicable plan, policy, or regulation for the purpose of reducing GHG, at a level that would exceed the less than significant threshold.

As mobile sources can be a generator of GHG, an analysis of a project's VMT can assess the projects potential impacts. As required by CEQA Guidelines Section 15064.3, potential impacts to transportation should be evaluated using Vehicle

Miles Traveled (VMT). Stanislaus County has currently not adopted any significance thresholds for VMT, and projects are treated on a case-by case basis for evaluation under CEQA. However, the State of California - Office of Planning and Research (OPR) has issued guidelines regarding VMT significance under CEQA. The CEQA Guidelines identify vehicle miles traveled (VMT), which is the amount and distance of automobile travel attributable to a project, as the most appropriate measure of transportation impacts. According to the same technical advisory from OPR, projects that generate or attract fewer than 110 trips per-day generally or achieves a 15% reduction of VMT may be assumed to cause a less-than significant transportation impact.

A Traffic Impact Assessment performed by the Barrios Transportation Consulting group included an analysis of VMT for the proposed project. The VMT analysis compiled a VMT baseline for the Community of Denair utilizing the Three County Travel Demand Forecasting model developed by the County. This included utilizing 2019/2020 Average Daily Travel Conditions of all residential dwellings in Denair, and dividing by the total number of single-family dwellings within Denair, for a VMT of 197.3 miles traveled per household. The analysis found that the average trip length to be 20.9 miles per trip. The 2045 cumulative (full buildout) conditions for the Community of Denair; VMT was determined to be 196.4 miles traveled per household, which was a .9-mile VMT reduction per household under the cumulative scenario. The VMT analysis portion of the assessment, found that based on the project location near the western boundary of the community of Denair, the average project trip length would be 20.1 miles per trip, which would lower the baseline VMT of the project to 189.7 miles traveled per household, a reduction of 3.8% from the cumulative baseline. Additionally, the analysis found that the proposed project's improvement of connective sidewalk between the project site and the adjacent Denair High School would account for two less vehicle trips per day, which would equate to 175.6 vehicle miles traveled per household for the project, a 7.4% VMT reduction from the cumulate baseline scenario. In total, the project would reduce VMT a total of 11% than the 2045 cumulative conditions.

Although the project does not meet OPR's technical guideline, which identifies a 15% reduction in VMT, the project is considered an infill residential project, as the project site was already identified in the Denair Community Plan for residential uses, which was accounted for under previous environmental analysis. Accordingly, VMT impacts are considered to be less than significant.

Mitigation: None.

References: Referral Response from the San Joaquin Valley Air Pollution Control District, dated June 23, 2021; Air Quality and Greenhouse Gas Technical Report, prepared by the De Novo Planning Group on May 19, 2022; Stanislaus County General Plan and Support Documentation[1].

IX. HAZARDS AND HAZARDOUS MATERIALS -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			**X**	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			**X**	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			**X**	
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?			**X**	

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?			**X**	
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			**X**	
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?			**X**	

Discussion: The project was referred to the Department of Environmental Resources (DER) Hazardous Materials Division, which is responsible for overseeing hazardous materials. A response was received indicating that the developer shall conduct a Phase I or Phase II study prior to the issuance of a grading permit to determine if organic pesticides or metals exist on the project site. Any existing well or septic facilities are required to be destroyed through a permit issued by DER. Additionally, the Hazardous Materials Division requested that they be contacted should any underground storage tanks, buried chemicals, buried refuse, or contaminated soil be discovered during grading or construction. These comments will be reflected through the application of a development standards.

Pesticide exposure is a risk in areas located in the vicinity of agricultural uses. Sources of exposure include contaminated groundwater, which is consumed and drift from spray applications. Application of sprays are strictly controlled by the Agricultural Commissioner and can only be accomplished after first obtaining permits. The project site is adjacent to agriculturally zoned parcels to the north. However, these parcels are designated as Estate Residential in the Denair Community Plan. To ensure compatibility between the two uses, the applicant has proposed to place the dual use storm water basin adjacent to A-2 zoned property to the north, and will include a row of evergreen trees and a chain-link fence to act as an agricultural buffer on that northern boundary line. The project was referred to the Agricultural Commissioner's **Office; however, no response was received.**

The site is located in a Local Responsibility Area (LRA) for fire protection and is served by Denair Fire Protection District. The project was referred to the District; however, no response has been received to date. Each subsequent building permit for the residential development will be required to meet any relevant State of California Fire Code requirement prior to issuance.

The project site is not listed on the EnviroStor database managed by the CA Department of Toxic Substances Control or within the vicinity of any airport. However, a referral response from the Department of Toxic Substances Control (DTSC) was received and included comments regarding; the potential release of aerially deposited lead (ADL) in and along roadways, removal of chemicals subsequent to the demolition of structures, use of imported soil to backfill, and the use of pesticides. The project will not require the importation of soil to backfill excavated areas, or the removal of the existing roadway. None of these conditions outlined in the referral response are present in the proposed project. Demolition of the existing dwellings will be required to obtain building permits and releases from the San Joaquin Valley Air Pollution Control District.

The groundwater is not known to be contaminated in this area. The project will be served by the Denair Community Services District for their domestic water and sewer services.

The project site is not within the vicinity of any airstrip or wildlands. No significant impacts associated with hazards or hazardous materials are anticipated to occur as a result of the proposed project.

Mitigation: None.

References: Referral Response from the State of California Department of Toxic Substances Control, dated June 14, 2021**;** Stanislaus County Department of Hazardous Materials, dated May 23, 2022; Stanislaus County General Plan and Support Documentation[1].

X. HYDROLOGY AND WATER QUALITY -- Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Included	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?			X	
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?			X	
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:			X	
i) result in substantial erosion or siltation on- or off-site;			X	
ii) substantially increase the rate of amount of surface runoff in a manner which would result in flooding on- or off-site.			X	
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or			X	
iv) impede or redirect flood flows?			X	
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?			X	
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?			X	

Discussion: Areas subject to flooding have been identified in accordance with the Federal Emergency Management Act (FEMA). The project site is located in FEMA Flood Zone X, which includes areas determined to be outside the 0.2% annual chance floodplains. All flood zone requirements are addressed by the Building Permits Division during the building permit process.

The proposed project will subdivide an 18.6 ± acre parcel into 72 total lots, for development of a residential subdivision. Of the 72 total lots created, 69 will be for the development of single-family dwellings. The applicant proposes to develop a 1.5± acre dual use stormwater basin and park, to be developed on the northeastern boundary of the parcel. The basin will be planted in grass as well as perimeter landscaping consisting of trees, shrubs and groundcover. The northern boundary of the basin park will include a row of evergreen trees and a chain-link fence to act as an agricultural buffer from the adjacent General Agriculture (A-2-10) parcel. The applicant has proposed two landscaped stormwater swales running east to west along the East Monte Vista Avenue frontage. The swales will be a continuation of the swale developed on the adjacent parcel to the west. The swales will be bordered on the northern end, by a masonry wall with landscaping on the south side of the wall.

Any earth moving must be approved by Public Works as complying with adopted Standards and Specifications, which consider the potential for erosion and run-off prior to permit approval. The project was referred to Public Works who responded that a grading, drainage, and erosion/sediment control plan that includes drainage calculations that verify compliance with the current State of California National Pollutant Discharge Elimination System (NPDES) General Construction Permit shall be submitted prior to acceptance of the improvement plans. Public Works' requirements will be placed on the project as a development standard.

Water quality in Stanislaus County is regulated by the Regional Water Quality Control Board, Central Valley Region, (RWQCB) under a Water Quality Control Plan (Basin Plan) for the Sacramento and San Joaquin River Basins. Under the

Basin Plan, the RWQCB issues Waste Discharge Requirements (WDRs) to regulate discharges with the potential to degrade surface water and/or groundwater quality. In addition, the RWQCB issues orders to cease and desist, conduct water quality investigations, or implement corrective actions. The Stanislaus County Department of Environmental Resources (DER) manages compliance with WDRs for some projects under a Memorandum of Understanding with the RWQCB. The project was referred to RWQCB; however, no response has been received to date. A development standard will be added to the project requiring the applicant contact and coordinate with RWQCB to determine if any permits or Water Board requirements must be obtained/met prior to issuance of a building permit.

The project site currently receives the irrigated water from Turlock Irrigation District (TID) by way of a 36-inch pipeline that begins about 350 feet to the north on East Monte Vista Avenue running east to west. The pipeline also traverses north to south approximately 90 feet from the project sites western property line, benefiting the mobile home park adjacent to the project site for storm drainage into TID facilities. The pipeline then crosses East Monte Vista Avenue for downline users. According to the referral letter received from the Turlock Irrigation District the pipeline is required to be relocated and a new easement centered on the pipeline, to allow continued use by adjacent parcels. The easement will be required to be either 25 feet wide or 15 feet wide, located within a public utility easement (PUE). All improvement plans to relocate the pipeline will be required to be reviewed and approved by the District, prior to any work being done. Lastly, the District stated to prevent irrigation water, from adjacent parcels reaching non-irrigated parcels, finished grading of the site would be required to be 6 inches higher than adjacent irrigated ground and the proposed stubbed road at the northwest portion of the project site will be required to be 12 inches higher. In response to TID's referral response, the applicant amended their map to account for relocation of the pipeline. The development of the parcel will relocate the irrigation portion of the 36-inch pipeline westward, through proposed Parcels 4 and 5, creating a 25-foot-wide easement, 20 feet located on proposed Parcel 5's southern boundary and a 5-foot-wide easement on proposed Parcel 4's northern boundary. The pipeline will then run southerly, along the western frontages of proposed Parcels 4, 3, 2, and 1, establishing a 15-foot-wide easement across each proposed parcel. The pipeline will then travel southwest through the proposed swales along East Monte Vista, connecting back into the existing 36-inch pipeline and pressurized manhole at the southwestern portion of the project site. The portion of the pipeline for storm drainage of the adjacent mobile home park to the west of the project site, will be replaced with a 6' inch force main storm drainage pipeline, and will run southerly along the western boundaries of proposed Parcels 28 through 36, terminating into the same pressurized manhole as the irrigation pipeline within the proposed stormwater swale. Each of the affected proposed parcels will include a 10-foot-wide easement centered on the pipeline. Development Standards will be added to the project to ensure TID's requirements are met.

The project site is located within, and will be served water and sewer services by, the Denair Community Services District (CSD). The Denair CSD provided a letter indicating their ability to serve water and sewer to the project site. As a condition of service, the CSD will require the owner/developer to enter into an Agreement to construct and pay for necessary infrastructure to enable the District to provide water and sewer services to the project. The Agreement will require the infrastructure be constructed to District specifications, that security be given to the District to guarantee performance and payment for the infrastructure, and that all current connection fees be paid in full. Development standards will be added to the project to ensure these requirements are met. A referral response was received from the Department of Environmental Resources requiring the development obtain a formal Will-Serve letter from the Denair Community Services District for sewer and water and that the applicant receive all necessary permits for removal of the existing septic tanks. Development Standards will be added to the project to address these requirements.

A referral response from the City of Turlock was received for the project, stating the project could have a significant impact on the environment due to the amendment of the Community Plan Designation to a higher density designation. The City relayed concerns about additional growth towards the periphery of the Community of Denair, that could affect City facilities. Specifically, the City stated concerns about the proposed development of an additional well within the proposed project boundary, whether its development would have been included in the CSD Water Master Plan and if impacts to groundwater would be included in that document.

Although the project was always intended to be served by the CSD for water and sewer service, the application initially proposed development of a new municipal size well within the residential subdivision to be dedicated to the CSD upon construction. However, after discussions with the CSD, the applicant revised their project to no longer include a well site parcel or development of a well. The CSD has stated they have plans to develop an additional well site for the benefit of the Community of Denair at a different location, however, that well site will be developed in the future by the CSD within the normal processes. The applicant will contribute a fair share amount towards the development of a new well as a part of required connection fees to the CSD.

The project will connect into an existing 12-inch CSD water main located on the adjacent Denair Unified School District parcel (APN: 024-012-020), at the northeastern portion of the project site. The 12-inch main will then be continued through the subdivision, connecting into the existing 12-inch water main along East Monte Vista Avenue. Additionally, the 12-inch water main will be extended westward stubbing out at the northern edge of proposed Street B for future use of the parcels to the north. The water main will be downsized to an 8-inch line as it extends south down proposed Street B and east along proposed Street D. The CSD already serves the residential subdivision and the mobile home park to the west of the project site, which front onto Warning Road.

As stated previously, the proposed project is within Denair CSD district boundary and has been included in the District's service planning. The City's referral response stated a concern with the increased density of the proposed project and if the District had the capacity to serve. However, according to the 2020 LAFCO adopted Municipal Service Review of the Denair Community Service District, the District has the capacity to serve the existing facilities and infrastructure within all areas of the existing district boundary, which the parcel is located within. The CSD has reviewed the proposed project and has stated they have the capacity to serve the infill project. Although, the applicant is requesting a change in the Community Plan of Estate Residential to Low-Density Residential, the sites current General Plan Designation and Zoning Designation of Rural Residential would have permitted a residential subdivision of this size and density. Subsequently, the project site is located within the existing Community Plan boundaries and would be considered infill. Consequently, any addition of District facilities that would alter services would be evaluated by the Local Agency Formation Commission (LAFCO). Therefore, there are no indications that the proposed project would have any significant impacts on groundwater resources, as it would utilize existing CSD facilities for development of the project.

Groundwater management in California is regulated under the 2014 California Sustainable Groundwater Management Act (SGMA), which requires the formation of local Groundwater Sustainability Agencies (GSAs) to oversee the development and implementation of Groundwater Sustainability Plans (GSPs). SGMA defines sustainable groundwater management as the prevention of "undesirable results," including significant and unreasonable chronic groundwater levels, reduction of groundwater storage, degraded water quality, land subsidence, and/or depletions of interconnected surface water. GSPs define minimum thresholds and measurable objectives for sustainable groundwater management, designate monitoring networks to assess compliance with these management criteria and prescribe management actions and projects to achieve sustainability objectives within 20 years of their adoption.

Public and private water agencies and user groups within each of the four groundwater sub basins underlying the County work together as GSAs to implement SGMA. DER is a participating member in five GSAs. GSPs were adopted in January 2020 for the portions of the County underlain by the Eastern San Joaquin and Delta-Mendota Groundwater Sub basins and will be adopted for the Turlock and Modesto Sub basins by January 31, 2022. The subject project is located within the West Turlock Groundwater Sub basin and the jurisdiction of the East Turlock Sub basin GSA, which the CSD would be subject any requirements of the GSP.

Groundwater management in Stanislaus County is also regulated under the County Groundwater Ordinance, adopted in 2014. The Groundwater Ordinance is aligned with SGMA in its objective to prevent "undesirable results". To this end, the Groundwater Ordinance requires that applications for new wells that are not exempt from the Ordinance are accompanied by substantial evidence that operation of the new well will not result in unsustainable groundwater extraction. Further, the owner of any well from which the County reasonably concludes groundwater may be unsustainably withdrawn, is required to provide substantial evidence of sustainable extraction. No new wells are anticipated to be installed as a result of this project. However, if a new well were required in the future by the CSD, the drilling of a new well would be regulated by SIGMA, which would include an environmental analysis consistent with CEQA.

In addition to GSPs and the Groundwater Ordinance, the County General Plan includes goals, policies, and implementation measures focused on protecting groundwater resources. Projects with a potential to affect groundwater recharge or that involve the construction of new wells are referred to the DER for review. The DER evaluates these projects for compliance with the County Groundwater Ordinance and refer projects to the applicable GSAs for determination whether or not they are compliant with an approved GSP.

As a result of the development standards required for this project, impacts associated with drainage, water quality, and runoff are expected to have a less-than-significant impact.

Mitigation: None.

References: Can Serve letter from Denair Community Service District, dated May 12, 2022**;** Referral Response from the City of Turlock, dated August 13, 2021; Referral Response Stanislaus County Department of Public Works, dated May 26, 2022; Referral response from Turlock Irrigation District, dated June 22, 2021; Referral Response from the Stanislaus County

Department of Environmental Resources, dated May 17, 2022; Stanislaus County General Plan and Support Documentation[1].

XI. LAND USE AND PLANNING -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Physically divide an established community?			**X**	
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?			**X**	

Discussion: The project site is designated Low-Density Residential within the County's General Plan, Estate Residential within the Denair Community Plan, and zoned Rural Residential (R-A). The proposed project is to amend the Denair Community Plan designation from Estate Residential to Low-Density Residential and the zoning designation from Rural Residential (R-A) to Planned Development (P-D) on an 18.6± acre parcel, and to subdivide the project site into 72 parcels, with lots ranging in size from 7,223 to 14,962 square feet, to allow for low-density residential development. Of the 72 total lots created, 69 will be for the development of single-family dwellings. The remaining three lots will be used as a dual use stormwater basin/park and two landscaped stormwater swales.

An amendment of the Denair Community Plan to Low-Density Residential is proposed to allow for a higher density of single-family development. The proposed density will be consistent with the existing General Plan Designation of Low-Density Residential. The proposed Planned Development zoning district will include all uses and development standards permitted in the R-1 zoning district with the exception of lot coverage. The applicant has proposed the resulting parcels to be permitted to develop building space of up to 50% of the total lot size, an increase of 10% from the current R-A zoning district. The applicant has requested this to achieve a greater flexibility in siting the housing product offered. The proposed lots will be served by the Denair Community Service District (CSD) for public water and sewer services.

A referral response from the City of Turlock received during the early consultation of the project, stated that the projects proposed amendment of the Denair Community Plan from Estate Residential to Low-Density Residential would conflict with the Implementation Measures One and Two of Goal Two of the Denair Community Plan. Goal Two of the Denair Community Plan states that the Community Plan should provide a well-defined community edge between Denair and adjacent agricultural land, as well as between Denair and the City of Turlock. Implementation Measures One and Two state that Estate Residential shall be designated along the northerly, westerly, and easterly periphery of the Denair Community to reduce urban density toward the edge of the Community Plan area and that the sizing of sewer and water lines should be reduced as they approach the northerly, westerly, and easterly periphery of the Denair Community Plan area, to limit growth influences beyond the plan area.

The project site itself is near the periphery of the Denair Community Plan, however, there are parcels between the project site and the western border of the community plan. With the exception of the previously developed single-family dwelling subdivision that abuts the project site to the west, which holds a Community Plan Designation of Medium Density Residential. The remaining parcels that border the Community Plan have a Community Plan Designation of Estate Residential. Therefore, the proposed amendment to the Community Plan will not affect the parcels that actually border the Community Plan and will continue to provide a rural interface with the agricultural zoned land to the west of Denair. As stated earlier, the proposed project will tie into the existing Denair Community Service facilities for public water and sewer services via a 12-inch water main and 8-inch sewer main that are already utilized for the adjacent single-family development and mobile home park to the west of the site. The tie-in to the system will not include any upsizing of the existing water and sewer lines, as the existing lines would maintain their existing capacities. Thus, development of the proposed project will not be in conflict with Goal Two of the Denair Community Plan.

Amending the community plan requires a General Plan Amendment. As stated in the County's General Plan, General Plan Amendments affect the entire County and any evaluation must give primary concern to the County as a whole; therefore, a fundamental question must be asked in each case: "Will this amendment, if adopted, generally improve the economic, physical and social well-being of the County in general?". Additionally, the County in reviewing General Plan amendments shall consider how the levels of public and private service might be affected; as well as how the proposal would advance the long-term goals of the County. In each case, in order to take affirmative action regarding a General Plan Amendment application, it must be found that the General Plan Amendment will maintain a logical land use pattern without detriment to existing and planned land uses and that the County and other affected government agencies will be able to maintain levels of service consistent with the ability of the government agencies to provide a reasonable level of service. In the case of a proposed amendment to the Land Use diagrams of the Land Use Element, an additional finding that the amendment is consistent with the goals and policies of the General Plan must also be made. Additionally, Goal Two of the Land Use Element aims to ensure compatibility between land uses. If approved, the proposed Denair Community Plan Designation of Low-Density Residential and Planned Development zoning district, consisting of Single-Family Residential (R-1) standards, with the exception of a 50% lot coverage limit, will be consistent with the parcel's General Plan Land Use Designation of Low-Density residential.

The Land use element of the General Plan describes Low-Density Residential designation as intended to provide appropriate locations and adequate areas for single-family detached homes in either conventional or clustered configurations. The General Plan also states that the Low-Density designation can be utilized with a Planned Development zoning district, when the building intensity of the development does not exceed eight (8) units per net acre. As stated previously, the proposed Planned Development zoning will include all uses and development standards permitted in the R-1 zoning district with the exception of lot coverage. The applicant has proposed the resulting parcels to be permitted to develop building space of up to 50% of the total lot size, an increase of 10% from the current R-A zoning district. The applicant has requested this to achieve a greater flexibility in siting the housing product offered. The proposed lots will be served by the Denair Community Service District (CSD) for public water and sewer services. The overall density of the proposed development is 4.4 units per net acre, well within the Low-Density Residential Designation density threshold.

The maximum number of residential units the proposed project could develop is 207 units, with each new lot able to be developed with a single-family dwelling, an accessory dwelling unit, and a junior accessory unit. Maximum density restrictions are not considered when developing accessory dwelling units in accordance with Senate Bill (SB) 13. The extension of Denair CSD water and sewer services will not induce any further growth as the development is an infill project. As stated previously, the site is surrounded by similar single-family residential, a middle school and high school, as well as a mobile home park to the west of the project site.

Goal Four of the County's Open Space Element of the General Plan and Goal four of the Denair Community Plan requires at least three net acres of developed neighborhood parks, or the maximum number allowed by law, to be provided for every 1,000 residents. The proposed project will subdivide an 18.6 ± acre parcel into 72 total lots, for development of a residential subdivision. Based on the number of lots being created, the applicant is required to dedicate parkland for the purpose of achieving the net acres outlined in the Denair Community Plan. As discussed previously, the applicant has proposed to develop and dedicate a 1.5± acre dual use stormwater basin and park, on the northeastern boundary of the parcel. The basin will be planted in grass as well as perimeter landscaping consisting of trees, shrubs and groundcover. Additionally, the applicant proposes to install a meandering sidewalk and benches around the perimeter of the stormwater basin and park. The Parks and Recreation Department of the County has determined the dedication of the dual use stormwater basin and park will satisfy the County's parkland dedication requirement.

As discussed in Section II, all new or expanding uses approved by discretionary permit in the A-2 zoning district or on a parcel adjoining the A-2 zoning district are required to incorporate a minimum 150-foot-wide agricultural buffer setback, or 300-foot-wide buffer setback for people intensive uses. Public roadways, utilities, drainage facilities, rivers and adjacent riparian areas, landscaping, parking lots, and similar low people intensive uses are permitted uses within the buffer setback area. A residential subdivision would be considered a people intensive use. The parcel to the north of the project is zoned General Agriculture (A-2-10). The applicant proposes to develop a 1.5± acre dual use stormwater basin and park, to be developed on the northeastern boundary of the parcel. The basin will be planted in grass as well as perimeter landscaping consisting of trees, shrubs and groundcover. The northern boundary of the basin park will include a row of evergreen trees and a chain-link fence to act as an agricultural buffer from the adjacent General Agriculture (A-2-10) parcel. The County's Agricultural Commissioner was referred the project and has not stated any issues with the proposed agricultural buffer.

In accordance with Goal Three of the Denair Community Plan, providing for the non-motorized transportation needs of the Denair Community, the frontage along East Monte Vista Avenue and each interior street will be developed with curb, gutter, and sidewalk. Lastly, the applicant proposes to install sidewalks along the frontage of the adjacent Denair Unified School District, linking to the existing sidewalk that has only been developed on a portion of the parcel and the proposed development.

The project will not physically divide an established community nor conflict with any habitat conservation plans, therefore the project is not anticipated to have result in any significant impacts on land use.

Mitigation: None.

References: Email Correspondence with the Parks and Recreation Department, dated April 20, 2022; Can Serve letter from Denair Community Service District, dated May 12, 2022; Referral Response from the City of Turlock, dated August 13, 2021; Denair Community Plan; Stanislaus County General Plan and Support Documentation[1].

XII. MINERAL RESOURCES -- Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Included	Less Than Significant Impact	No Impact
a) **Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?**			X	
b) **Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?**			X	

Discussion: The location of all commercially viable mineral resources in Stanislaus County has been mapped by the State Division of Mines and Geology in Special Report 173. There are no known significant resources on the site, nor is the project site located in a geological area known to produce resources.

Mitigation: None.

References: Application Materials; Stanislaus County General Plan and Support Documentation[1].

XIII. NOISE -- Would the project result in:	Potentially Significant Impact	Less Than Significant With Mitigation Included	Less Than Significant Impact	No Impact
a) **Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?**			X	
b) **Generation of excessive groundborne vibration or groundborne noise levels?**			X	
c) **For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?**			X	

Discussion: The Stanislaus County General Plan identifies noise levels up to 55 dB Ldn (or CNEL) as the normally acceptable level of noise for Residential uses. The proposed project is required to comply with the noise standards included in the General Plan and Noise Control Ordinance. The applicant has proposed masonry walls along the Monte Vista Avenue frontage, which provide sound dampening for the residences of the subdivision. On-site grading and construction resulting from this project may result in a temporary increase in the area's ambient noise levels. As such, the project will be conditioned to abide by County regulations related to hours and days of construction. Noise impacts associated with on-site activities and traffic are not anticipated to exceed the normally acceptable level of noise. Impacts associated with noise are considered to be less-than significant.

The site is not located within an airport land use plan.

Mitigation: None.

References: Application information; Stanislaus County Zoning Ordinance; and the Stanislaus County General Plan and Support Documentation[1].

XIV. POPULATION AND HOUSING -- Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Included	Less Than Significant Impact	No Impact
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			X	
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?			X	

Discussion: The proposed project will not create significant service extensions or new infrastructure which could be considered as growth inducing, as services are available to neighboring properties and the project site is included in the service area of the Denair Community Service District. The proposed project will subdivide an 18.6 ± acre parcel into 72 total lots, for development of a residential subdivision. Of the 72 total lots created, 69 will be for the development of single-family dwellings. The remaining three lots will be used as a dual use stormwater basin/park and two landscaped stormwater swales.

A referral response from the City of Turlock received during the early consultation of the project, stated that the projects proposed amendment of the Denair Community Plan from Estate Residential to Low-Density Residential would conflict with the Implementation Measures One and Two of Goal Two of the Denair Community Plan. Goal Two of the Denair Community Plan states that the Community Plan should provide a well-defined community edge between Denair and adjacent agricultural land, as well as between Denair and the City of Turlock. Implementation Measures One and Two state that Estate Residential shall be designated along the northerly, westerly, and easterly periphery of the Denair Community to reduce urban density toward the edge of the Community Plan area and that the sizing of sewer and water lines should be reduced as they approach the northerly, westerly, and easterly periphery of the Denair Community Plan area, to limit growth influences beyond the plan area.

The project site itself is near the periphery of the Denair Community Plan, however, there are parcels between the project site and the western border of the community plan. With the exception of the previously developed single-family dwelling subdivision that abuts the project site to the west, which holds a Community Plan Designation of Medium Density Residential. The remaining parcels that border the Community Plan have a Community Plan Designation of Estate Residential. Therefore, the proposed amendment to the Community Plan will not affect the parcels that actually border the Community Plan and will continue to provide a rural interface with the agricultural zoned land to the west of Denair. As stated earlier, the proposed project will tie into the existing Denair Community Service facilities for public water and sewer services via a 12-inch water main and 8-inch sewer main that are already utilized for the adjacent single-family development and mobile home park to the west of the site. The tie-in to the system will not include any upsizing of the existing water and sewer lines, as the existing lines would maintain their existing capacities.

The proposed project requests to amend the Denair Community Plan designation from Estate Residential to Low-Density Residential and the zoning designation from Rural Residential (R-A) to Planned Development (P-D). The Land use element of the General Plan describes Low-Density Residential designation as intended to provide appropriate locations and adequate areas for single-family detached homes in either conventional or clustered configurations. The General Plan also states that the Low-Density designation can be utilized with a Planned Development zoning district, when the building intensity of the development does not exceed eight (8) units per net acre. As stated previously, the proposed Planned Development zoning will include all uses and development standards permitted in the R-1 zoning district with the exception of lot coverage. The applicant has proposed the resulting parcels to be permitted to develop building space of up to 50% of the total lot size, an increase of 10% from the current R-A zoning district. The applicant has requested this to achieve a greater flexibility in siting the housing product offered. The proposed lots will be served by the Denair Community Service District (CSD) for public water and sewer services. The overall density of the proposed development is 4.4 units per net acre, well within the Low-Density Residential Designation density threshold.

The maximum number of residential units the proposed project could develop is 207 units, with each new lot able to be developed with a single-family dwelling, an accessory dwelling unit, and a junior accessory unit, which will count toward fulfilling the County's Regional Housing Needs Allocation for moderate housing needs. As mentioned in Section XI – Land Use and Planning, maximum density restrictions are not considered when developing accessory dwelling units in accordance with Senate Bill (SB) 13. The extension of Denair CSD water and sewer services will not induce any further growth as the development is an infill project. As stated previously, the site is surrounded by similar single-family residential, a middle school and high school, as well as a mobile home park to the west of the project site.

Mitigation: None.

References: Application Materials; CA SB 13, Wieckowski. Accessory dwelling units, October 9, 2019; Stanislaus County General Plan, Appendix I-A3: Denair Community Plan, and Support Documentation[1].

XV. PUBLIC SERVICES --	Potentially Significant Impact	Less Than Significant With Mitigation Included	Less Than Significant Impact	No Impact
a) Would the project result in the substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:			X	
Fire protection?			X	
Police protection?			X	
Schools?			X	
Parks?			X	
Other public facilities?			X	

Discussion: The project site is served by the Denair Rural Fire District, the Denair Unified and Turlock Unified School District, Stanislaus County Sheriff Department for police protection, the Keyes Community Services District for public water and sewer, Stanislaus County Parks and Recreation Department for parks facilities, and the Turlock Irrigation District (TID) for power. County adopted Public Facilities Fees, as well as fire and school fees are required to be paid based on the development type prior to issuance of a building permit. Payment of the applicable district fees will be required prior to issuance of a building permit. All new dwellings will be required to pay the applicable Public Facility Fees through the building permit process. The Sheriff's Department also uses a standardized fee for new dwellings that will be incorporated into the Development Standards. As discussed in Section XI – Land Use and Planning, the General Plan and the Denair Community Plan requires at least three net acres of developed neighborhood parks, or the maximum number allowed by law, to be provided for every 1,000 residents. The applicant has proposed to develop and dedicate a 1.5± acre dual use stormwater basin and park, on the northeastern boundary of the parcel. The basin will be planted in grass as well as perimeter landscaping consisting of trees, shrubs and groundcover. Additionally, the applicant proposes to install a meandering sidewalk and benches around the perimeter of the stormwater basin and park. The Parks and Recreation Department of the County has determined the dedication of the dual use stormwater basin and park will satisfy the County's parkland dedication requirement.

The Turlock Irrigation District provided a referral response to the project indicating that electric service can be provided to the proposed lots. TID indicated that the owner/developer must apply for a facility change for any pole or electrical facility relocation, and that any facility changes be performed at the developer's expense. TID's request will be added to the project as a condition of approval should any facility changes be required prior to issuance of a building permit.

Storm water is proposed to be conveyed to a dual use stormwater basin and park on the northeastern boundary of the parcel. Consequently, the Public Works Department provided a referral letter requesting that prior to recording of the final map, a county service area (CSA) shall be formed to provide funds to ensure future maintenance and eventual replacement of the storm drainage system, block wall, and any landscaped areas. The developer shall provide all necessary documents and pay all fees associated with the formation of the CSA. As part of the formation, a formula or method for the calculation of the annual assessment shall be approved. Public Works' request will be added to the project as development standards.

Water and sewer for the proposed project will be served by the Denair Community Services District (CSD). As discussed in Section XI – Land Use and Planning, the Denair CSD provided a letter indicating the ability of the CSD to serve water and sewer to the project site.

Mitigation: None.

References: Email Correspondence with the Parks and Recreation Department, dated April 20, 2022; Can Serve letter from Denair Community Service District, dated May 12, 2022; Referral Response Stanislaus County Department of Public Works, dated May 26, 2022; Referral response from Turlock Irrigation District, dated June 22, 2021; Stanislaus County General Plan and Support Documentation[1].

XVI. RECREATION --	Potentially Significant Impact	Less Than Significant With Mitigation Included	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?			X	
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?			X	

Discussion: The General Plan and the Denair Community Plan requires at least three net acres of developed neighborhood parks, or the maximum number allowed by law, to be provided for every 1,000 residents. Based on the number of lots being created, the applicant is required to dedicate parkland for the purpose of achieving the net acres outlined in the Denair Community Plan. The proposed project will subdivide an 18.6 ± acre parcel into 72 total lots, for development of a residential subdivision. As discussed previously, the applicant has proposed to develop and dedicate a 1.5± acre dual use stormwater basin and park, on the northeastern boundary of the parcel. The basin will be planted in grass as well as perimeter landscaping consisting of trees, shrubs and groundcover. Additionally, the applicant proposes to install a meandering sidewalk and benches around the perimeter of the stormwater basin and park. The Parks and Recreation Department of the County has determined the dedication of the dual use stormwater basin and park will satisfy the County's parkland dedication requirement.

Mitigation: None.

References: Email Correspondence with the Parks and Recreation Department, dated April 20, 2022; Stanislaus County General Plan and Support Documentation[1].

XVII. TRANSPORTATION -- Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Included	Less Than Significant Impact	No Impact
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?			X	
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?			X	
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?		X		
d) Result in inadequate emergency access?			X	

Discussion: The proposed project will subdivide an 18.6 ± acre parcel into 72 total lots, for development of a residential subdivision. Of the 72 total lots created, 69 will be for the development of single-family dwellings. The remaining three lots will be used as a dual use stormwater basin/park and two landscaped stormwater swales.

The project site fronts East Monte Vista Avenue and proposes to develop interior residential streets for the development. The frontage along East Monte Vista Avenue and each interior street will be developed with curb, gutter, and sidewalk. The sidewalks will also be developed with street lighting at various points throughout the development. The East Monte Vista Avenue intersection will serve as the main entry into the development, by proposing completion of East Monte Vista Avenue by: dedicating 55 feet of right-of-way north of the centerline of the road; installing a 29-foot paved lane, and matching curb, gutter, and sidewalk along East Monte Vista Avenue. The applicant has proposed a stub out near the northwest boundary of the project site, to provide connectivity for any future residential development on the two adjacent parcels designated as Estate Residential in the Denair Community Plan. Lastly, the applicant proposes to install sidewalks along the frontage of the adjacent Denair Unified School District, linking to the existing sidewalk that has only been developed on a portion of the parcel and the proposed development.

A referral response from the County Environmental Review Committee was received, stating that to further study potential impacts to the local transportation network, a Traffic Impact Study should be performed with an evaluation of Vehicle Miles Traveled (VMT), as well as evaluation of potential traffic safety impacts to the intersection of Main Street and Lester Roads, and East Monte Vista and Waring Road. Additionally, a referral response from the City of Turlock also requested a Traffic Impact Analysis be completed for the project.

A Traffic Impact Assessment was completed by Barrios Transportation Consulting on April 29, 2022. The assessment conducted an analysis of the above intersections during the peak hours of 7:00AM to 9:00AM and 4:00PM to 6:00PM, as well as a daily road segment analysis of Monte Vista Avenue between Waring and Lester Roads. Due to the Covid-19 pandemic, the assessment included traffic counts of the study area from 2016 and 2017 as well. The assessment found that traffic levels at the studied intersections would remain relatively unchanged from their existing level of service ratings as a result of project development. The assessment also noted, that although the proposed project would not exceed daily per lane volumes in any peak hour, the project would develop an exclusive 100-foot-long left turn left from East Monte Vista into the project site. Lastly, the assessment recommended that a vehicle stop sign be installed at the project entrance of Proposed Street A and East Monte Vista avenue, to ensure that project traffic leaving the site would be required to stop and yield to through traffic on East Monte Vista Avenue. This recommendation will be added as a mitigation measure of the project.

As required by CEQA Guidelines Section 15064.3, potential impacts to transportation should be evaluated using Vehicle Miles Traveled (VMT). Stanislaus County has currently not adopted any significance thresholds for VMT, and projects are treated on a case-by case basis for evaluation under CEQA. However, the State of California - Office of Planning and Research (OPR) has issued guidelines regarding VMT significance under CEQA. The CEQA Guidelines identify vehicle miles traveled (VMT), which is the amount and distance of automobile travel attributable to a project, as the most appropriate measure of transportation impacts. According to the same technical advisory from OPR, projects that generate or attract fewer than 110 trips per-day generally or achieves a 15% reduction of VMT may be assumed to cause a less-than significant transportation impact. As stated earlier, the Traffic Impact Assessment included an analysis of VMT for the proposed project, as it could not be screened out, per the OPR guidelines by project characteristics such as: proximity to major transit stops; affordable residential development; local serving retail; and being located in low VMT areas.

The VMT analysis compiled a VMT baseline for the Community of Denair utilizing the Three County Travel Demand Forecasting model developed by the County. This included utilizing 2019/2020 Average Daily Travel Conditions of all residential dwellings in Denair, and dividing by the total number of single-family dwellings within Denair, for a VMT of 197.3 miles traveled per household. The analysis found that the average trip length to be 20.9 miles per trip. The 2045 cumulative (full buildout) conditions for the Community of Denair; VMT was determined to be 196.4 miles traveled per household, which was a .9-mile VMT reduction per household under the cumulative scenario.

The VMT analysis portion of the assessment, found that based on the project location near the western boundary of the community of Denair, the average project trip length would be 20.1 miles per trip, which would lower the baseline VMT of the project to 189.7 miles traveled per household, a reduction of 3.8% from the cumulative baseline. Additionally, the analysis found that the proposed project’s improvement of connective sidewalk between the project site and the adjacent Denair High School would account for two less vehicle trips per day, which would equate to 175.6 vehicle miles traveled per household for the project, a 7.4% VMT reduction from the cumulate baseline scenario. In total, the project would reduce VMT a total of 11% than the 2045 cumulative conditions.

Although the project does not meet OPR’s technical guideline, which identifies a 15% reduction in VMT, the project is considered an infill residential project, as the project site was already identified in the Denair Community Plan for residential uses, which was accounted for under previous environmental analysis. Accordingly, VMT impacts are considered to be less than significant.

A referral response was received from the County's Public Works Department, which included requirements for site development standards that would account for the TIA findings as well as the County's Standards and Specifications for subdivisions. Development standards were also included for: right of way dedication for both East Monte Vista and proposed A, B, and C streets; requirements for final map recordation; requirements for submission of improvement plans; grading and drainage plan requirements, including removal or relocation of existing irrigation facilities; inclusion of a 10' Public Utilities Easement along the frontage of each parcel; annexation of the project to the existing Community Service District and Lighting and Landscaping District for funding of improvement maintenance; and requirements regarding connection to the Denair CSD prior to the final map being recorded. These requirements will be added to the project as development standards.

All development onsite will be required to pay applicable County PFF fees, including the Regional Transportation Impact Fee, which will be utilized for maintenance and traffic congestion improvements to all County roadways.

The proposed project is not anticipated to conflict with any transportation program, plan, ordinance or policy.

Mitigation:

1. A traffic control device for the intersection of East Monte Vista Avenue and Proposed Street A shall be included in the project improvement plans and shall be installed prior to the final acceptance of the subdivision improvements by the Board of Supervisors.

References: Referral response from the Stanislaus County Public Works Department dated May 26, 2022 Referral Response from the City of Turlock, dated August 13, 2021; Traffic Impact Assessment performed by Barrios Traffic Consulting, dated April 29, 2022; Stanislaus County General Plan and Support Documentation[1].

XVIII. TRIBAL CULTURAL RESOURCES -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California native American tribe, and that is:			X	
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or			X	
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set for the in subdivision (c) of Public Resource Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.			X	

Discussion: It does not appear this project will result in significant impacts to any tribal cultural resource. A records search for the project site formulated by the Central California Information Center (CCIC) indicated that there was a low probability of discovery of prehistoric resources, but there may be discovery of historical resources as it is possible the project will impact existing structures that are over 45 years old, and possibly subsurface historic-era refuse and artifact under the surface which may be found during excavation and trenching. No records were found that indicated the site contained prehistoric or archeologic resources previously identified onsite. While the existing structures onsite will be demolished as part of the site development, the County does not use age as an indication of historic resources. The barn on the project site is not federally or state registered as a historic structure and is not located within a historic zoning district. Accordingly, the demolition of these structures is not considered a significant impact to cultural resources.

The project was referred to tribal governments listed with the Native American Heritage Commission (NAHC), as required by SB 18, and no responses have been received to date. Stanislaus County has not received any requests for consultation, in accordance with AB 52. A development standard regarding the discovery of cultural resources during the construction process will be added to the project.

Mitigation: None.

References: Central California Information Center Report for the project site, March 16, 2021; Stanislaus County General Plan and Support Documentation[1].

XIX. UTILITIES AND SERVICE SYSTEMS -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?			**X**	
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?			**X**	
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?			**X**	
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?			**X**	
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?			**X**	

Discussion: Limitations on providing services have not been identified. The proposed project will subdivide an 18.6 ± acre parcel into 72 total lots, for development of a residential subdivision. Of the 72 total lots created, 69 will be for the development of single-family dwellings. The remaining three lots will be used as a dual use stormwater basin/park and two landscaped stormwater swales. The proposed lots will be served by the Denair Community Service District (CSD) for public water and sewer services.

The applicant proposes to develop a 1.5± acre dual use stormwater basin and park, to be developed on the northeastern boundary of the parcel. The basin will be planted in grass as well as perimeter landscaping consisting of trees, shrubs and groundcover. The applicant has proposed two landscaped stormwater swales running east to west along the East Monte Vista Avenue frontage. The swales will be a continuation of the swale developed on the adjacent parcel to the west. The swales will be bordered on the northern end, by a masonry wall with landscaping on the south side of the wall. A referral response was received from the County's Public Works Department requiring annexation of the project to the existing Community Service District and Lighting and Landscaping District for funding of improvement maintenance; and requirements regarding connection to the Denair CSD prior to the final map being recorded. These requirements will be added to the project as development standards.

A referral response was received from TID regarding the existing and proposed electrical utilities. TID indicated that electric service can be provided to the development. Any facility changes are to be performed at the developer's expense. Development standards reflecting TID's comments will be placed on the project.

The Denair Community Services District (CSD) provided a letter indicating the capacity of the CSD to serve water and sewer to the project site. The letter indicated that the CSD will require the owner/developer to enter into an Agreement with the Denair CSD to construct and pay for necessary infrastructure to enable the District to provide water and sewer services to the project. The Agreement will require the infrastructure be constructed to District specifications, and that security be given to the District to guarantee performance and payment for the infrastructure, and that all current connection fees be paid in full.

A referral response was received from the Department of Environmental Resources which will require the project site to obtain a Will-Serve letter for water and sewer services to serve the development, issued from the Denair Community Services District, and that the applicant receive the appropriate permits for demolition of the existing septic facilities on-site. These requirements will be reflected in the development standards for this project. The Department of Public Works will review and approve grading and drainage plans prior to construction. Development standards will be added to the project to reflect these requirements.

Mitigation: None.

References: Application material; Can Serve letter from Denair Community Service District, dated May 12, 2022; Referral Response Stanislaus County Department of Public Works, dated May 26, 2022; Referral Response from the Stanislaus County Department of Environmental Resources, dated May 17, 2022; Referral response from Turlock Irrigation District, dated June 22, 2021; Stanislaus County General Plan and Support Documentation[1].

XX. WILDFIRE – If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?			**X**	
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?			**X**	
c) Require the installation of maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?			**X**	
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?			**X**	

Discussion: The Stanislaus County Local Hazard Mitigation Plan from the Department of Emergency Services, identifies risks posed by disasters and identifies ways to minimize damage from those disasters. With the Wildfire Hazard Mitigation Activities of this plan in place, impacts to an adopted emergency response plan or emergency evacuation plan are anticipated to be less than significant. The terrain of the site is relatively flat, and the site has access to a County-maintained road. The site is located in a Local Responsibility Area (LRA) for fire protection and is served by the Denair Fire Protection District. The project was referred to the District, but no comments have been received to date. All improvements will be reviewed by the Stanislaus County Fire Prevention Bureau and will be required to meet all State and Local fire code requirements.

Wildfire risk and risks associated with postfire land changes are considered to be less than significant.

Mitigation: None.

References: Stanislaus County General Plan and Support Documentation[1].

XXI. MANDATORY FINDINGS OF SIGNIFICANCE --	Potentially Significant Impact	Less Than Significant With Mitigation Included	Less Than Significant Impact	No Impact
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?			X	
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)			X	
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?			X	

Discussion: Review of this project has not indicated any features which might significantly impact the environmental quality of the site and/or the surrounding area. The project site is adjacent to similar single-family dwellings and a mobile home park to the west and southeast; Denair Middle and High School to the east; and agricultural zoned parcels to the north and south that are within the Denair Community Plan. The project proposes to request to amend the Denair Community Plan designation from Estate Residential to Low-Density Residential and the zoning designation from Rural Residential (R-A) to Planned Development (P-D) on an 18.6± acre parcel, and to subdivide the project site into 72 parcels, with lots ranging in size from 7,223 to 14,962 square feet, to allow for low-density residential development. Of the 72 total lots created, 69 will be for the development of single-family dwellings. The remaining three lots will be used as a dual use stormwater basin/park and two landscaped stormwater swales.

An unaffiliated application, 1.2 miles to the east of the project site, Rezone and Vesting Tentative Subdivision Map Application No. PLN2021-0101 – Hoffman Ranch, proposes to create 67 parcels for single-family development. Additionally, two previous residential projects have been approved in the Community of Denair, GPA REZ and PM Application No. PLN2021-0009 – WPD Homes, approved to create three parcels for the development of two single-family dwellings and five duplexes; and VSTM Application No. PLN2020-0120 – Isaaco Estates, which was approved to create 11 parcels for single-family residential development. The proposed project and these other residential projects, proposed and approved, have been included in the Denair Community Plan for the purpose of residential development, and are considered to be infill projects, which are not expected to create any significant cumulative impacts.

The closest agriculturally zoned property, which abuts the site to the north, and just south of East Monte Vista Avenue, are included in the Denair Community Plan as Estate Residential. Any development of these surrounding agricultural parcels would be subject to the permitted uses of the applicable zoning district the property is located within or would require additional land use entitlements and environmental review. Residential development of these parcels would be further limited by Measure E, which requires a vote of the entire County for projects that propose to convert agriculturally zoned parcels to residential uses. The proposed projects Community Plan Designation of Low-Density Residential would be appropriate for the proposed residential development for the project.

In response to the City of Turlock's referral response, the proposed project will tie into the existing Denair Community Service facilities for public water and sewer services via a 12-inch water main and 8-inch sewer main that are already utilized for the adjacent single-family development and mobile home park to the west of the site. The tie-in to the system will not include any upsizing of the existing water and sewer lines, as the existing lines would maintain their existing capacities. Thus, development of the proposed project will not be in conflict with Goal Two of the Denair Community Plan.

No cumulative impacts are anticipated as a result of this project. The proposed project will not create significant service extensions or new infrastructure which could be considered as growth inducing, as services are available to neighboring properties. Additionally, and as discussed throughout the document, the proposed project would be developed in accordance with the implementation measures listed under Goal Two, Policy Two of the Denair Community Plan, the sizing of sewer and water lines should be reduced as they approach the northerly, westerly and easterly periphery of the Denair Community Plan area to limit growth influences beyond the Plan area.

Mitigation: None.

References: Initial Study; Stanislaus County General Plan and Support Documentation[1].

---

[1]Stanislaus County General Plan and Support Documentation adopted in August 23, 2016, as amended. ***Housing Element*** adopted on April 5, 2016.

Air Quality and Greenhouse Gas Technical Report

for the

Monte Vista Subdivision Project

May 19, 2022

Prepared for:

Lazares Companies
16795 Lark Avenue, Suite 106
Los Gatos, CA 95032
(209) 662-5098

Prepared by:

De Novo Planning Group
1020 Suncast Lane, Suite 106
El Dorado Hills, CA 95762
(916) 580-9818

De Novo Planning Group

A Land Use Planning, Design, and Environmental Firm

Air Quality and Greenhouse Gas Technical Report

for the

Monte Vista Subdivision Project

May 19, 2022

Prepared for:

Lazares Companies
16795 Lark Avenue, Suite 106
Los Gatos, CA 95032
(209) 662-5098

Prepared by:

De Novo Planning Group
1020 Suncast Lane, Suite 106
El Dorado Hills, CA 95762
(916) 580-9818

1.1 PROJECT LOCATION

The Project site is located in the unincorporated community of Denair, Stanislaus County. The Project site is located at 3531 East Monte Vista Avenue (APN 024-012-009) and is located immediately east of the County Squire Estates Mobile Home Park. Figure 1a and 1b provides the proposed Project tentative subdivision map with cross sections and details.

1.2 PROJECT SETTING

EXISTING SITE CONDITIONS

The Project site is 18.6 gross acres and 15.9 net developable acres, and includes 69 single-family residences. The proposed Project includes an amendment to the Denair Community Plan from the Estate Residential land use to the Residential-Low land use, and to subdivide an 18.6 acres parcel into 73 total lots. There will be 69 single-family dwellings, and two landscape storm water swales. The proposed Project also includes a 1.5-acre dual use storm water basin and park, with appropriate landscaping. Lastly, the proposed Project includes sidewalks along the frontage of the adjacent Denair Unified School District.

EXISTING SITE USES AND SURROUNDING USES

The Project site includes an existing orchard and five existing residential buildings. The Project site is surrounded by a variety of existing agricultural, residential, and public land uses. Uses immediately south and north of the Project site include agricultural and residential uses. A mobile home park is located to the west of the Project site, and Denair High School is located east of the Project site. The Project site is located north of and adjacent to E. Monte Vista Avenue.

TENTATIVE SUBDIVISION MAP

The proposed Project includes a Tentative Subdivision Map for the Project site. The typical lot size is 60 by 130 feet. The net density of the Project site is 4.4 dwelling units per acre. Each lot would include a minimum of a two-car garage, and two driveway spaces per lot. Water and sanitary sewer would be provided by the Denair Community Service District; storm drainage would be provided by a private retention system; gas would be provided by PG&E; electricity by Turlock Irrigation District (TID); telephone by AT&T; and the school district would by Denair Unified School District.

Figure 1a: Tentative Subdivision Map

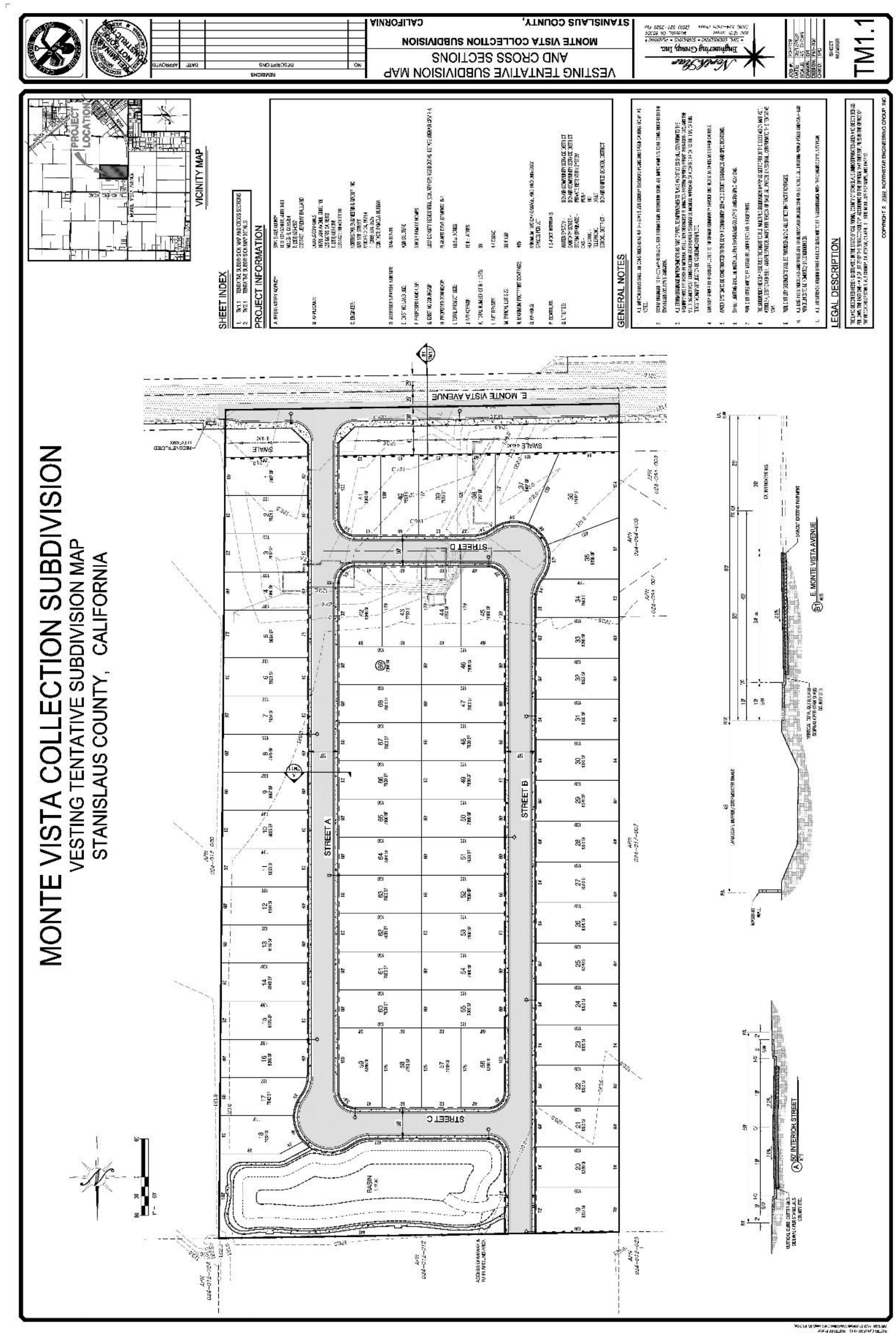
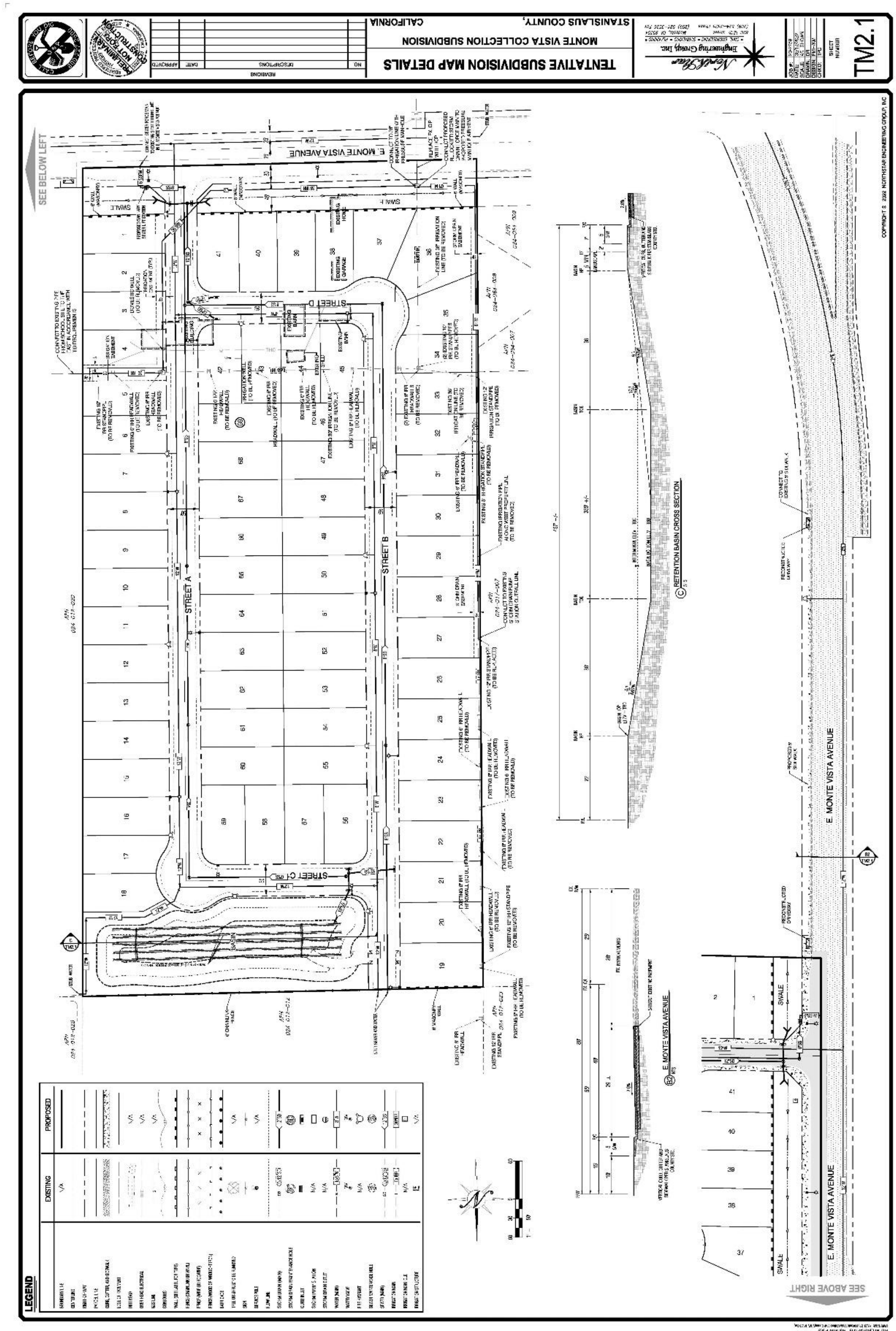


Figure 1b: Tentative Subdivision Map



This section describes the regional air quality, current attainment status of the air basin, local sensitive receptors, emission sources, and impacts that are likely to result from Project implementation. The analysis contained in this section is intended to be at a project-level, and covers impacts associated with the conversion of the entire site to urban uses. Following this discussion is an assessment of consistency of the proposed Project with applicable policies and local plans. The Greenhouse Gases and Climate Change analysis is located in a separate section of this document. This section is based in part on the following technical studies: *Air Quality and Land Use Handbook: A Community Health Perspective* (California Air Resources Board [CARB], 2005), *Guide for Assessing and Mitigation Air Quality Impacts* (San Joaquin Valley Air Pollution Control District [SJAVPCD], 2002), *Guidance for Assessing and Mitigating Air Quality Impacts - 2015* (SJAVPCD, 2015), and CalEEMod *(v.2020.4.0)*.

2.1 ENVIRONMENTAL SETTING

SAN JOAQUIN VALLEY AIR BASIN

Stanislaus County is in the southern portion of the San Joaquin Air Basin (SJVAB). The SJVAB consists of eight counties: Fresno, Kern (western and central), Kings, Tulare, Madera, Merced, San Joaquin, and Stanislaus. Air pollution from significant activities in the SJVAB includes a variety of industrial-based sources as well as on- and off-road mobile sources. These sources, coupled with geographical and meteorological conditions unique to the area, stimulate the formation of unhealthy air.

The SJVAB is approximately 250 miles long and an average of 35 miles wide. It is bordered by the Sierra Nevada in the east, the Coast Ranges in the west, and the Tehachapi Mountains in the south. There is a slight downward elevation gradient from Bakersfield in the southeast end (elevation 408 feet) to sea level at the northwest end where the valley opens to the San Francisco Bay at the Carquinez Straits. At its northern end is the Sacramento Valley, which comprises the northern half of California's Central Valley. The bowl-shaped topography inhibits movement of pollutants out of the valley (San Joaquin Valley Air Pollution Control District (SJVAPCD), 2015).

Climate

The SJVAB is in a Mediterranean climate zone and is influenced by a subtropical high-pressure cell most of the year. Mediterranean climates are characterized by sparse rainfall, which occurs mainly in winter. Summers are hot and dry. Summertime maximum temperatures often exceed 100°F in the valley.

The subtropical high-pressure cell is strongest during spring, summer, and fall and produces subsiding air, which can result in temperature inversions in the valley. A temperature inversion can act like a lid, inhibiting vertical mixing of the air mass at the surface. Any emissions of pollutants can be trapped below the inversion. Most of the surrounding mountains are above the normal height of summer inversions (1,500 to 3,000 feet).

Winter-time high pressure events can often last many weeks, with surface temperatures often lowering into the 30°F. During these events, fog can be present and inversions are extremely strong. These wintertime inversions can inhibit vertical mixing of pollutants to a few hundred feet (SJVAPCD, 2015).

Wind Patterns

Wind speed and direction play an important role in dispersion and transport of air pollutants. Wind at the surface and aloft can disperse pollution by mixing and transporting it to other locations.

Especially in summer, winds in the San Joaquin Valley most frequently blow from the northwest. The region's topographic features restrict air movement and channel the air mass towards the southeastern end of the valley. Marine air can flow into the basin from the San Joaquin River Delta and over Altamont Pass and Pacheco Pass, where it can flow along the axis of the valley, over the Tehachapi Pass, into the Southeast Desert Air Basin. This wind pattern contributes to transporting pollutants from the Sacramento Valley and the Bay Area into the SJVAB. Approximately 27 percent of the total emissions in the northern portion, 11 percent of total emissions in the central region, and 7 percent of total emission in the south valley of the SJVAB are attributed to air pollution transported from these two areas.[1] The Coastal Range is a barrier to air movement to the west and the high Sierra Nevada Range is a significant barrier to the east (the highest peaks in the southern Sierra Nevada reach almost halfway through the Earth's atmosphere). Many days in the winter are marked by stagnation events where winds are very weak. Transport of pollutants during winter can be very limited. A secondary but significant summer wind pattern is from the southeast and can be associated with nighttime drainage winds, prefrontal conditions, and summer monsoons.

Two significant diurnal wind cycles that occur frequently in the valley are the sea breeze and mountain-valley upslope and drainage flows. The sea breeze can accentuate the northwest wind flow, especially on summer afternoons. Nighttime drainage flows can accentuate the southeast movement of air down the valley. In the mountains during periods of weak synoptic scale winds, winds tend to be upslope during the day and downslope at night. Nighttime and drainage flows are especially pronounced during the winter when flow from the easterly direction is enhanced by nighttime cooling in the Sierra Nevada. Eddies can form in the valley wind flow and can recirculate a polluted air mass for an extended period.

Temperature

Solar radiation and temperature are particularly important in the chemistry of ozone formation. The SJVAB averages over 260 sunny days per year. Photochemical air pollution (primarily ozone) is produced by the atmospheric reaction of organic substances (such as volatile organic compounds) and nitrogen dioxide under the influence of sunlight. Ozone concentrations are very dependent on the amount of solar radiation, especially during late spring, summer, and early fall. Ozone levels typically peak in the afternoon. After the sun goes down, the chemical reaction between nitrous oxide and ozone begins to dominate. This reaction tends to scavenge and remove the ozone in the metropolitan areas through the early morning hours, resulting in the lowest ozone levels, possibly reaching zero at sunrise in areas with high nitrogen oxides emissions. At sunrise, nitrogen oxides tend to peak, partly due to low levels of ozone at this time and also due to the morning commuter vehicle emissions of nitrogen oxides.

[1] SJVAPCD. Frequently Asked Questions, http://www.valleyair.org/general_info/frequently_asked_questions.htm#What%20is%20being%20done%20to%20improve%20ai r%20quality%20in%20the%20San%20Joaquin%20Valley, accessed December 3, 2021.

Generally, the higher the temperature, the more ozone formed, since reaction rates increase with temperature. However, extremely hot temperatures can “lift” or “break” the inversion layer. Typically, if the inversion layer does not lift to allow the buildup of contaminants to be dispersed, the ozone levels will peak in the late afternoon. If the inversion layer breaks and the resultant afternoon winds occur, the ozone will peak in the early afternoon and decrease in the late afternoon as the contaminants are dispersed or transported out of the SJVAB.

Ozone levels are low during winter periods when there is much less sunlight to drive the photochemical reaction (SJVAPCD, 2015).

Precipitation, Humidity, and Fog

Precipitation and fog may reduce or limit some pollutant concentrations. Ozone needs sunlight for its formation, and clouds and fog can block the required solar radiation. Wet fogs can cleanse the air during winter as moisture collects on particles and deposits them on the ground. Atmospheric moisture can also increase pollution levels. In fogs with less water content, the moisture acts to form secondary ammonium nitrate particulate matter. This ammonium nitrate is part of the valley’s $PM_{2.5}$ and PM_{10} problem. The winds and unstable air conditions experienced during the passage of winter storms result in periods of low pollutant concentrations and excellent visibility. Between winter storms, high pressure and light winds allow cold moist air to pool on the SJVAB floor. This creates strong low-level temperature inversions and very stable air conditions, which can lead to tule fog. Wintertime conditions favorable to fog formation are also conditions favorable to high concentrations of $PM_{2.5}$ and PM_{10} (SJVAPCD, 2015).

Inversions

The vertical dispersion of air pollutants in the San Joaquin Valley can be limited by persistent temperature inversions. Air temperature in the lowest layer of the atmosphere typically decreases with altitude. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. The height of the base of the inversion is known as the “mixing height.” This is the level to which pollutants can mix vertically. Mixing of air is minimized above and below the inversion base. The inversion base represents an abrupt density change where little air movement occurs.

Inversion layers are significant in determining pollutant concentrations. Concentration levels can be related to the amount of mixing space below the inversion. Temperature inversions that occur on the summer days are usually 2,000 to 2,500 feet above the valley floor. In winter months, overnight inversions occur 500 to 1,500 feet above the valley floor (SJVAPCD, 2015).

CRITERIA POLLUTANTS

All criteria pollutants can have human health and environmental effects at certain concentrations. The United States Environmental Protection Agency (U.S. EPA) uses six "criteria pollutants" as indicators of air quality and has established for each of them a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called National Ambient Air Quality Standards (NAAQS). In addition, California establishes ambient air quality standards, called California Ambient Air Quality Standards (CAAQS). California law does not require that the CAAQS be met by a specified date as is the case with NAAQS.

The ambient air quality standards for the six criteria pollutants (as shown in Table 3.3-1) are set to public health and the environment within an adequate margin of safety (as provided under Section 109 of the Federal Clean Air Act). Epidemiological, controlled human exposure, and toxicology studies evaluate potential health and environmental effects of criteria pollutants, and form the scientific basis for new and revised ambient air quality standards. Principal characteristics and possible health and environmental effects from exposure to the six primary criteria pollutants generated by the Project are discussed below.

Ozone (O_3) is a photochemical oxidant and the major component of smog. While O_3 in the upper atmosphere is beneficial to life by shielding the earth from harmful ultraviolet radiation from the sun, high concentrations of O_3 at ground level are a major health and environmental concern. O_3 is not emitted directly into the air but is formed through complex chemical reactions between precursor emissions of volatile organic compounds (ROG) and oxides of nitrogen (NO_x) in the presence of sunlight. These reactions are stimulated by sunlight and temperature so that peak O_3 levels occur typically during the warmer times of the year. Both ROGs and NO_x are emitted by transportation and industrial sources. ROGs are emitted from sources as diverse as autos, chemical manufacturing, dry cleaners, paint shops and other sources using solvents. Relatedly, reactive organic compounds (ROG) are defined as the subset of ROGs that are reactive enough to contribute substantially to atmospheric photochemistry.

The reactivity of O_3 causes health problems because it damages lung tissue, reduces lung function and sensitizes the lungs to other irritants. Scientific evidence indicates that ambient levels of O_3 not only affect people with impaired respiratory systems, such as asthmatics, but healthy adults and children as well. Exposure to O_3 for several hours at relatively low concentrations has been found to significantly reduce lung function and induce respiratory inflammation in normal, healthy people during exercise. This decrease in lung function generally is accompanied by symptoms including chest pain, coughing, sneezing and pulmonary congestion.

Studies show associations between short-term ozone exposure and non-accidental mortality, including deaths from respiratory issues. Studies also suggest long-term exposure to ozone may increase the risk of respiratory-related deaths (U.S. EPA, 2019a). The concentration of ozone at which health effects are observed depends on an individual’s sensitivity, level of exertion (i.e., breathing rate), and duration of exposure. Studies show large individual differences in the intensity of symptomatic responses, with one study finding no symptoms to the least responsive individual after a 2-hour exposure to 400 parts per billion of ozone and a 50 percent decrement in forced airway volume in the most responsive individual. Although the results vary, evidence suggest that sensitive populations (e.g., asthmatics) may be affected on days when the 8-hour maximum ozone concentration reaches 80 parts per billion (U.S. EPA, 2019b). The average background level of ozone in California and Nevada is approximately 48.3 parts per billion, which represents approximately 77 percent of the total ozone in the western region of the U.S. (NASA, 2015).

In addition to human health effect, ozone has been tied to crop damage, typically in the form of stunted growth, leaf discoloration, cell damage, and premature death. O_3 can also act as a corrosive and oxidant, resulting in property damage such as the degradation of rubber products and other materials.

Carbon monoxide (CO) is a colorless, odorless and poisonous gas produced by incomplete burning of carbon in fuels. Carbon monoxide is harmful because it binds to hemoglobin in the blood, reducing the ability of blood to carry oxygen. This interferes with oxygen delivery to the body's organs. The most common effects of CO exposure are fatigue, headaches, confusion, and dizziness due to inadequate oxygen delivery to the brain. For people with cardiovascular disease, short-term CO exposure can further reduce their body's already compromised ability to respond to the increased oxygen demands of exercise, exertion, or stress. Inadequate oxygen delivery to the heart muscle leads to chest pain and decreased exercise tolerance. Unborn babies whose mothers experience high levels of CO exposure during pregnancy are at risk of adverse developmental effects. Exposure to CO at high concentrations can also cause fatigue, headaches, confusion, dizziness, and chest pain. There are no ecological or environmental effects to ambient CO (CARB, 2021d).

Very high levels of CO are not likely to occur outdoors. However, when CO levels are elevated outdoors, they can be of particular concern for people with some types of heart disease. These people already have a reduced ability for getting oxygenated blood to their hearts in situations where the heart needs more oxygen than usual. They are especially vulnerable to the effects of CO when exercising or under increased stress. In these situations, short-term exposure to elevated CO may result in reduced oxygen to the heart accompanied by chest pain also known as angina (U.S. EPA, 2016). Such acute effects may occur under current ambient conditions for some sensitive individuals, while increases in ambient CO levels increases the risk of such incidences.

Nitrogen oxides (NO_x) is a brownish, highly reactive gas that is present in all urban atmospheres. The main effect of increased NO_2 is the increased likelihood of respiratory problems. Under ambient conditions, NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Nitrogen oxides are an important precursor both to ozone (O_3) and acid rain and may affect both terrestrial and aquatic ecosystems. Longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma, as well as children and the elderly are generally at greater risk for the health effects of NO_2.

The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide (NO_x). NO_x plays a major role, together with ROGs, in the atmospheric reactions that produce O_3. NO_x forms when fuel is burned at high temperatures. The two major emission sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

Sulfur dioxide (SO_2) is one of the multiple gaseous oxidized sulfur species and is formed during the combustion of fuels containing sulfur, primarily coal and oil. The largest anthropogenic source of SO_2 emissions in the U.S. is fossil fuel combustion at electric utilities and other industrial facilities. SO_2 is also emitted from certain manufacturing processes and mobile sources, including locomotives, large ships, and construction equipment.

SO_2 affects breathing and may aggravate existing respiratory and cardiovascular disease in high doses. Sensitive populations include asthmatics, individuals with bronchitis or emphysema, children and the elderly. SO_2 is also a primary contributor to acid deposition, or acid rain, which causes acidification of lakes and streams and can damage trees, crops, historic buildings and statues. In addition, sulfur compounds in the air contribute to visibility impairment in large parts of the country. This is especially noticeable in national parks. Ambient SO_2 results largely from stationary sources such as coal and oil combustion, steel mills, refineries, pulp and paper mills and from nonferrous smelters.

Short-term exposure to ambient SO_2 has been associated with various adverse health effects. Multiple human clinical studies, epidemiological studies, and toxicological studies support a causal relationship between short-term exposure to ambient SO_2 and respiratory morbidity. The observed health effects include decreased lung function, respiratory symptoms, and increased emergency department visits and hospitalizations for all respiratory causes. These studies further suggest that people with asthma are potentially susceptible or vulnerable to these health effects. In addition, SO_2 reacts with other air pollutants to form sulfate particles, which are constituents of fine particulate matter ($PM_{2.5}$). Inhalation exposure to $PM_{2.5}$ has been associated with various cardiovascular and respiratory health effects (U.S. EPA, 2017). Increased ambient SO_2 levels would lead to increased risk of such effects.

SO_2 emissions that lead to high concentrations of SO_2 in the air generally also lead to the formation of other sulfur oxides (SOx). SOx can react with other compounds in the atmosphere to form small particles. These particles contribute to particulate matter (PM) pollution. Small particles may penetrate deeply into the lungs and in sufficient quantity can contribute to health problems.

Particulate matter (PM) includes dust, dirt, soot, smoke and liquid droplets directly emitted into the air by sources such as factories, power plants, cars, construction activity, fires and natural windblown dust. Particles formed in the atmosphere by condensation or the transformation of emitted gases such as SO_2 and ROGs are also considered particulate matter. PM is generally categorized based on the diameter of the particulate matter: PM_{10} is particulate matter 10 micrometers or less in diameter (known as respirable particulate matt*er*), and $PM_{2.5}$ is particulate matter 2.5 micrometers or less in diameter (known as fine particulate matter).

Based on studies of human populations exposed to high concentrations of particles (sometimes in the presence of SO_2) and laboratory studies of animals and humans, there are major effects of concern for human health. These include effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis and premature death. Small particulate pollution causes health impacts even at very low concentrations – indeed no threshold has been identified below which no damage to health is observed.

Respirable particulate matter (PM_{10}) consists of small particles, less than 10 microns in diameter, of dust, smoke, or droplets of liquid which penetrate the human respiratory system and cause irritation by themselves, or in combination with other gases. Particulate matter is caused primarily by dust from grading and excavation activities, from agricultural activities (as created by soil preparation activities, fertilizer and pesticide spraying, weed burning and animal husbandry), and from motor vehicles, particularly diesel-powered vehicles. PM_{10} causes a greater health risk than larger particles, since these fine particles can more easily penetrate the defenses of the human respiratory system.

$PM_{2.5}$ consists of fine particles, which are less than 2.5 microns in size. Similar to PM_{10}, these particles are primarily the result of combustion in motor vehicles, particularly diesel engines, as well as from industrial sources and residential/agricultural activities such as burning. It is also formed through the reaction of other pollutants. As with PM_{10}, these particulates can increase the chance of respiratory disease, and cause lung damage and cancer. In 1997, the U.S. EPA created new Federal air quality standards for $PM_{2.5}$.

The major subgroups of the population that appear to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary or cardiovascular disease or influenza, asthmatics, the elderly and children. Particulate matter also impacts soils and damages materials and is a major cause of visibility impairment.

Numerous studies have linked PM exposure to premature death in people with preexisting heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms. Studies show that every 1 microgram per cubic meter reduction in $PM_{2.5}$ results in a one percent reduction in mortality rate for individuals over 30 years old (Bay Area Air Quality Management District, 2017). Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function and the development of chronic bronchitis – and even premature death. Additionally, depending on its composition, both PM_{10} and $PM_{2.5}$ can also affect water quality and acidity, deplete soil nutrients, damage sensitive forests and crops, affect ecosystem diversity, and contribute to acid rain (U.S. EPA, 2019c).

Lead (Pb) exposure can occur through multiple pathways, including inhalation of air and ingestion of Pb in food, water, soil or dust. Once taken into the body, lead distributes throughout the body in the blood and is accumulated in the bones. Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems and the cardiovascular system. Lead exposure also affects the oxygen carrying capacity of the blood. Excessive Pb exposure can cause seizures, mental retardation and/or behavioral disorders. Low doses of Pb can lead to central nervous system damage. Recent studies have also shown that Pb may be a factor in high blood pressure and subsequent heart disease.

Lead is persistent in the environment and can be added to soils and sediments through deposition from sources of lead air pollution. Other sources of lead to ecosystems include direct discharge of waste streams to water bodies and mining. Elevated lead in the environment can result in decreased growth and reproductive rates in plants and animals, and neurological effects in vertebrates.

Lead exposure is typically associated with industrial sources; major sources of lead in the air are ore and metals processing and piston-engine aircraft operating on leaded aviation fuel. Other sources are waste incinerators, utilities, and lead-acid battery manufacturers. The highest air concentrations of lead are usually found near lead smelters. As a result of the U.S. EPA's regulatory efforts, including the removal of lead from motor vehicle gasoline, levels of lead in the air decreased by 98 percent between 1980 and 2014 (U.S. EPA, 2019d). Based on this reduction of lead in the air over this period, and since most new developments do not generate an increase in lead exposure, the health impacts of ambient lead levels are not typically monitored by the California Air Resources Board (CARB).

AMBIENT AIR QUALITY STANDARDS

Both the U.S. EPA and the CARB have established ambient air quality standards for common pollutants. These ambient air quality standards represent safe levels of contaminants that avoid specific adverse health effects associated with each pollutant.

The federal and State ambient air quality standards are summarized in Table 2-1 for important pollutants. The federal and State ambient standards were developed independently, although both processes attempted to avoid health-related effects. As a result, the federal and State standards differ in some cases. In general, the California standards are more stringent. This is particularly true for ozone, $PM_{2.5}$, and PM_{10}. The U.S. EPA signed a final rule for the federal ozone eight-hour standard of 0.070 ppm on October 1, 2015, and was effective as of December 28, 2015 (equivalent to the California state ambient air quality eight-hour standard for ozone).

TABLE 2-1: FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

POLLUTANT	*AVERAGING TIME*	*FEDERAL PRIMARY STANDARD*	*STATE STANDARD*
Ozone	1-Hour 8-Hour	-- 0.070 ppm	0.09 ppm 0.070 ppm
Carbon Monoxide	8-Hour 1-Hour	9.0 ppm 35.0 ppm	9.0 ppm 20.0 ppm
Nitrogen Dioxide	Annual 1-Hour	0.053 ppm 0.100 ppm	0.03 ppm 0.18 ppm
Sulfur Dioxide	Annual 24-Hour 1-Hour	0.03 ppm 0.14 ppm 0.075 ppm	-- 0.04 ppm 0.25 ppm
PM_{10}	Annual 24-Hour	-- 150 ug/m^3	20 ug/m^3 50 ug/m^3
$PM_{2.5}$	Annual 24-Hour	12 ug/m^3 35 ug/m^3	12 ug/m^3 --
Lead	30-Day Avg. 3-Month Avg.	-- 0.15 ug/m^3	1.5 ug/m^3 --

NOTES: PPM = PARTS PER MILLION, UG/M3 = MICROGRAMS PER CUBIC METER
SOURCE: CALIFORNIA AIR RESOURCES BOARD, 2021A.

In 1997, new national standards for fine particulate matter diameter 2.5 microns or less ($PM_{2.5}$) were adopted for 24-hour and annual averaging periods. The existing PM_{10} standards were retained, but the method and form for determining compliance with the standards were revised.

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation, and monitoring of TACs is relatively recent compared to that for criteria pollutants. Unlike criteria pollutants, TACs are regulated on the basis of risk rather than specification of safe levels of contamination.

Existing air quality concerns within the County and the entire air basin are related to increases of regional criteria air pollutants (e.g., ozone and particulate matter), exposure to toxic air contaminants, odors, and increases in greenhouse gas emissions contributing to climate change. The primary source of ozone (smog) pollution is motor vehicles which account for 70 percent of the ozone in the region. Particulate matter is caused by dust, primarily dust generated from construction and grading activities, and smoke which is emitted from fireplaces, wood-burning stoves, and agricultural burning.

Attainment Status

In accordance with the California Clean Air Act (CCAA), the CARB is required to designate areas of the State as attainment, nonattainment, or unclassified with respect to applicable standards. An "attainment" designation for an area signifies that pollutant concentrations did not violate the applicable standard in that area. A "nonattainment" designation indicates that a pollutant concentration violated the applicable standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria.

Depending on the frequency and severity of pollutants exceeding applicable standards, the nonattainment designation can be further classified as serious nonattainment, severe nonattainment, or extreme nonattainment, with extreme nonattainment being the most severe of the classifications. An "unclassified" designation signifies that the data does not support either an attainment or nonattainment status. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The U.S. EPA designates areas for ozone, carbon monoxide, and nitrogen dioxide as "does not meet the primary standards," "cannot be classified," or "better than national standards." For sulfur dioxide, areas are designated as "does not meet the primary standards," "does not meet the secondary standards," "cannot be classified," or "better than national standards." However, the CARB terminology of attainment, nonattainment, and unclassified is more frequently used.

The County has a State designation Attainment or Unclassified for all criteria pollutants except for ozone, PM_{10} and $PM_{2.5}$. Stanislaus County has a national designation of either Unclassified or Attainment for all criteria pollutants except for Ozone and $PM_{2.5}$. Table 2-2 presents the state and nation attainment status for Stanislaus County.

TABLE 2-2: STATE AND NATIONAL ATTAINMENT STATUS IN STANISLAUS COUNTY

CRITERIA POLLUTANTS	*STATE DESIGNATIONS*	*NATIONAL DESIGNATIONS*
Ozone (O_3)	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Attainment
$PM_{2.5}$	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Attainment	Unclassified/Attainment
Nitrogen Dioxide (NO_2)	Attainment	Unclassified/Attainment
Sulfur Dioxide (SO_2)	Attainment	Unclassified/Attainment
Sulfates	Attainment	
Lead	Attainment	Unclassified/Attainment
Hydrogen Sulfide	Unclassified	
Visibility Reducing Particles	Unclassified	

SOURCE: CALIFORNIA AIR RESOURCES BOARD, 2021B.

Stanislaus County Air Quality Monitoring

The San Joaquin Valley Air Pollution District (SJVAPCD) and the CARB maintain air quality monitoring sites throughout Stanislaus County that collect data for ozone and $PM_{2.5}$. In addition, air quality monitoring sites for PM_{10} are located throughout the San Joaquin Valley (though not in Stanislaus County). It is important to note that while the State retains the one-hour standard, the federal ozone 1-hour standard was revoked by the U.S. EPA and is no longer applicable for federal standards. Best available data obtained from the monitoring sites between 2017 and 2020 (latest year of data available) is shown in Table 2-3, Table 2-4, and Table 2-5.

Table 2-3 Ambient Air Quality Monitoring Data Summary (Stanislaus County) - Ozone

Year	Days > Standard				1-Hour Observations			8-Hour Averages				Year Coverage	
	State		National			State	Nat'l	State		National			
	1-Hr	8-Hr	1-Hr	8-Hr	Max.	D.V.[1]	D.V.[2]	Max.	D.V.[1]	Max.	D.V.[2]	Min	Max
2020	4	14	0	14	0.104	0.10	0.101	0.087	0.088	0.086	0.080	96	99
2019	1	15	0	14	0.102	0.10	0.103	0.083	0.091	0.083	0.082	97	99
2018	7	30	0	27	0.108	0.10	0.103	0.096	0.091	0.095	0.084	99	99

Notes: All concentrations expressed in parts per million. The national 1-hour ozone standard was revoked in June 2005 and is no longer in effect. Statistics related to the revoked standard are shown in italics. D.V. [1]= State Designation Value. D.V. [2]= National Design Value.
Source: California Air Resources Board (Aerometric Data Analysis and Management System or iADAM) Air Pollution Summaries.

Table 2-4: Ambient Air Quality Monitoring Data Summary (San Joaquin Valley) – PM_{10}

Year	Est. Days > Std.		Annual Average		High 24-Hr Average		Year Coverage
	Nat'l	State	Nat'l	State	Nat'l	State	
2020	38.7	157.0	64.5	60.5	517.2	359.0	0 – 1002.40
2019	16.2	129.7	55.6	55.6	652.2	664.2	0 – 100
2018	9.6	164.4	54.5	53.0	250.2	250.4	0 – 100

Notes: The national annual average PM_{10} standard was revoked in December 2006 and is no longer in effect. An exceedance is not necessarily a violation. Statistics may include data that are related to an exceptional event. State and national statistics may differ for the following reasons: State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers. National statistics are based on standard conditions. State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria. ND=There was insufficient (or no) data available to determine the value.
Source: California Air Resources Board (Aerometric Data Analysis and Management System or iADAM) Air Pollution Summaries.

Table 2-5 Ambient Air Quality Monitoring Data Summary (Stanislaus County) - $PM_{2.5}$

Year	Est. Days > Nat'l '06 Std.	Annual Average		Nat'l Ann. Std. D.V.[1]	State Annual D.V.[2]	Nat'l '06 Std. 98th Percentile	Nat'l '06 24-Hr Std. D.V.[1]	High 24-Hour Average		Year Coverage	
		Nat'l	State					Nat'l	State	Min	Max
2020	31.0	15.5	15.6	14.5	17	86.9	71	118.5	118.5	97	97
2019	8.3	10.6	10.6	13.5	17	36.0	60	40.7	40.7	92	98
2018	25.7	17.2	17.2	14.2	17	100.4	63	189.8	189.8	96	98

Notes: All concentrations expressed in parts per million. State and national statistics may differ for the following reasons: State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers. State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria. D.V. [1] = State Designation Value. D.V. [2]= National Design Value
Source: California Air Resources Board (Aerometric Data Analysis and Management System or iADAM) Air Pollution Summaries.

Odors

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another.

It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word “strong” to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air.

When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

SENSITIVE RECEPTORS

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardiorespiratory diseases. A sensitive receptor is a location where human populations, especially children, seniors, and sick persons, are present and where there is a reasonable expectation of continuous human exposure to pollutants. Examples of sensitive receptors include residences, hospitals, and schools. The closest sensitive receptors to the Project site include existing residences located within the Project site itself.

2.2 REGULATORY SETTING

FEDERAL

Clean Air Act

The Federal Clean Air Act (FCAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The FCAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: NAAQS for criteria air pollutants, hazardous air pollutant standards, state attainment plans, motor vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The U.S. EPA is responsible for administering the FCAA. The FCAA requires the U.S. EPA to set NAAQS for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health (with an adequate margin of safety, including for sensitive populations such as children, the elderly, and individuals suffering from respiratory diseases), and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction.

NAAQS standards define clean air and represent the maximum amount of pollution that can be present in outdoor air without any harmful effects on people and the environment. Existing violations of the ozone and $PM_{2.5}$ ambient air quality standards indicate that certain individuals exposed to these pollutants may experience certain health effects, including increased incidence of cardiovascular and respiratory ailments.

NAAQS standards have been designed to accurately reflect the latest scientific knowledge and are reviewed every five years by a Clean Air Scientific Advisory Committee (CASAC), consisting of seven members appointed by the U.S. EPA Administrator. Reviewing NAAQS is a lengthy undertaking and includes the following major phases: Planning, Integrated Science Assessment (ISA), Risk/Exposure Assessment (REA), Policy Assessment (PA), and Rulemaking. The process starts with a comprehensive review of the relevant scientific literature. The literature is summarized and conclusions are presented in the ISA. Based on the ISA, U.S. EPA staff perform a risk and exposure assessment, which is summarized in the REA document. The third document, the PA, integrates the findings and conclusions of the ISA and REA into a policy context, and provides lines of reasoning that could be used to support retention or revision of the existing NAAQS, as well as several alternative standards that could be supported by the review findings. Each of these three documents are released for public comment and public peer review by the CASAC. Members of CASAC are appointed by the U.S. EPA Administrator for their expertise in one or more of the subject areas covered in the ISA. The CASAC's role is to peer review the NAAQS documents, ensure that they reflect the thinking of the scientific community, and advise the Administrator on the technical and scientific aspects of standard setting. Each document goes through two to three drafts before CASAC deems it to be final.

Although there is some variability among the health effects of the NAAQS pollutants, each has been linked to multiple adverse health effects including, among others, premature death, hospitalizations and emergency department visits for exacerbated chronic disease, and increased symptoms such as coughing and wheezing. NAAQS standards were last revised for each of the six criteria pollutant as listed below, with detail on what aspects of NAAQS changed during the most recent update:

- Ozone: On October 1, 2015, the U.S. EPA lowered the national eight-hour standard from 0.075 ppm to 0.070 ppm, providing for a more stringent standards consistent with the current California state standard.
- CO: In 2011, the primary standards were retained from the original 1971 level, without revision. The secondary standards were revoked in 1985.
- NO_2: The national NO_2 standard was most recently revised in 2010 following an exhaustive review of new literature pointed to evidence for adverse effects in asthmatics at lower NO_2 concentrations than the existing national standard.

- SO_2: On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb.
- PM: the national annual average $PM_{2.5}$ standard was most recently revised in 2012 following an exhaustive review of new literature pointed to evidence for increased risk of premature mortality at lower $PM_{2.5}$ concentrations than the existing standard.
- Lead: The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. In 2016, the primary and secondary standards were retained.

The law recognizes the importance for each state to locally carry out the requirements of the FCAA, as special consideration of local industries, geography, housing patterns, etc. are needed to have full comprehension of the local pollution control problems. As a result, the U.S. EPA requires each state to develop a State Implementation Plan (SIP) that explains how each state will implement the FCAA within their jurisdiction. A SIP is a collection of rules and regulations that a particular state will implement to control air quality within their jurisdiction. The CARB is the state agency that is responsible for preparing the California SIP.

Transportation Conformity

Transportation conformity requirements were added to the FCAA in the 1990 amendments, and the U.S. EPA adopted implementing regulations in 1997. See §176 of the FCAA (42 U.S.C. §7506) and 40 CFR Part 93, Subpart A. Transportation conformity serves much the same purpose as general conformity: it ensures that transportation plans, transportation improvement programs, and projects that are developed, funded, or approved by the United States Department of Transportation or that are recipients of funds under the Federal Transit Act or from the Federal Highway Administration (FHWA), conform to the SIP as approved or promulgated by U.S. EPA.

Currently, transportation conformity applies in nonattainment areas and maintenance areas. Under transportation conformity, a determination of conformity with the applicable SIP must be made by the agency responsible for the proposed Project, such as the Metropolitan Planning Organization, the Council of Governments, or a federal agency. The agency making the determination is also responsible for all the requirements relating to public participation. Generally, a project will be considered in conformance if it is in the transportation improvement plan and the transportation improvement plan is incorporated in the SIP. If an action is covered under transportation conformity, it does not need to be separately evaluated under general conformity.

Transportation Control Measures

One particular aspect of the SIP development process is the consideration of potential control measures as a part of making progress towards clean air goals. While most SIP control measures are aimed at reducing emissions from stationary sources, some are typically created to address mobile or transportation sources. These are known as transportation control measures (TCMs). TCM strategies are designed to reduce vehicle miles traveled and trips, or vehicle idling and associated air pollution. These goals are achieved by developing attractive and convenient alternatives to single-occupant vehicle use.

Examples of TCMs include ridesharing programs, transportation infrastructure improvements such as adding bicycle and carpool lanes, and expansion of public transit.

STATE

CARB Mobile-Source Regulation

The State of California is responsible for controlling emissions from the operation of motor vehicles in the State. Rather than mandating the use of specific technology or the reliance on a specific fuel, the CARB motor vehicle standards specify the allowable grams of pollution per mile driven. In other words, the regulations focus on the reductions needed rather than on the manner in which they are achieved. Towards this end, the CARB has adopted regulations which require auto manufacturers to phase in less polluting vehicles.

California Clean Air Act

The California Clean Air Act (CCAA) was first signed into law in 1988. The CCAA provides a comprehensive framework for air quality planning and regulation, and spells out, in statute, the state's air quality goals, planning and regulatory strategies, and performance. The CARB is the agency responsible for administering the CCAA. The CARB established ambient air quality standards pursuant to the California Health and Safety Code (CH&SC) [§39606(b)], which are similar to the federal standards.

California Air Quality Standards

Although NAAQS are determined by the U.S. EPA, states have the ability to set standards that are more stringent than the federal standards. As such, California established more stringent ambient air quality standards. Federal and state ambient air quality standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulates and lead. In addition, California has created standards for pollutants that are not covered by federal standards. Although there is some variability among the health effects of the CAAQS pollutants, each has been linked to multiple adverse health effects including, among others, premature death, hospitalizations and emergency department visits for exacerbated chronic disease, and increased symptoms such as coughing and wheezing. The existing state and federal primary standards for major pollutants are shown in Table 2-1.

Air quality standard setting in California commences with a critical review of all relevant peer reviewed scientific literature. The Office of Environmental Health Hazard Assessment (OEHHA) uses the review of health literature to develop a recommendation for the standard. The recommendation can be for no change, or can recommend a new standard. The review, including the OEHHA recommendation, is summarized in a document called the draft Initial Statement of Reasons (ISOR), which is released for comment by the public, and also for public peer review by the Air Quality Advisory Committee (AQAC). AQAC members are appointed by the President of the University of California for their expertise in the range of subjects covered in the ISOR, including health, exposure, air quality monitoring, atmospheric chemistry and physics, and effects on plants, trees, materials, and ecosystems. The Committee provides written comments on the draft ISOR. The ARB staff next revises the ISOR based on comments from AQAC and the public. The revised ISOR is then released for a 45-day public comment period prior to consideration by the Board at a regularly scheduled Board hearing.

In June of 2002, the CARB adopted revisions to the PM_{10} standard and established a new $PM_{2.5}$ annual standard. The new standards became effective in June 2003. Subsequently, staff reviewed the published scientific literature on ground-level ozone and nitrogen dioxide and the CARB adopted revisions to the standards for these two pollutants. Revised standards for ozone and nitrogen dioxide went into effect on May 17, 2006 and March 20, 2008, respectively. These revisions reflect the most recent changes to the CAAQS.

Tanner Air Toxics Act (TACs)

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). The Tanner Act 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. To date, CARB has identified more than 21 TACs and has adopted U.S. EPA's list of HAPs as TACs. Most recently, diesel PM was added to the CARB list of TACs. Once a TAC is identified, CARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate Best Available Control Technologies (BACT) to minimize emissions.

AB 2588 requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures. CARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators). In February 2000, CARB adopted a new public-transit bus-fleet rule and emission standards for new urban buses. These rules and standards provide for (1) more stringent emission standards for some new urban bus engines, beginning with 2002 model year engines; (2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and (3) reporting requirements under which transit agencies must demonstrate compliance with the urban transit bus fleet rule.

Omnibus Low-NOx Rule

The CARB approved the Omnibus Low-NOx Rule on August 28, 2020, which will require engine NOx emissions to be cut to approximately 75% below current standards beginning in 2024, and 90% below current standards in 2027. The rule also places nine additional regulatory requirements on new heavy-duty truck and engines. Those additional requirements include a 50% reduction in particulate matter emissions, stringent new low-load and idle standards, a new in-use testing protocol, extended deterioration requirements, a new California-only credit program, and extended mandatory warranty requirements. The regulatory requirements in the Omnibus Low-NOX Rule will first become effective in 2024, at the same time as the Advanced Clean Trucks regulations that CARB approved that mandates manufacturers convert increasing percentages of their heavy-duty trucks sold in California to zero-emission vehicles.

Assembly Bill 170

Assembly Bill 170, Reyes (AB 170), was adopted by state lawmakers in 2003, creating Government Code Section 65302.1, which requires cities and counties in the San Joaquin Valley to amend their general plans to include data and analysis, comprehensive goals, policies, and feasible implementation strategies designed to improve air quality. The elements to be amended include, but are not limited to, those elements dealing with land use, circulation, housing, conservation, and open space. Section 65302.1.c identifies four areas of air quality discussion required in these amendments:

- A report describing local air quality conditions, attainment status, and state and federal air quality and transportation plans;
- A summary of local, district, state, and federal policies, programs, and regulations to improve air quality;
- A comprehensive set of goals, policies, and objectives to improve air quality; and
- Feasible implementation measures designed to achieve these goals.

LOCAL

San Joaquin Valley Air Pollution Control District

The primary role of SJVAPCD is to develop plans and implement control measures in the SJVAB to control air pollution. These controls primarily affect stationary sources such as industry and power plants. Rules and regulations have been developed by SJVAPCD to control air pollution from a wide range of air pollution sources. SJVAPCD also provides uniform procedures for assessing potential air quality impacts of proposed projects and for preparing the air quality section of environmental documents.

AIR QUALITY PLANNING

The U.S. EPA requires states that have areas that do not meet the National AAQS to prepare and submit air quality plans showing how the National AAQS will be met. If the states cannot show how the National AAQS will be met, then the states must show progress toward meeting the National AAQS. These plans are referred to as the State Implementation Plans (SIP). California's adopted 2007 State Strategy was submitted to the U.S. EPA as a revision to its SIP in November 2007.[2] More recently, in October 2018, the CARB adopted the 2018 Updates to the California State Implementation Plan.

In addition, the CARB requires regions that do not meet California AAQS for ozone to submit clean air plans (CAPs) that describe measures to attain the standard or show progress toward attainment. To ensure federal CAA compliance, SJVAPCD is currently developing plans for meeting new National AAQS for ozone and $PM_{2.5}$ and the California AAQS for PM_{10} in the SJVAB (for California CAA compliance)[3] The following describes the air plans prepared by the SJVAPCD, which are incorporated by reference per CEQA Guidelines Section 15150.

[2] Note that the plan was adopted by CARB on September 27, 2007; California Air Resources Board. 2007. California Air Resources Board's Proposed State Strategy for California's 2007 State Implementation Plan.
[3] SJVAPCD, 2012. 2012 $PM_{2.5}$ Plan.

1-HOUR OZONE PLAN

Although U.S. EPA revoked its 1979 1-hour ozone standard in June 2005, many planning requirements remain in place, and SJVAPCD must still attain this standard before it can rescind CAA Section 185 fees. The SJVAPCD's most recent 1-hour ozone plan, the 2013 Plan for the Revoked 1-hour Ozone Standard, demonstrated attainment of the 1-hour ozone standard by 2017. However, on July 18, 2016, the U.S. EPA published in the Federal Register a final action determining that SJVAB has attained the 1-hour ozone NAAQS based on the 2012 to 2014 three-year period allowing nonattainment penalties to be lifted under federal Clean Air Act section 179b (SJVAPCD, 2015).

8-HOUR OZONE PLAN

The SJVAPCD's Governing Board adopted the 2007 Ozone Plan on April 30, 2007. This far-reaching plan, with innovative measures and a "dual path" strategy, assures expeditious attainment of the federal 8-hour ozone standard as set by U.S. EPA in 1997. The plan projects that the valley will achieve the 8-hour ozone standard for all areas of the SJVAB no later than 2023. The CARB approved the plan on June 14, 2007. The U.S. EPA approved the 2007 Ozone Plan effective April 30, 2012. SJVAPCD adopted the 2016 Ozone Plan to address the federal 2008 8-hour ozone standard, which must be attained by end of 2031.[4,5]

PM_{10} PLAN

Based on PM_{10} measurements from 2003 to 2006, the U.S. EPA found that the SJVAB has reached federal PM_{10} standards. On September 21, 2007, the SJVAPCD's Governing Board adopted the 2007 PM_{10} Maintenance Plan and Request for Redesignation. This plan demonstrates that the valley will continue to meet the PM_{10} standard. U.S. EPA approved the document and on September 25, 2008, the SJVAB was redesignated to attainment/maintenance (SJVAPCD, 2015).

PM2.5 PLAN

The SJVAPCD adopted the 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards on November 15, 2018.[6] This plan addresses the U.S. EPA federal 1997 annual $PM_{2.5}$ standard of 15 µg/m³ and 24-hour $PM_{2.5}$ standard of 65 µg/m³; the 2006 24-hour $PM_{2.5}$ standard of 35 µg/m³; and the 2012 annual $PM_{2.5}$ standard of 12 µg/m³. This plan demonstrates attainment of the federal $PM_{2.5}$ standards as expeditiously as practicable (SJVAPCD, 2020).

All of the above-referenced plans include measures (i.e., federal, state, and local) that would be implemented through rule making or program funding to reduce air pollutant emissions in the SJVAB. Transportation control measures are part of these plans.

---

[4] SJVAPCD. Ozone Plans. http://www.valleyair.org/ Air_Quality_Plans/Ozone_Plans.htm, accessed December 3, 2021.

[5] SJVAPCD. 2016 Plan for the 2008 8-Hour Ozone Standard, http://www.valleyair.org/Air_Quality_Plans/Ozone-Plan-2016.htm, accessed December 3, 2021.

[6] SJVAPCD. Particulate Matter Plans. http://valleyair.org/Air_Quality_Plans/PM_Plans.htm, accessed March 9, 2020.

SJVAPCD RULES AND REGULATIONS

SJVAPCD Indirect Source Review

On December 15, 2005, SJVAPCD adopted the Indirect Source Review Rule (ISR or Rule 9510) to reduce ozone precursors (i.e., ROG and NOx) and PM_{10} emissions from new land use development projects. Specifically, Rule 9510 targets the indirect emissions from vehicles and construction equipment associated with these projects and applies to both construction and operational-related impacts. The rule applies to any applicant that seeks to gain a final discretionary approval for a development project, or any portion thereof, which upon full buildout would include any one of the following:

- 50 residential units.
- 2,000 square feet of commercial space.
- 25,000 square feet of light industrial space.
- 100,000 square feet of heavy industrial space.
- 20,000 square feet of medical office space.
- 39,000 square feet of general office space.
- 9,000 square feet of educational space.
- 10,000 square feet of government space.
- 20,000 square feet of recreational space.
- 9,000 square feet of space not identified above.
- Transportation/transit projects with construction exhaust emissions of two or more tons of NOx or two or more tons of PM_{10}.
- Residential projects on contiguous or adjacent property under common ownership of a single entity in whole or in part, that is designated and zoned for the same development density and land use, regardless of the number of tract maps, and has the capability of accommodating more than 50 residential units.
- Nonresidential projects on contiguous or adjacent property under common ownership of a single entity in whole or in part, that is designated and zoned for the same development density and land use, and has the capability of accommodating development projects that emit two or more tons per year of NOx or PM_{10} during project operations.

The rule requires all subject, nonexempt projects to mitigate both construction and operational period emissions by (1) applying feasible SJVAPCD-approved mitigation measures, or (2) paying any applicable fees to support programs that reduce emissions. Off-site emissions reduction fees (off-site fee) are required for projects that do not achieve the required emissions reductions through on-site emission reduction measures. Phased projects can defer payment of fees in accordance with an Off-site Emissions Reduction Fee Deferral Schedule (FDS) approved by the SJVAPCD.

To determine how an individual project would satisfy Rule 9510, each project would submit an air quality impact assessment (AIA) to the SJVAPCD as early as possible, but no later than prior to the project's final discretionary approval, to identify the project's baseline unmitigated emissions inventory for indirect sources: on-site exhaust emissions from construction activities and operational activities from mobile and area sources of emissions (excludes fugitive dust and permitted sources).28 Rule 9510 requires the following reductions, which are levels that the SJVAPCD has identified as necessary, based on their air quality management plans, to reach attainment for ozone and particulate matter:

Construction Equipment Emissions

The exhaust emissions for construction equipment greater than 50 horsepower (hp) used or associated with the development project shall be reduced by the following amounts from the statewide average as estimated by CARB:

- 20 percent of the total NOx emissions
- 45 percent of the total PM_{10} exhaust emissions

Mitigation measures may include those that reduce construction emissions on-site by using less polluting construction equipment, which can be achieved by utilizing add-on controls, cleaner fuels, or newer, lower emitting equipment.

Operational Emissions

- NOx Emissions. Applicants shall reduce 33.3 percent of the project's operational baseline NOx emissions over a period of 10 years as quantified in the approved AIA.
- PM_{10} Emissions. Applicants shall reduce of 50 percent of the project's operational baseline PM_{10} emissions over a period of 10 years as quantified in the approved AIA.

These requirements listed above can be met through any combination of on-site emission reduction measures. In the event that a project cannot achieve the above standards through imposition of mitigation measures, then the project would be required to pay the applicable off-site fees. These fees are used to fund various incentive programs that cover the purchase of new equipment, engine retrofit, and education and outreach.

Fugitive PM_{10} Prohibitions

SJVAPCD controls fugitive PM_{10} through Regulation VIII, Fugitive PM_{10} Prohibitions. The purpose of this regulation is to reduce ambient concentrations of PM_{10} and $PM_{2.5}$ by requiring actions to prevent, reduce, or mitigate anthropogenic (human caused) fugitive dust emissions.

- Regulation VIII, Rule 8021 applies to any construction, demolition, excavation, extraction, and other earthmoving activities, including, but not limited to, land clearing, grubbing, scraping, travel on-site, and travel on access roads to and from the site.
- Regulation VIII, Rule 8031 applies to the outdoor handling, storage, and transport of any bulk material.
- Regulation VIII, Rule 8041 applies to sites where carryout or trackout has occurred or may occur on paved roads or the paved shoulders of public roads.
- Regulation VIII, Rule 8051 applies to any open area having 0.5 acre or more within urban areas or 3.0 acres or more within rural areas, and contains at least 1,000 square feet of disturbed surface area.
- Regulation VIII, Rule 8061 applies to any new or existing public or private paved or unpaved road, road construction project, or road modification project.
- Regulation VIII, Rule 8071 applies to any unpaved vehicle/equipment traffic area.

- Regulation VIII, Rule 8081 applies to off-field agricultural sources.

Sources regulated are required to provide Dust Control Plans that meet the regulation requirements. Under Rule 8021, a Dust Control Plan is required for any residential project that will include 10 or more acres of disturbed surface area, a nonresidential project with 5 or more acres of disturbed surface area, or a project that relocates 2,500 cubic yards per day of bulk materials for at least three days. The Dust Control Plan is required to be submitted to SJVAPCD prior to the start of any construction activity. The Dust Control Plan must also describe fugitive dust control measure to be implemented before, during, and after any dust-generating activity. For sites smaller than those listed above, the project is still required to notify SJVAPCD a minimum of 48 hours prior to commencing earthmoving activities.

National Emission Standards for Hazardous Air Pollutants

Rule 4002 applies in the event an existing building will be renovated, partially demolished or removed (National Emission Standards for Hazardous Air Pollutants); this rule applies to all sources of Hazardous Air Pollutants.

Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations

If asphalt paving will be used, then paving operations of the proposed Project will be subject to Rule 4641. This rule applies to the manufacture and use of cutback asphalt, slow cure asphalt and emulsified asphalt for paving and maintenance operations.

Nuisance Odors

SJVAPCD controls nuisance odors through implementation of Rule 4102, Nuisance. Pursuant to this rule, "a person shall not discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health, or safety of any such person or the public or which cause or have a natural tendency to cause injury or damage to business or property."

Employer Based Trip Reduction Program

SJVAPCD has implemented Rule 9410, Employer Based Trip Reduction. The purpose of this rule is to reduce VMT from private vehicles used by employees to commute to and from their worksites to reduce emissions of NOx, ROG, and particulate matter (PM_{10} and $PM_{2.5}$). The rule applies to employers with at least 100 employees. Employers are required to implement an Employer Trip Reduction Implementation Plan (ETRIP) for each worksite with 100 or more eligible employees to meet applicable targets specified in the rule. Employers are required to facilitate the participation of the development of ETRIPs by providing information to its employees explaining the requirements and applicability of this rule. Employers are required to prepare and submit an ETRIP for each worksite to the District. The ETRIP must be updated annually. Under this rule, employers shall collect information on the modes of transportation used for each eligible employee's commutes both to and from work for every day of the commute verification period, as defined in using either the mandatory commute verification method or a representative survey method. Annual reporting includes the results of the commute verification for the previous calendar year along with the measures implemented as outlined in the ETRIP and, if necessary, any updates to the ETRIP.

2.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed Project will have a significant impact on the environment associated with air quality if it will:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; and/or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

CRITERIA POLLUTANT EMISSIONS MODELING

California Emission Estimator Model (CalEEMod)™ (v.2020.4.0), developed for the California Air Pollution Officers Association (CAPCOA) in collaboration with California air districts, was used to estimate emissions for the proposed Project. Project construction was assumed to begin in early 2022, and Project operation was assumed to begin in early 2023.

The assumptions for the modeling were selected on a best-fit basis, and are consistent with the information provided by the Project applicant The land uses modeled include: Single Family Housing – (69 dwelling units). Vehicle trip rates estimated in the modeling are consistent with the vehicle trips rates included in the modeling developed by Barrios Transportation Consulting in the *Transportation Impact Assessment*. The construction phase includes demolition, site preparation, grading, building construction, paving, and architectural coating phases. See Appendix A for further detail.

IMPACTS RELATED TO PROJECT-GENERATED POLLUTANTS OF HUMAN HEALTH CONCERN

In December 2018, the California Supreme Court issued its decision in *Sierra Club v. County of Fresno* (226 Cal.App.4th 704) (hereafter referred to as the Friant Ranch Decision). The case reviewed the long-term, regional air quality analysis contained in the EIR for the proposed Friant Ranch development. The Friant Ranch Project is a 942-acre master-plan development in unincorporated Fresno County within the San Joaquin Valley Air Basin. The Court found that the air quality analysis was inadequate because it failed to provide enough detail "for the public to translate the bare [criteria pollutant emissions] numbers provided into adverse health impacts or to understand why such a translation is not possible at this time." The Court's decision clarifies that the agencies authoring environmental documents must make reasonable efforts to connect a project's air quality impacts to specific health effects or explain why it is not technically feasible to perform such an analysis.

All criteria pollutants that would be generated by the Project are associated with some form of health risk (e.g., asthma). Criteria pollutants can be classified as either regional or localized pollutants. Regional pollutants can be transported over long distances and affect ambient air quality far from the emissions source. Localized pollutants affect ambient air quality near the emissions source. Ozone is considered a regional criteria pollutant, whereas CO, NO_2, SO_2, and lead (Pb) are localized pollutants. PM can be both a local and a regional pollutant, depending on its composition. As discussed above, the primary criteria pollutants of concern generated by the Project are ozone precursors (ROG and NO_x) and PM (including Diesel PM). The SJVAPCD does not currently have a methodology that would correlate the expected air quality emissions of Projects to the likely health consequences of the increased emissions.

Regional Project-Generated Criteria Pollutants (Ozone Precursors and Regional PM)

Adverse health effects induced by regional criteria pollutant emissions generated by the Project (ozone precursors and PM) are highly dependent on a multitude of interconnected variables (e.g., cumulative concentrations, local meteorology and atmospheric conditions, the number and character of exposed individuals [e.g., age, gender]). For these reasons, ozone precursors (ROG and NO_x) contribute to the formation of ground-borne ozone on a regional scale, where emissions of ROG and NO_x generated in one area may not equate to a specific ozone concentration in that same area. Similarly, some types of particulate pollutants may be transported over long-distances or formed through atmospheric reactions. As such, the magnitude and locations of specific health effects from exposure to increased ozone or regional PM concentrations are the product of emissions generated by numerous sources throughout a region, as opposed to a single individual project.

Models and tools have been developed to correlate regional criteria pollutant emissions to potential community health impacts. Appendix D contains a table that summarizes many of these tools, identifies the analyzed pollutants, describes their intended application and resolution, and analyzes whether they could be used to reasonably correlate project-level emissions to specific health consequences. As provided in Appendix D, while there are models capable of quantifying ozone and secondary PM formation and associated health effects, these tools were developed to support regional planning and policy analysis and have limited sensitivity to small changes in criteria pollutant concentrations induced by individual projects. Therefore, translating project generated criteria pollutants to the locations where specific health effects could occur or the resultant number of additional days of nonattainment cannot be estimated with a high degree of accuracy.

Technical limitations of existing models to correlate project-level regional emissions to specific health consequences are recognized by air quality management districts throughout the state, including the SJVAPCD and South Coast Air Quality Management District (SCAQMD), who provided amici curiae briefs for the Friant Ranch legal proceedings. In its brief, SJVAPCD (2015) acknowledges that while health risk assessments for localized air toxics, such as DPM, are commonly prepared, “it is not feasible to conduct a similar analysis for criteria air pollutants because currently available computer modeling tools are not equipped for this task.” The air district further notes that emissions solely from the Friant Ranch Project (which equate to less than one-tenth of one percent of the total NO_x and VOC in the Valley) is not likely to yield valid information,” and that any such information should not be “accurate when applied at the local level." SCAQMD presents similar information in their brief, stating that "it takes a large amount of additional precursor emissions to cause a modeled increase in ambient ozone levels"[7].

As discussed above, air districts develop region-specific CEQA thresholds of significance in consideration of existing air quality concentrations and attainment or nonattainment designations under the NAAQS and CAAQS. The NAAQS and CAAQS are informed by a wide range of scientific evidence that demonstrates there are known safe concentrations of criteria pollutants. While recognizing that air quality is cumulative problem, air districts typically consider projects that generate criteria pollutant and ozone precursor emissions below these thresholds to be minor in nature and would not adversely affect air quality such that the NAAQS or CAAQS would be exceeded. Emissions generated by the Project could increase photochemical reactions and the formation of tropospheric ozone and secondary PM, which at certain concentrations, could lead to increased incidence of specific health consequences. Although these health effects are associated with ozone and particulate pollution, the effects are a result of cumulative and regional emissions. As such, a project's incremental contribution cannot be traced to specific health outcomes on a regional scale without speculation, and a quantitative correlation of project-generated regional criteria pollutant emissions to specific human health impacts is not included in this analysis.

Models and Tools to Correlate Project-generated Criteria Pollutant Emissions to Health Impacts

Although available tools to correlate Project-generated criteria pollutant emissions to health impacts are designed to be used at the national, state, regional, and/or city-levels rather than the project level, this impact analysis includes CalEEMod modeling to identify criteria pollutant emissions that affect health. The higher the emissions generated by a project, the higher the chance that a given individual's health would be affected by the development of a particular project.

The impact analysis does not directly evaluate airborne lead. Neither construction nor future operations would generate quantifiable lead emissions because of regulations that require unleaded fuel and that prohibit lead in new building materials.

TAC emissions associated with Project construction that could affect surrounding areas are evaluated qualitatively. The proposed Project does not include any notable sources of TACs, including diesel particulate matter (DPM).

Lastly, the SJVPACD recommends that odor impacts be addressed in a qualitative manner. Such an analysis must determine if the Project would result in excessive nuisance odors, as defined under the SJVAPCD's Rule 4102 and California Code of Regulations, Health and Safety Code Section 41700, Air Quality Public Nuisance.

[7] For example, SCAQMD's analysis of their 2012 Air Quality Attainment Plan showed that modeled NO_x and ROG reductions of 432 and 187 tons per day, respectively, only reduced ozone levels by 9 parts per billion. Analysis of SCAQMD's Rule 1315 showed that emissions of NO_x and ROG of 6,620 and 89,180 pounds per day, respectively, contributed to 20 premature deaths per year and 89,947 school absence (South Coast Air Quality Management District, 2015).

IMPACTS AND MITIGATION MEASURES

Impact 2-1: Project operation would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment, or conflict or obstruct implementation of the District's air quality plan. (Less than Significant)

The SJVAPCD is tasked with implementing programs and regulations required by the Federal Clean Air Act and the California Clean Air Act. In that capacity, the SJVAPCD has prepared plans to attain Federal and State ambient air quality standards. To achieve attainment with the standards, the SJVAPCD has established thresholds of significance for criteria pollutant emissions in their *SJVAPCD Guidance for Assessing and Mitigating Air Quality Impacts* (2015). Projects with emissions below the thresholds of significance for criteria pollutants would be determined to "Not conflict or obstruct implementation of the District's air quality plan".

The proposed Project would be both a direct and indirect source of air pollution. Direct sources of pollution include area, energy, and water and waste sources, due to development of the on-site buildings and associated infrastructure. Indirect sources of pollution would be due to the generation of trips of from vehicles traveling to and from the Project site.

CalEEMod™ (v.2020.4.0) was used to model operational emissions of the proposed Project. Table 2-6 shows proposed Project unmitigated emissions, and Table 2-7 shows the proposed Project mitigated emissions, as provided by CalEEMod. The SJVAPCD provides a list of applicable air quality emissions thresholds.

TABLE 2-6: UNMITIGATED OPERATIONAL PROJECT GENERATED EMISSIONS (TONS PER YEAR)

POLLUTANT	CO	NOX	ROG	SOX	PM_{10}	$PM_{2.5}$
THRESHOLD	100	10	10	27	15	15
EMISSIONS	6.6	0.6	1.3	<0.1	1.3	0.8
EXCEEDS THRESHOLD?	N	N	N	N	N	N

SOURCES: CALEEMOD (V.2020.4.0)

TABLE 2-7: MITIGATED OPERATIONAL PROJECT GENERATED EMISSIONS (TONS PER YEAR)

POLLUTANT	CO	NOX	ROG	SOX	PM_{10}	$PM_{2.5}$
THRESHOLD	100	10	10	27	15	15
EMISSIONS	3.0	0.5	0.8	<0.1	0.6	0.2
EXCEEDS THRESHOLD?	N	N	N	N	N	N

SOURCES: CALEEMOD (V.2020.4.0)

The SJVAPCD has established their thresholds of significance by which the Project emissions are compared against to determine the level of significance. The SJVAPCD has established operations related emissions thresholds of significance as follows: 100 tons per year of carbon monoxide (CO, 10 tons per year of oxides of nitrogen (NO_x), 10 tons per year of reactive organic gases (ROG), 27 tons per year of sulfur oxides (SO_x), 15 tons per year particulate matter of 10 microns or less in size (PM_{10}), and 15 tons per year particulate matter of 2.5 microns or less in size ($PM_{2.5}$). If the proposed Project's emissions will exceed the SJVAPCD's threshold of significance for operational-generated emissions, the proposed Project will have a significant impact on air quality and all feasible mitigation are required to be implemented to reduce emissions to the extent feasible.

As shown in Table 2-6 and Table 2-7 above, operational emissions would not exceed the SJVACPD thresholds of significance. The mitigation measures incorporated into the modeling represent proposed Project characteristics, as follows:

- Improve Walkability Design: 7 intersections/square mile;
- Improve destination accessibility: 2.82 miles to the nearest job center;
- Develop the pedestrian network within the Project site;
- Provide traffic calming measures (at least 25% of Project streets and 25% of intersections).
- Provide school busing for 100% of families with students;
- No hearths;
- Ensure 3% of landscaping equipment utilized is electrically-powered; and
- Install solar panels on residences (consistent with state requirements).

It should be noted that the emissions of ozone precursors such as ROG and NO_x attributable to the proposed Project would not be substantial enough on a regional basis for Stanislaus County to be able, with currently available technical tools, to predict how the emissions of such pollutants would translate into either physical environmental changes, such as measurable effects on ambient ozone concentrations within the air basin, or health effects, such as increased respiratory problems, within any discrete population within Stanislaus County or the region. Such an analysis is not reasonably feasible within the meaning of CEQA because it would require a level of speculation.

PROJECT EFFECTS ON PUBLIC HEALTH

Stanislaus County has a state designation of Nonattainment for ozone, PM_{10} and $PM_{2.5}$. The SJVAPCD developed these Project-level thresholds based on the emissions that would exceed a CAAQS or contribute substantially to an existing or Projected violation of a CAAQS. Ambient levels of these criteria pollutants are likely to decrease in the future, based on current and future implementation of federal and/or state regulatory requirements, such as improvements to the statewide vehicle fleet over time (including the long-term replacement of internal combustion engine vehicles with electric vehicles in coming decades).

As shown in the table provided in Appendix D of this EIR, almost all tools available to measure criteria pollutant emissions were designed to be used at the national, state, regional, and/or city-levels. These tools are not well suited to analyze small or localized changes in pollutant concentrations associated with individual projects. Accordingly, they are not recommended by the SJVAPCD for CEQA analyses. Instead, the following analysis of health effects is presented qualitatively.

Ozone

O_3 is not emitted directly into the air but is formed through complex chemical reactions between precursor emissions of volatile organic compounds (VOC) (also known as ROG) and oxides of nitrogen (NO_x) in the presence of sunlight. The reactivity of O_3 causes health problems because it damages lung tissue, reduces lung function and sensitizes the lungs to other irritants. Scientific evidence indicates that ambient levels of O_3 not only affect people with impaired respiratory systems, such as asthmatics, but healthy adults and children as well. Exposure to O_3 for several hours at relatively low concentrations has been found to significantly reduce lung function and induce respiratory inflammation in normal, healthy people during exercise. This decrease in lung function generally is accompanied by symptoms including chest pain, coughing, sneezing and pulmonary congestion.

Studies show associations between short-term ozone exposure and non-accidental mortality, including deaths from respiratory issues. Studies also suggest long-term exposure to ozone may increase the risk of respiratory-related deaths (U.S. Environmental Protection Agency 2019a). The concentration of ozone at which health effects are observed depends on an individual's sensitivity, level of exertion (i.e., breathing rate), and duration of exposure. Studies show large individual differences in the intensity of symptomatic responses, with one study finding no symptoms to the least responsive individual after a 2-hour exposure to 400 parts per billion of ozone and a 50 percent decrement in forced airway volume in the most responsive individual. Although the results vary, evidence suggest that sensitive populations (e.g., asthmatics) may be affected on days when the 8-hour maximum ozone concentration reaches 80 parts per billion (U.S. Environmental Protection Agency 2019b).

The Project would generate emissions of ROG and NO_x during Project operational activities, as shown in Table 2-6 and Table 2-7. Although the exact effects of Project-level emissions on local health are not precisely known, it is likely that the increases in ROG and NO_x generated by the proposed Project would especially affect people with impaired respiratory systems, but also healthy adults and children located in the immediate vicinity of the Project site. However, the increases of these pollutants generated by the proposed Project are not on their own likely to generate an increase in the number of days exceeding the NAAQS or CAAQS standards, based on the size of the proposed Project in comparison to Stanislaus County as a whole. Instead, the increases in ROG and NO_x generated by the proposed Project when combined with the existing ROG and NO_x emitted regionally, would affect people, especially those with impaired respiratory systems located in the immediate vicinity of the Project site.

Particulate Matter

Based on studies of human populations exposed to high concentrations of particles (sometimes in the presence of SO_2) and laboratory studies of animals and humans, PM can cause major effects of concern for human health. These include effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis and premature death. Small particulate pollution has health impacts even at very low concentrations – indeed no threshold has been identified below which no damage to health is observed. The major subgroups of the population that appear to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary or cardiovascular disease or influenza, asthmatics, the elderly and children.

Numerous studies have linked PM exposure to premature death in people with preexisting heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms. Studies show that every 1 microgram per cubic meter reduction in $PM_{2.5}$ results in a one percent reduction in mortality rate for individuals over 30 years old (Bay Area Air Quality Management District, 2017). Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function and the development of chronic bronchitis – and even premature death. Additionally, depending on its composition, both PM_{10} and $PM_{2.5}$ can also affect water quality and acidity, deplete soil nutrients, damage sensitive forests and crops, affect ecosystem diversity, and contribute to acid rain (U.S. Environmental Protection Agency 2019c).

The Project would generate emissions of PM during Project operational activities, as shown in Table 2-6 and Table 2-7. Although the exact effects of such emissions on local health are not known, it is likely that the increases in PM generated by the proposed Project would especially affect people with impaired respiratory systems, but also healthy adults and children located in the immediate vicinity of the Project site. However, the increases of these pollutants generated by the proposed Project are not on their own likely to generate an increase in the number of days exceeding the NAAQS or CAAQS standards, based on the size of the Project in comparison the Stanislaus County as a whole. Instead, the increases in PM generated by the proposed Project when combined with the existing PM emitted regionally, would affect people, especially those with impaired respiratory systems located in the immediate vicinity of the Project site.

Discussion

The magnitude and locations of any potential changes in ambient air quality, and thus health consequences, from these additional emissions cannot be quantified with a high level of certainty due to the dynamic and complex nature of pollutant formation and distribution (e.g., meteorology, emissions sources, sunlight exposure), as well as the variabilities in the receptors that reside in a particular area. Additionally, SJVAPCD has not established any methodology or thresholds (quantitative or qualitative) for assessing the health effects from criteria pollutants. From a qualitative perspective, it is well documented from scientific studies that criteria pollutants can have adverse health effects. The federal and state governments have established the NAAQS or CAAQS as an attempt to regionally, and cumulatively, assess and control the health effects that criteria pollutants have within Air Basins. It is anticipated that public health will continue to be affected by the emission of criteria pollutants, especially by those with impaired respiratory systems Stanislaus County and the surrounding region so long as the region does not attain the CAAQS or NAAQS. However, the increases of these pollutants generated by the proposed Project are not on their own likely to generate an increase in the number of days exceeding the NAAQS or CAAQS standards, based on the size of the Project in comparison to the Stanislaus County as a whole. Instead, the increases in criteria pollutants generated by the proposed Project when combined with the existing criteria pollutants emitted regionally, would affect people, especially those with impaired respiratory systems located in the immediate vicinity of the Project site.

CONCLUSION

As shown in Table 2-6 and Table 2-7, the proposed Project's operational emissions would be below the SJVAPCD's significance thresholds for criteria pollutants. Therefore, the Project's criteria pollutant emissions would be considered to have a **less than significant** impact.

Impact 2-2: Proposed Project construction activities would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment, or conflict or obstruct implementation of the District's air quality plan. (Less than Significant)

Emissions from construction activities represent temporary impacts that are typically short in duration, depending on the size, phasing, and type of project. Air quality impacts can nevertheless be acute during construction periods, resulting in significant localized impacts to air quality. Construction-related activities would result in Project-generated emissions from demolition, site preparation, grading, paving, building construction, and architectural coatings. CalEEMod™ (v.2020.4.0) was used to estimate construction emissions for the proposed Project. Table 2-8, below, provides the mitigated construction criteria pollutant emissions associated with implementation of the proposed Project. It should be noted that the emissions are anticipated to be even lower than those shown in Table 2-8, as the Project would utilize a 'Construction Clean Fleet'.

TABLE 2-8: MAXIMUM CONSTRUCTION PROJECT GENERATED EMISSIONS (TONS PER YEAR) - MITIGATED

POLLUTANT	CO	NOX	ROG	SOX	PM_{10}	$PM_{2.5}$
THRESHOLD	100	10	10	27	15	15
EMISSIONS	2.1	2.3	1.2	<0.1	0.4	0.2
EXCEEDS THRESHOLD?	N	N	N	N	N	N

SOURCES: CALEEMOD (V.2020.40)

If the proposed Project's emissions will exceed the SJVAPCD's threshold of significance for construction-generated emissions, the proposed Project will have a significant impact on air quality and all feasible mitigation are required to be implemented to reduce emissions. As shown in Table 2-8, Project maximum construction emissions would not exceed the SJVAPCD thresholds of significance.

CONCLUSION

The proposed Project would comply with pre-existing requisite federal, State, SJVAPCD, and other local regulations and requirements, as well as implement the mitigation measures provided by the SJVAPCD for construction-related PM_{10} emissions. Therefore, the Project's criteria pollutant emissions would be considered to have a **less then significant** impact.

Impact 2-3: The proposed Project would not generate carbon monoxide hotspot impacts. (Less than Significant)

Very high levels of CO are not likely to occur outdoors. However, when CO levels are elevated outdoors, they can be of particular concern for people with some types of heart disease. These people already have a reduced ability for getting oxygenated blood to their hearts in situations where the heart needs more oxygen than usual. They are especially vulnerable to the effects of CO when exercising or under increased stress. In these situations, short-term exposure to elevated CO may result in reduced oxygen to the heart accompanied by chest pain also known as angina (U.S. EPA, 2016). Such acute effects may occur under current ambient conditions for some sensitive individuals, while increases in ambient CO levels could increase the risk of such incidences.

The Project site is located in a State attainment area and a federal attainment-unclassified area for carbon monoxide. In addition, CO emissions under Project operation are below the applicable significance threshold promulgated by the SJVAPCD. Therefore, no project-level conformity analysis is necessary for CO. Increases in proposed Project VMT would increase concentrations of carbon monoxide (CO) along streets and intersections that provide access to the Project site. Carbon monoxide is a local pollutant (i.e., high concentrations are normally only found very near sources), and can form local elevated concentrations under specific conditions. The major source of carbon monoxide, a colorless, odorless, poisonous gas, is automobile traffic. Elevated concentrations (i.e., hotspots), therefore, are usually only found near areas of very high traffic volume and congestion.

Several factors combine to make substantial concentrations of carbon monoxide unlikely. Existing physical constraints such as high-density, high-profile buildings or other obstructions that could prevent dispersion of carbon monoxide are largely absent. Predominant weather conditions in the area include air movement that would help facilitate carbon monoxide dispersion. Congested traffic conditions that otherwise could result in concentration of carbon monoxide would be of short duration. Further, under existing regulatory and legislative mandates, emissions volumes from all vehicles classes will continue to decline. Given these factors, substantial concentrations of carbon monoxide are not expected at or along any affected roadways or intersections.

CONCLUSION

This Project is located in an area that is designated attainment and attainment-unclassified for carbon monoxide. No Project-level conformity analysis is necessary for CO. Substantial concentrations of carbon monoxide are not expected at or along any streets or intersections affected by the development of the Project site. Impacts associated with carbon monoxide hotspots would be **less than significant**, and no additional mitigation is required.

Impact 2-4: The proposed Project has the potential for public exposure to toxic air contaminants. (Less than Significant)

A toxic air contaminant (TAC) is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air. However, their high toxicity or health risk may pose a threat to public health even at very low concentrations. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the state and federal governments have set ambient air quality standards.

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. EPA regulate 188 air toxics, also known as hazardous air pollutants. The U.S. EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources. In addition, the

U.S. EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment. These are acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter.

The 2007 U.S. EPA rule requires controls that will dramatically decrease Mobile Source Air Toxics (MSAT) emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (VMT) increases by 145 percent, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050. California maintains stricter standards for clean fuels and emissions compared to the national standards, therefore it is expected that MSAT trends in California will decrease consistent with or more than the U.S. EPA's national projections.

The California Air Resources Board (CARB) published the *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB, 2005) to provide information to local planners and decision-makers about land use compatibility issues associated with emissions from industrial, commercial and mobile sources of air pollution. The CARB Handbook indicates that mobile sources continue to be the largest overall contributors to the State's air pollution problems, representing the greatest air pollution health risk to most Californians. The most serious pollutants on a statewide basis include diesel exhaust particulate matter (diesel PM), benzene, and 1,3-butadiene, all of which are emitted by motor vehicles. These mobile source air toxics are largely associated with freeways and high traffic roads. Non-mobile source air toxics are largely associated with industrial and commercial uses. Table 2-9 provides the California Air Resources Board minimum separation recommendations on siting sensitive land uses.

TABLE 2-9: CARB MINIMUM SEPARATION RECOMMENDATIONS ON SITING SENSITIVE LAND USES

SOURCE CATEGORY	*ADVISORY RECOMMENDATIONS*
Freeways and High-Traffic Roads	• Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
Distribution Centers	• Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week). • Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points.
Rail Yards	• Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. • Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	• Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or the CARB on the status of pending analyses of health risks.
Refineries	• Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	• Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloro- ethylene	• Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more

	machines, consult with the local air district. • Do not site new sensitive land uses in the same building with perc dry cleaning operations.
Gasoline Dispensing Facilities	• Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50-foot separation is recommended for typical gas dispensing facilities.

SOURCES: AIR QUALITY AND LAND USE HANDBOOK: A COMMUNITY HEALTH PERSPECTIVE" (CARB 2005)

Residences are proposed as part of the Project, which are considered traditional sensitive receptors. However, the Project is located in an area within any of the CARB minimum separation recommendations for sensitive land uses, as provided in Table 2-9. Moreover, the proposed Project would not include any TACs, such as those that significant sources of generate diesel exhaust, that could impact nearby receptors. Therefore, implementation of the proposed Project would cause a **less than significant** impact relative to this topic.

Impact 2-5: The proposed Project would not cause exposure to other emissions (such as those leading to odors) adversely affecting a substantial number of people. (Less than Significant)

The following text addresses odors. Other emissions (including criteria pollutants and TACs) are addressed in Impacts 3.3-1 through 3.3-4.

While offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and the SJVAPCD. The general nuisance rule (Health and Safety Code §41700) is the basis for the threshold.

Examples of facilities that are known producers of odors include: Wastewater Treatment Facilities, Chemical Manufacturing, Sanitary Landfill, Fiberglass Manufacturing, Transfer Station, Painting/Coating Operations (e.g. auto body shops), Composting Facility, Food Processing Facility, Petroleum Refinery, Feed Lot/Dairy, Asphalt Batch Plant, and Rendering Plant.

If a project proposes to locate receptors and known odor sources in proximity to each other, further analysis may be warranted. However, if a project would not locate receptors and known odor sources in proximity to each other, then further analysis is not warranted. The proposed Project does not include new industrial uses that are not already present in the vicinity of the Project site. Air district Rule 402 prohibits any mobile or stationary source generating an objectionable odor, with the exception of odors emanating from certain agricultural operations. The California Health and Safety Code §41700 and Air District Rule 402 prohibit emissions of air contaminants from any source that cause nuisance or annoyance to a considerable number of people or that present a threat to public health or cause property damage. Compliance with these rules would preclude land uses proposed under the proposed Project from emitting objectionable odors.

CONCLUSION

The proposed Project does not propose sensitive receptors that would be exposed to odors in the vicinity; nor does it propose uses that would create new odors that would expose substantial numbers of people.

Therefore, operation of the proposed Project would not result in significant objectionable odors. Impacts associated with exposure to odors would be **less than significant.**

This section discusses regional greenhouse gas (GHG) emissions, climate change, and energy conservation impacts that could result from Project implementation. The analysis contained in this section is intended to be at a Project-level, and covers impacts associated with the conversion of the entire site to urban uses. This section provides a background discussion of greenhouse gases and climate change linkages and effects of global climate change. This section is organized with an existing setting, regulatory setting, approach/methodology, and impact analysis. The analysis and discussion of the GHG, climate change, and energy conservation impacts in this section focuses on the proposed Project's consistency with local, regional, and statewide climate change planning efforts and discusses the context of these planning efforts as they relate to the proposed Project. Disclosure and discussion of the Project's estimated energy usage and greenhouse gas emissions are provided.

3.1 Environmental Setting

Greenhouse Gases and Climate Change Linkages

Various gases in the Earth's atmosphere, classified as atmospheric GHGs, play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere from space, and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation.

Naturally occurring GHGs include water vapor (H_2O), carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and ozone (O_3). Several classes of halogenated substances that contain fluorine, chlorine, or bromine are also GHGs, but they are, for the most part, solely a product of industrial activities. Although the direct GHGs CO_2, CH_4, and N_2O occur naturally in the atmosphere, human activities have changed their atmospheric concentrations. From the pre-industrial era (i.e., ending about 1750) to 2011, concentrations of these three GHGs have increased globally by 40, 150, and 20 percent, respectively (IPCC, 2013).

GHGs, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), ozone (O_3), water vapor, nitrous oxide (N_2O), and chlorofluorocarbons (CFCs).

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. In California, the transportation sector is the largest emitter of GHGs, followed by the industrial and electricity generation sectors (California Energy Commission, 2020).

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California produced 440 million gross metric tons of carbon dioxide equivalents ($MMTCO_2e$) in 2016 (California Air Resources Board, 2018).

Carbon dioxide equivalents are a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential of a GHG, is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2017, accounting for 41% of total GHG emissions in the State. This category was followed by the industrial sector (24%), the electricity generation sector (including both in-state and out of-state sources) (15%), the agriculture sector (8%), the residential energy consumption sector (7%), and the commercial energy consumption sector (5%) (California Air Resources Board, 2020).

EFFECTS OF GLOBAL CLIMATE CHANGE

The effects of increasing global temperature are far-reaching and extremely difficult to quantify. The scientific community continues to study the effects of global climate change. In general, increases in the ambient global temperature as a result of increased GHGs are anticipated to result in rising sea levels, which could threaten coastal areas through accelerated coastal erosion, threats to levees and inland water systems and disruption to coastal wetlands and habitat.

If the temperature of the ocean warms, it is anticipated that the winter snow season would be shortened. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the State. The snowpack portion of the supply could potentially decline by 50% to 75% by the end of the 21^{st} century (National Resources Defense Council, 2014). This phenomenon could lead to significant challenges securing an adequate water supply for a growing state population. Further, the increased ocean temperature could result in increased moisture flux into the State; however, since this would likely increasingly come in the form of rain rather than snow in the high elevations, increased precipitation could lead to increased potential and severity of flood events, placing more pressure on California's levee/flood control system.

Sea level has risen approximately seven inches during the last century and it is predicted to rise an additional 22 to 35 inches by 2100, depending on the future GHG emissions levels (California Environmental Protection Agency, 2010). If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion and disruption of wetlands. As the existing climate throughout California changes over time, mass migration of species, or failure of species to migrate in time to adapt to the perturbations in climate, could also result. Under the emissions scenarios of the Climate Scenarios report (California Environmental Protection Agency, 2010), the impacts of global warming in California are anticipated to include, but are not limited to, the following.

Public Health

Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to ozone formation are projected to increase from 25% to 35% under the lower warming range and to 75% to 85% under the medium warming range. In addition, if global background ozone levels increase as predicted in some scenarios, it may become impossible to meet local air quality standards. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances depending on wind conditions. The Climate Scenarios report indicates that large wildfires could become up to 55% more frequent if GHG emissions are not significantly reduced.

In addition, under the higher warming scenario, there could be up to 100 more days per year with temperatures above 90°F in Los Angeles and 95°F in Sacramento by 2100. This is a large increase over historical patterns and approximately twice the increase projected if temperatures remain within or below the lower warming range. Rising temperatures will increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

Water Resources

A vast network of man-made reservoirs and aqueducts capture and transport water throughout the State from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada snow pack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snow pack, increasing the risk of summer water shortages.

The State's water supplies are also at risk from rising sea levels. An influx of saltwater would degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento/San Joaquin River Delta, a major State fresh water supply. Global warming is also projected to seriously affect agricultural areas, with California farmers projected to lose as much as 25% of the water supply they need; decrease the potential for hydropower production within the State (although the effects on hydropower are uncertain); and seriously harm winter tourism. Under the lower warming range, the snow dependent winter recreational season at lower elevations could be reduced by as much as one month. If temperatures reach the higher warming range and precipitation declines, there might be many years with insufficient snow for skiing, snowboarding, and other snow dependent recreational activities.

If GHG emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snow pack by as much as 70% to 90%. Under the lower warming scenario, snow pack losses are expected to be only half as large as those expected if temperatures were to rise to the higher warming range. How much snow pack will be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under the wetter climate projections, the loss of snow pack would pose challenges to water managers, hamper hydropower generation, and nearly eliminate all skiing and other snow-related recreational activities.

Agriculture

Increased GHG emissions are expected to cause widespread changes to the agriculture industry reducing the quantity and quality of agricultural products statewide. Although higher carbon dioxide levels can stimulate plant production and increase plant water-use efficiency, California's farmers will face greater water demand for crops and a less reliable water supply as temperatures rise.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than-optimal development for many crops, so rising temperatures are likely to worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits and nuts, and milk.

Crop growth and development will be affected, as will the intensity and frequency of pest and disease outbreaks. Rising temperatures will likely aggravate ozone pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

In addition, continued global warming will likely shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion is expected in many species while range contractions are less likely in rapidly evolving species with significant populations already established. Should range contractions occur, it is likely that new or different weed species will fill the emerging gaps. Continued global warming is also likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

Forests and Landscapes

Global warming is expected to alter the distribution and character of natural vegetation thereby resulting in a possible increased risk of large of wildfires. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55%, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the State. For example, if precipitation increases as temperatures rise, wildfires in southern California are expected to increase by approximately 30% toward the end of the century. In contrast, precipitation decreases could increase wildfires in northern California by up to 90%.

Moreover, continued global warming will alter natural ecosystems and biological diversity within the State. For example, alpine and sub-alpine ecosystems are expected to decline by as much as 60% to 80% by the end of the century as a result of increasing temperatures. The productivity of the State's forests is also expected to decrease as a result of global warming.

Rising Sea Levels

Rising sea levels, more intense coastal storms, and warmer water temperatures will increasingly threaten the State's coastal regions. Under the higher warming scenario, sea level is anticipated to rise 22 to 35 inches by 2100. Elevations of this magnitude would inundate coastal areas with saltwater, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.

ENERGY CONSUMPTION

Energy in California is consumed from a wide variety of sources. Fossil fuels (including gasoline and diesel fuel, natural gas, and energy used to generate electricity) are most widely used form of energy in the State. However, renewable sources of energy (such as solar and wind) are growing in proportion to California's overall energy mix. A large driver of renewable sources of energy in California is the State's current Renewable Portfolio Standard (RPS), which requires the State to derive at least 33% of electricity generated from renewable resources by 2020, 60 percent by 2030, and to achieve zero-carbon emissions by 2045 (as passed in September 2018, under AB 100).

Overall, in 2018, California's per capita energy usage was ranked fourth-lowest in the nation (U.S. EIA, 2020b). California's per capita rate of energy usage has remained relatively constant since the 1970's. Many State regulations since the 1970's, including new building energy efficiency standards, vehicle fleet efficiency measures, as well as growing public awareness, have helped to keep per capita energy usage in the State in check.

The consumption of non-renewable energy (i.e. fossil fuels) associated with the operation of passenger, public transit, and commercial vehicles, results in GHG emissions that contribute to global climate change. Alternative fuels such as natural gas, ethanol, and electricity (unless derived from solar, wind, nuclear, or other energy sources that do not produce carbon emissions) also result in GHG emissions and contribute to global climate change.

Electricity Consumption

California relies on a regional power system composed of a diverse mix of natural gas, renewable, hydroelectric, and nuclear generation resources. In 2016, more than one-fourth of the electricity supply comes from facilities outside of the State. Much of the power delivered to California from states in the Pacific Northwest was generated by wind. States in the Southwest delivered power generated at coal-fired power plants, at natural gas-fired power plants, and from nuclear generating stations (U.S. EIA, 2020a). In 2016, approximately 50 percent of California's utility-scale net electricity generation was fueled by natural gas. In addition, about 25 percent of the State's utility-scale net electricity generation came from non-hydroelectric renewable technologies, such as solar, wind, geothermal, and biomass. Another 14 percent of the State's utility-scale net electricity generation came from hydroelectric generation, and nuclear energy powered an additional 11 percent. The amount of electricity generated from coal negligible (approximately 0.2 percent) (U.S. EIA, 2020a). The percentage of renewable resources as a proportion of California's overall energy portfolio is increasing over time, as directed by the State's Renewable Portfolio Standard (RPS).

According to the California Energy Commission (CEC), total statewide electricity consumption increased from 166,979 gigawatt-hours (GWh) in 1980 to 228,038 GWh in 1990, which is an estimated annual growth rate of 3.66 percent. The statewide electricity consumption in 1997 was 246,225 GWh, reflecting an annual growth rate of 1.14 percent between 1990 and 1997 (U.S. EIA, 2020b). Statewide consumption was 274,985 GWh in 2010, an annual growth rate of 0.9 percent between 1997 and 2010. In 2019, electricity consumption in Stanislaus County was 5,056 GWh (California Energy Commission, 2020).

Oil

The primary energy source for the United States is oil, which is refined to produce fuels like gasoline, diesel, and jet fuel. Oil is a finite, nonrenewable energy source. World consumption of petroleum products has grown steadily in the last several decades. As of 2016, world consumption of oil had reached 96 million barrels per day. The United States, with approximately five percent of the world's population, accounts for approximately 19 percent of world oil consumption, or approximately 18.6 million barrels per day (U.S. EIA, 2021). The transportation sector relies heavily on oil. In California, petroleum-based fuels currently provide approximately 96 percent of the State's transportation energy needs.

Natural Gas/Propane

The State produces approximately 12 percent of its natural gas, while obtaining 22 percent from Canada and 65 percent from the Rockies and the Southwest (California Energy Commission, 2012). In 2006, California produced 325.6 billion cubic feet of natural gas (California Energy Commission, 2012). In 2018, natural gas consumption in Stanislaus County was 199 million therms (California Energy Commission, 2020).

3.2 REGULATORY SETTING

FEDERAL

Clean Air Act

The Federal Clean Air Act (FCAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The FCAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: NAAQS for criteria air pollutants, hazardous air pollutant standards, State attainment plans, motor National Ambient Air Quality Standards (NAAQS) vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The EPA is responsible for administering the FCAA. The FCAA requires the EPA to set NAAQS for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health, and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction.

On April 2, 2007, in the court case of *Massachusetts et al. vs. the USEPA et al*. (549 U.S. 497), the U.S. Supreme Court found that GHGs are air pollutants covered by the federal Clean Air Act (42 USC Sections 7401-7671q). The Supreme Court held that the Administrator of the United States Environmental Protection Agency must determine whether or not emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the Administrator is required to follow the language of Section

202(a) of the Clean Air Act. On December 7, 2009, the Administrator signed two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed GHGs (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) in the atmosphere threaten the public health and welfare of current and future generations.

- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution, which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action was a prerequisite for implementing GHG emission standards for vehicles. In collaboration with the National Highway Traffic Safety Administration (NHTSA) and CARB, the USEPA developed emission standards for light-duty vehicles (2012-2025 model years), and heavy-duty vehicles (2014-2027 model years).

Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the U.S. would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the United States. Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the U.S. Department of Transportation (USDOT), is responsible for establishing additional vehicle standards and for revising existing standards.

Since 1990, the fuel economy standard for new passenger cars has been 27.5 mpg. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 mpg. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is determined on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the U.S. The Corporate Average Fuel Economy (CAFE) program, which is administered by the EPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the USDOT is authorized to assess penalties for noncompliance.

Energy Policy Act of 1992 (EPAct)

The Energy Policy Act of 1992 (EPAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, State, and local government and private fleets to purchase a percentage of light duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are included in EPAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs.

Energy Policy Act of 2005

The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the act provides for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for a clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

Federal Climate Change Policy

According to the EPA, "the United States government has established a comprehensive policy to address climate change" that includes slowing the growth of emissions; strengthening science, technology, and institutions; and enhancing international cooperation. To implement this policy, "the Federal government is using voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science." The EPA administers multiple programs that encourage voluntary GHG reductions, including "ENERGY STAR", "Climate Leaders", and Methane Voluntary Programs. However, as of this writing, there are no adopted federal plans, policies, regulations, or laws directly regulating GHG emissions.

Mandatory Greenhouse Gas Reporting Rule

In 2009, EPA issued a final rule for mandatory reporting of GHGs from large GHG emissions sources in the United States. In general, this national reporting requirement will provide EPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons or more of CO_2 per year. This publicly available data will allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost effective opportunities to reduce emissions in the future. Reporting is at the facility level, except that certain suppliers of fossil fuels and industrial GHGs along with vehicle and engine manufacturers will report at the corporate level. An estimated 85% of the total U.S. GHG emissions, from approximately 10,000 facilities, are covered by this final rule.

STATE

The California Legislature has enacted a series of statutes in recent years addressing the need to reduce GHG emissions all across the State. These statutes can be categorized into four broad categories: (i) statutes setting numerical statewide targets for GHG reductions, and authorizing CARB to enact regulations to achieve such targets; (ii) statutes setting separate targets for increasing the use of renewable energy for the generation of electricity throughout the State; (iii) statutes addressing the carbon intensity of vehicle fuels, which prompted the adoption of regulations by CARB; and (iv) statutes intended to facilitate land use planning consistent with statewide climate objectives. The discussion below will address each of these key sets of statutes, as well as CARB "Scoping Plans" intended to achieve GHG reductions under the first set of statutes and recent building code requirements intended to reduce energy consumption.

Statutes Setting Statewide GHG Reduction Targets

ASSEMBLY BILL 32 (GLOBAL WARMING SOLUTIONS ACT)

In 2006, the California State Legislature enacted the California Global Warming Solutions Act of 2006 (Health & Safety Code Section 38500 et seq.), also known as Assembly Bill (AB) 32 (Stats. 2006, ch. 488). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that was phased in starting in 2012. To effectively implement the cap, AB 32 directs the California Air Resources Board (CARB) to develop and implement regulations to reduce statewide GHG emissions from stationary sources.

SENATE BILL 32

SB 32 (Stats. 2016, ch. 249) added Section 38566 to the Health and Safety Code. It provides that "[i]n adopting rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions authorized by [Division 25.5 of the Health and Safety Code], [CARB] shall ensure that statewide greenhouse gas emissions are reduced to at least 40 percent below the statewide greenhouse gas emissions limit no later than December 31, 2030." In other words, SB 32 requires California, by 2030, to reduce its statewide GHG emissions so that they are 40 percent below those that occurred in 1990.

Between AB 32 (2006) and SB 32 (2016), the Legislature has codified some of the ambitious GHG reduction targets included within certain high-profile Executive Orders issued by the last two Governors. The 2020 statewide GHG reduction target in AB 32 was consistent with the second of three statewide emissions reduction targets set forth in former Governor Arnold Schwarzenegger's 2005 Executive Order known as S-3-05, which is expressly mentioned in AB 32. (See Health & Safety Code Section 38501, subd. (i).) That Executive Branch document included the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80 percent below 1990 levels. To meet the targets, the Governor directed several State agencies to cooperate in the development of a climate action plan. The Secretary of Cal-EPA leads the Climate Action Team, whose goal is to implement global warming emission reduction programs identified in the Climate Action Plan and to report on the progress made toward meeting the emission reduction targets established in the executive order.

In 2015, Governor Brown issued Executive Order, B-30-15, which created a "new interim statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 is established in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050." SB 32 codified this target.

In 2018, the Governor issued Executive Order B-55-18, which established a statewide goal to "achieve carbon neutrality as soon as possible, and no later than 2045, and maintain and achieve negative emissions thereafter." The order directs the CARB to work with other State agencies to identify and recommend measures to achieve those goals.

Notably, the Legislature has not yet set a 2045 or 2050 target in the manner done for 2020 and 2030 through AB 32 and SB 32, though references to a 2050 target can be found in statutes outside the Health and Safety Code. Senate Bill 350 (SB 350) (Stats. 2015, ch. 547) added to the Public Utilities Code language that essentially puts into statute the 2050 GHG reduction target already identified in Executive Order S-3-05, albeit in the limited context of new state policies (i) increasing the overall share of electricity that must be produced through renewable energy sources and (ii) directing certain State agencies to begin planning for the widespread electrification of the California vehicle fleet. Section 740.12(a)(1)(D) of the Public Utilities Code now states that "[t]he Legislature finds and declares [that] … [r]educing emissions of [GHGs] to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050 will require widespread transportation electrification." Furthermore, Section 740.12(b) now states that the California Public Utilities Commission (PUC), in consultation with CARB and the California Energy Commission (CEC), must "direct electrical corporations to file applications for programs and investments to accelerate widespread transportation electrification to reduce dependence on petroleum, meet air quality standards, … and reduce emissions of greenhouse gases to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050."

Statute Setting Target for the Use of Renewable Energy for the Generation of Electricity

CALIFORNIA RENEWABLES PORTFOLIO STANDARD

In 2002, the Legislature enacted Senate Bill 1078 (Stats. 2002, ch. 516), which established the Renewables Portfolio Standard program, requiring retail sellers of electricity, including electrical corporations, community choice aggregators, and electric service providers, to purchase a specified minimum percentage of electricity generated by eligible renewable energy resources such as wind, solar, geothermal, small hydroelectric, biomass, anaerobic digestion, and landfill gas. (See Pub. Utilities Code, Section 399.11 et seq. [subsequently amended].) The legislation set a target by which 20 percent of the State's electricity would be generated by renewable sources. (Pub. Utility Code, Section 399.11, subd. (a) [subsequently amended].) As described in the Legislative Counsel's Digest, Senate Bill 1078 required "[e]ach electrical corporation … to increase its total procurement of eligible renewable energy resources by at least one percent per year so that 20 percent of its retail sales are procured from eligible renewable energy resources. If an electrical corporation fails to procure sufficient eligible renewable energy resources in a given year to meet an annual target, the electrical corporation would be required to procure additional eligible renewable resources in subsequent years to compensate for the shortfall, if funds are made available as described. An electrical corporation with at least 20 percent of retail sales procured from eligible renewable energy resources in any year would not be required to increase its procurement in the following year."

In 2006, the Legislature enacted Senate Bill 107 (Stats. 2006, ch. 464), which modified the Renewables Portfolio Standard to require that at least 20 percent of electricity retail sales be served by renewable energy resources by year 2010. (Pub. Utility Code, Section 399.11, subd (a) [subsequently amended].)

Senate Bill X1-2 (Stats. 2011, 1st Ex. Sess., ch. 1) set even more aggressive statutory targets for renewable electricity, culminating in the requirement that 33 percent of the State's electricity come from renewables by 2020. This legislation applies to all electricity retailers in the State, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. All of these entities must meet renewable energy goals of 20 percent of retail sales from renewables by the end of 2013, 25 percent by the end of 2016, and 33 percent by the end of 2020. (See Pub. Utility Code, Section 399.11 et seq. [subsequently amended].)

SB 350, discussed above, increases the Renewable Portfolio Standard to require 50 percent of electricity generated to be from renewables by 2030. (Pub. Utility Code, Section 399.11, subd (a); see also Section 399.30, subd. (c)(2).) Of equal significance, Senate Bill 350 also embodies a policy encouraging a substantial increase in the use of electric vehicles. As noted earlier, Section 740.12(b) of the Public Utilities Code now states that the PUC, in consultation with CARB and the CEC, must "direct electrical corporations to file applications for programs and investments to accelerate widespread transportation electrification to reduce dependence on petroleum, meet air quality standards, … and reduce emissions of greenhouse gases to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050."

Executive Order, B-16-12, issued in 2012, embodied a similar vision of a future in which zero-emission vehicles (ZEV) will play a big part in helping the State meet its GHG reduction targets. Executive Order B-16-12 directed State government to accelerate the market for in California through fleet replacement and electric vehicle infrastructure. The Executive Order set the following targets:

- By 2015, all major cities in California will have adequate infrastructure and be "ZEV ready";
- By 2020, the State will have established adequate infrastructure to support 1 million ZEVs in California;
- By 2025, there will be 1.5 million ZEVs on the road in California; and
- By 2050, virtually all personal transportation in the State will be based on ZEVs, and GHG emissions from the transportation sector will be reduced by 80 percent below 1990 levels.

In 2018, Senate Bill 100 (Stats. 2018, ch. 312) revised the above-described deadlines and targets so that the State will have to achieve a 50% renewable resources target by December 31, 2026 (instead of by 2030) and achieve a 60% target by December 31, 2030. The legislation also establishes a State policy that eligible renewable energy resources and zero-carbon resources supply 100% of retail sales of electricity to California end-use customers and 100% of electricity procured to serve all State agencies by December 31, 2045.

In summary, California has set a statutory goal of requiring that, by the 2030, 60 percent of the electricity generated in California should be from renewable sources, with increased generation capacity intended to sufficiently allow the mass conversion of the statewide vehicle fleet from petroleum-fueled vehicles to electrical vehicles and/or other ZEVs. By 2045, all electricity must come from renewable resources and other carbon-free resources. Former Governor Brown had an even more ambitious goal for the State of achieving carbon neutrality as soon as possible and by no later than 2045. The Legislature is thus looking to California drivers to buy electric cars, powered by green energy, to help the State meet its aggressive statutory goal, created by SB 32, of reducing statewide GHG emissions by 2030 to 40 percent below 1990 levels. Another key prong to this strategy is to make petroleum-based fuels less carbon-intensive. A number of statutes in recent years have addressed that strategy. These are discussed immediately below.

Statutes and CARB Regulations Addressing the Carbon Intensity of Petroleum-based Transportation Fuels

ASSEMBLY BILL 1493, PAVLEY CLEAN CARS STANDARDS

In 2002, the Legislature enacted Assembly Bill 1493 ("Pavley Bill") (Stats. 2002, ch. 200), which directed the CARB to develop and adopt regulations that achieve the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty trucks beginning with model year 2009. (See Health and Safety Code Section 43018.5.) In September 2004, pursuant to this directive, CARB approved regulations to reduce GHG emissions from new motor vehicles beginning with the 2009 model year. These regulations created what are commonly known as the "Pavley standards." In September 2009, CARB adopted amendments to the Pavley standards to reduce GHG emissions from new motor vehicles through the 2016 model year. These regulations created are what are commonly known as the "Pavley II standards." (See California Code of Regulations, Title 13, Sections 1900, 1961, and 1961.1 et seq.)

In 2012, CARB adopted an Advanced Clean Cars (ACC) program aimed at reducing both smog-causing pollutants and GHG emissions for vehicles model years 2017-2025. This historic program, developed in coordination with the USEPA and NHTSA, combined the control of smog-causing (criteria) pollutants and GHG emissions into a single coordinated set of requirements for model years 2015 through 2025. The regulations focus on substantially increasing the number of plug-in hybrid cars and zero-emission vehicles in the vehicle fleet and on making fuels such as electricity and hydrogen readily available for these vehicle technologies. The components of the ACC program are the Low-Emission Vehicle (LEV) regulations that reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles, and the Zero-Emission Vehicle (ZEV) regulation, which requires manufacturers to produce an increasing number of pure ZEVs (meaning battery electric and fuel cell electric vehicles), with provisions to also produce plug-in hybrid electric vehicles in the 2018 through 2025 model years. (See California Code of Regulations, Title 13, Sections 1900, 1961, 1961.1, 1961.2, 1961.3, 1965, 1968.2, 1968.5, 1976, 1978, 2037, 2038, 2062, 2112, 2139, 2140, 2145, 2147, 2235, and 2317 et seq.)

It is expected that the Pavley standards will reduce GHG emissions from California passenger vehicles by about 34 percent below 2016 levels by 2025, all while improving fuel efficiency and reducing motorists' costs.

Cap and Trade Program

In 2011, CARB adopted the final Cap-and-Trade Program for California (See California Code of Regulations, Title 17, Sections 95801-96022.) The California cap-and-trade program creates a market-based system with an overall emissions limit for affected sectors. The program is intended to regulate more than 85 percent of California's emissions and staggers compliance requirements according to the following schedule: (1) electricity generation and large industrial sources (2012); (2) fuel combustion and transportation (2015).

According to 2012 CARB guidance, "[t]he Cap-and-Trade Program will reduce GHG emissions from major sources (covered entities) by setting a firm cap on statewide GHG emissions while employing market mechanisms to cost-effectively achieve the emission-reduction goals. The statewide cap for GHG emissions from major sources, which is measured in metric tons of carbon dioxide equivalent (MTCO2e), will commence in 2013 and decline over time, achieving GHG emission reductions throughout the program's duration. Each covered entity will be required to surrender one permit to emit (the majority of which will be allowances, entities are also allowed to use a limited number of CARB offset credits) for each ton of GHG emissions they emit. Some covered entities will be allocated some allowances and will be able to buy additional allowances at auction, purchase allowances from others, or purchase offset credits."

The guidance goes on to say that "[s]tarting in 2012, major GHG-emitting sources, such as electricity generation (including imports), and large stationary sources (e.g., refineries, cement production facilities, oil and gas production facilities, glass manufacturing facilities, and food processing plants) that emit more than 25,000 $MTCO_2e$ per year will have to comply with the Cap-and-Trade Program. The program expands in 2015 to include fuel distributors (natural gas and propane fuel providers and transportation fuel providers) to address emissions from transportation fuels, and from combustion of other fossil fuels not directly covered at large sources in the program's initial phase." In early April 2017, the Third District Court of Appeal upheld the lawfulness of the Cap-and-Trade program as a "fee" rather than a "tax." (See *California Chamber of Commerce et al. v. State Air Resources Board et al.* (2017) 10 Cal.App.5th 604.)

AB 398 (Stats. 2017, ch. 135) extended the life of the existing Cap and Trade Program through December 2030.

Statute Intended to Facilitate Land Use Planning Consistent with Statewide Climate Objectives

CALIFORNIA SENATE BILL 375 (SUSTAINABLE COMMUNITIES STRATEGY)

This 2008 legislation built on AB 32 by setting forth a mechanism for coordinating land use and transportation on a regional level for the purpose of reducing GHGs. The focus is to reduce miles traveled by passenger vehicles and light trucks. CARB is required to set GHG reduction targets for each metropolitan region for 2020 and 2035. Each of California's metropolitan planning organizations then prepares a sustainable communities strategy that demonstrates how the region will meet its GHG reduction target through integrated land use, housing, and transportation planning. Once adopted by the metropolitan planning organizations, the sustainable communities strategy is to be incorporated into that region's federally enforceable regional transportation plan. If a metropolitan planning organization is unable to meet the targets through the sustainable communities strategy, then an alternative planning strategy must be developed which demonstrates how targets could be achieved, even if meeting the targets is deemed to be infeasible.

Climate Change Scoping Plans

AB 32 SCOPING PLAN

In 2008, CARB adopted the Climate Change Scoping Plan, which contains the main strategies California will implement to achieve reduction of approximately 118 million metric tons (MMT) CO_2e, or approximately 22 percent from the State's projected 2020 emission level of 545 MMT of CO_2e under a business-as-usual scenario This is a reduction of 47 MMT CO_2e, or almost 10 percent, from 2008 emissions. CARB's original 2020 projection was 596 MMT CO_2e, but this revised 2020 projection takes into account the economic downturn that occurred in 2008. The Scoping Plan also includes CARB recommended GHG reductions for each emissions sector of the State GHG inventory. CARB estimates the largest reductions in GHG emissions would be by implementing the following measures and standards:

- improved emissions standards for light-duty vehicles (26.1 MMT CO_2e);
- the Low Carbon Fuel Standard (15.0 MMT CO_2e);
- energy efficiency measures in buildings and appliances (11.9 MMT CO_2e); and
- renewable portfolio and electricity standards for electricity production (23.4 MMT CO_2e).

In 2011, CARB adopted a Cap-and-Trade regulation. The Cap-and-Trade program covers major sources of GHG emissions in the State such as refineries, power plants, industrial facilities, and transportation fuels. The Cap-and-Trade program includes an enforceable emissions cap that will decline over time. The State distributes allowances, which are tradable permits, equal to the emissions allowed under the cap. Sources under the cap are required to surrender allowances and offsets equal to their emissions at the end of each compliance period. Enforceable compliance obligations started in 2013. The program applies to facilities that comprise 85 percent of the State's GHG emissions.

With regard to land use planning, the Scoping Plan expects that reductions of approximately 3.0 MMT CO_2e will be achieved through implementation of Senate Bill (SB) 375, which is discussed further below.

2014 SCOPING PLAN UPDATE

CARB revised and reapproved the Scoping Plan and prepared the First Update to the 2008 Scoping Plan in 2014 (2014 Scoping Plan). The 2014 Scoping Plan contains the main strategies California will implement to achieve a reduction of 80 MMT of CO_2e emissions, or approximately 16 percent, from the State's projected 2020 emission level of 507 MMT of CO_2e under the business-as-usual scenario defined in the 2014 Scoping Plan. The 2014 Scoping Plan also includes a breakdown of the amount of GHG reductions CARB recommends for each emissions sector of the State's GHG inventory. Several strategies to reduce GHG emissions are included: the Low Carbon Fuel Standard, the Pavley Rule, the ACC program, the Renewable Portfolio Standard, and the Sustainable Communities Strategy.

2017 SB 32 SCOPING PLAN

With the passage of SB 32, the Legislature also passed companion legislation AB 197, which provides additional direction for developing the scoping plan. In response, CARB adopted an updated Scoping Plan in December 2017. The document reflects the 2030 target of reducing statewide GHG emissions by 40 percent below 1990 levels codified by SB 32. The GHG reduction strategies in the plan that CARB will implement to meet the target include:

- SB 350 - achieve 50 percent Renewables Portfolio Standard (RPS) by 2030 and doubling of energy efficiency savings by 2030;
- Low Carbon Fuel Standard - increased stringency (reducing carbon intensity 18 percent by 2030, up from 10 percent in 2020);
- Mobile Source Strategy (Cleaner Technology and Fuels Scenario) - maintaining existing GHG standards for light- and heavy-duty vehicles, put 4.2 million zero-emission vehicles on the roads, and increase zero-emission buses, delivery and other trucks;
- Sustainable Freight Action Plan - improve freight system efficiency, maximize use of near-zero emission vehicles and equipment powered by renewable energy, and deploy over 100,000 zero-emission trucks and equipment by 2030;
- Short-Lived Climate Pollutant Reduction Strategy - reduce emissions of methane and hydrofluorocarbons 40 percent below 2013 levels by 2030 and reduce emissions of black carbon 50 percent below 2013 levels by 2030;
- SB 375 Sustainable Communities Strategies - increased stringency of 2035 targets;
- Post-2020 Cap-and-Trade Program - declining caps, continued linkage with Québec, and linkage to Ontario, Canada;
- 20 percent reduction in GHG emissions from the refinery sector; and
- By 2018, develop an Integrated Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.

Building Code Requirements Intended to Reduce GHG Emissions

CALIFORNIA ENERGY CODE

The California Energy Code (California Code of Regulations, Title 24, Part 6), which is incorporated into the Building Energy Efficiency Standards, was first established in 1978 in response to a legislative mandate to reduce California's energy consumption. Although these standards were not originally intended to reduce GHG emissions, increased energy efficiency results in decreased GHG emissions because energy efficient buildings require less electricity and thus less consumption of fossil fuels, which emit GHGs. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The current 2019 Building Energy Efficiency Standards, commonly referred to as the "Title 24" standards, include changes from the previous standards that were adopted, to do the following:

- Provide California with an adequate, reasonably priced, and environmentally sound supply of energy.

- Respond to Assembly Bill 32, the Global Warming Solutions Act of 2006, which mandates that California must reduce its GHG emissions to 1990 levels by 2020.
- Pursue California energy policy that energy efficiency is the resource of first choice for meeting California's energy needs.
- Act on the California Energy Commission’s Integrated Energy Policy Report, which finds that standards are the most cost effective means to achieve energy efficiency, states an expectation that the Building Energy Efficiency Standards will continue to be upgraded over time to reduce electricity and peak demand, and recognizes the role of the Building Energy Efficiency Standards in reducing energy related to meeting California's water needs and in reducing GHG emissions.
- Meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures into updates of State building codes.
- Meet Executive Order S-20-04, the Green Building Initiative, to improve the energy efficiency of non-residential buildings through aggressive standards.

The most recent Title 24 standards are the 2019 Title 24 standards. The 2019 Building Energy Efficiency Standards improve upon the 2016 Energy Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. Buildings permitted on or after January 1, 2020, must comply with the 2019 Standards. The California Energy Commission updates the standards every three years.

Single-family homes built with the 2019 standards will use about 7 percent less energy due to energy efficiency measures versus those built under the 2016 standards. Once rooftop solar electricity generation is factored in, homes built under the 2019 standards will use about 53 percent less energy than those under the 2016 standards. This will reduce greenhouse gas emissions by 700,000 metric tons over three years, equivalent to taking 115,000 fossil fuel cars off the road. Nonresidential buildings will use about 30 percent less energy due mainly to lighting upgrades.

CALIFORNIA GREEN BUILDING STANDARDS CODE

The purpose of the California Green Building Standards Code (California Code of Regulations Title 24, Part 11) is to improve public health and safety and to promote the general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices in the following categories: 1) planning and design; 2) energy efficiency; 3) water efficiency and conservation; 4) material conservation and resource efficiency; and 5) environmental quality. The California Green Building Standards, which became effective on January 1, 2011, instituted mandatory minimum environmental performance standards for all ground-up new construction of commercial, low-rise residential uses, and State-owned buildings, as well as schools and hospitals. The mandatory standards require the following:

- 20 percent mandatory reduction in indoor water use relative to baseline levels;
- 50 percent construction/demolition waste must be diverted from landfills;
- Mandatory inspections of energy systems to ensure optimal working efficiency; and

- Low-pollutant emitting exterior and interior finish materials such as paints, carpets, vinyl flooring, and particle boards.

The voluntary standards require the following:

- **Tier I:** 15 percent improvement in energy requirements, stricter water conservation requirements for specific fixtures, 65 percent reduction in construction waste, 10 percent recycled content, 20 percent permeable paving, 20 percent cement reduction, and cool/solar reflective roof.
- **Tier II:** 30 percent improvement in energy requirements, stricter water conservation requirements for specific fixtures, 75 percent reduction in construction waste, 15 percent recycled content, 30 percent permeable paving, 30 percent cement reduction, and cool/solar reflective roof.

CEQA Direction

In 2008, the Office of Planning and Research (OPR), issued Guidance regarding assessing significance of GHGs in California Environmental Quality Act (CEQA) documents; that Guidance stated that the adoption of appropriate significance thresholds was a matter of discretion for the lead agency. The OPR Guidance states:

> "[T]he global nature of climate change warrants investigation of a statewide threshold of significance for GHG emissions. To this end, OPR has asked the CARB technical staff to recommend a method for setting thresholds which will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the state. Until such time as state guidance is available on thresholds of significance for GHG emissions, we recommend the following approach to your CEQA analysis."
>
> **Determine Significance**
>
> - When assessing a project's GHG emissions, lead agencies must describe the existing environmental conditions or setting, without the project, which normally constitutes the baseline physical conditions for determining whether a project's impacts are significant.
> - As with any environmental impact, lead agencies must determine what constitutes a significant impact. 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.
> - The potential effects of a project may be individually limited but cumulatively considerable. Lead agencies should not dismiss a proposed project's direct and/or indirect climate change impacts without careful consideration, supported by substantial evidence. Documentation of available information and analysis should be provided for any project that

may significantly contribute new GHG emissions, either individually or cumulatively, directly or indirectly (e.g., transportation impacts).

- Although climate change is ultimately a cumulative impact, not every individual project that emits GHGs must necessarily be found to contribute to a significant cumulative impact on the environment. CEQA authorizes reliance on previously approved plans and mitigation programs that have adequately analyzed and mitigated GHG emissions to a less than significant level as a means to avoid or substantially reduce the cumulative impact of a project.

The OPR Guidance did not require Executive Order S-3-05 to be used as a significance threshold under CEQA. Rather, OPR recognized that, until the CARB establishes a statewide standard, selecting an appropriate threshold was within the discretion of the lead agency.

In 2010, the California Natural Resources Agency added Section 15064.4 to the CEQA Guidelines, providing new legal requirements for how agencies should address GHG-related impacts in their CEQA documents. As amended in 2019, Section 15064.4 provides as follows:

> (a) The determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in section 15064. A lead agency shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:
>
> (1) Quantify greenhouse gas emissions resulting from a project; and/or
>
> (2) Rely on a qualitative analysis or performance-based standards.
>
> (b) In determining the significance of a project's greenhouse gas emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project's emissions to the effects of climate change. A project's incremental contribution may be cumulatively considerable even if it appears relatively small compared to statewide, national or global emissions. The agency's analysis should consider a timeframe that is appropriate for the project. The agency's analysis also must reasonably reflect evolving scientific knowledge and state regulatory schemes. A lead agency should consider the following factors, among others, when determining the significance of impacts from greenhouse gas emissions on the environment:
>
> (1) The extent to which the project may increase or reduce greenhouse gas 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 greenhouse gas emissions (see, e.g., section 15183.5(b)). Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project. In determining the significance of impacts, the lead agency may consider a project's consistency with the State's long-term climate goals or strategies, provided that substantial evidence supports the agency's analysis of how those goals or strategies address the project's incremental contribution to climate change and its conclusion that the project's incremental contribution is not cumulatively considerable.
>
> (c) A lead agency may use a model or methodology to estimate greenhouse gas emissions resulting from a project. The lead agency has 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. The lead agency must support its selection of a model or methodology with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use.

Section 15126.4, subdivision (c), provides guidance on how to formulate mitigation measures addressing GHG-related impacts:

> Consistent with section 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of greenhouse gas emissions. Measures to mitigate the significant effects of greenhouse gas emissions may include, among others:
>
> (1) Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;
>
> (2) Reductions in emissions resulting from a project through implementation of project features, project design, or other measures, such as those described in Appendix F;
>
> (3) Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions;
>
> (4) Measures that sequester greenhouse gases;
>
> (5) In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of greenhouse gas emissions,

mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

California Supreme Court Decisions

THE "NEWHALL RANCH" CASE

On November 30, 2015, the California Supreme Court released its opinion on *Center for Biological Diversity v. California Department of Fish and Wildlife* (2015) 62 Cal.4th 204 (hereafter referred to as the Newhall Ranch Case).

Because of the importance of the Supreme Court as the top body within the California Judiciary, and because of the relative lack of judicial guidance regarding how GHG issues should be addressed in CEQA documents, the opinion provides very important legal guidance to agencies charged with preparing EIRs.

The case involved a challenge to an EIR prepared by the California Department of Fish and Wildlife (CDFW) for the Newhall Ranch development project in Los Angeles County, which consists of approximately 20,000 dwelling units as well as commercial and business uses, schools, golf courses, parks and other community facilities in the City of Santa Clarita.

In relation to GHG analysis, the Newhall Ranch Case illustrates the difficulty of complying with statewide GHG reduction targets at the local level using CEQA to determine whether an individual project's GHG emissions will create a significant environmental impact triggering an EIR, mitigation, and/or statement of overriding consideration. The EIR utilized compliance with AB 32's GHG reduction goals as a threshold of significance and modelled its analysis on the CARB's business-as-usual (BAU) emissions projections from the 2008 Scoping Plan. The EIR quantified the project's annual emissions at buildout and projected emissions in 2020 under a BAU scenario, in which no additional regulatory actions were taken to reduce emissions. Since the Scoping Plan determined a reduction of 29 percent from BAU was needed to meet AB 32's 2020 reduction goal, the EIR concluded that the project would have a less-than-significant impact because the project's annual GHG emissions were projected to be 31 percent below its BAU estimate.

The Supreme Court concluded that the threshold of significance used by the EIR was permissible; however, the BAU analysis lacked substantial evidence to demonstrate that the required percentage reduction from BAU is the same for an individual project as for the entire State. The court expressed skepticism that a percentage reduction goal applicable to the State as a whole would apply without change to an individual development project, regardless of its size or location. Therefore, the Supreme Court determined that the EIR's GHG analysis was not sufficient to support the conclusion that GHG impacts would be less than significant.

In addition, the Supreme Court provided the following guidance regarding potential alternative approaches to GHG impact assessment at the project level for lead agencies:

1. The lead agency determination of what level of GHG emission reduction from business-as-usual projection that a new land development at the proposed location would need to achieve to comply with statewide goals upon examination of data behind the Scoping Plan's business-as-usual emission projections. The lead agency must provide substantial evidence and account for the disconnect between the Scoping Plan, which dealt with the State as a whole, and an analysis of an individual project's land use emissions (the same issues with CEQA compliance addressed in this case);

2. The lead agency may use a project's compliance with performance based standards – such as high building energy efficiency – adopted to fulfill a statewide plan to reduce or mitigate GHG emissions to assess consistency with AB 32 to the extent that the project features comply with or exceed the regulation (See Guidelines Section 15064.4(a)(2), (b)(3); see also Guidelines Section 15064(h)(3)). A significance analysis would then need to account for the additional GHG emissions – such as transportation emissions – beyond the regulated activity. Transportation emissions are in part a function of the location, size, and density or intensity of a project, and thus can be affected by local governments' land use decision making. Additionally, the lead agency may use a programmatic effort including a general plan, long range development plan, or a separate plan to reduce GHG emissions (such as Climate Action Plan or a SB 375 metropolitan regional transportation impact Sustainable Communities Strategy) that accounts for specific geographical GHG emission reductions to streamline or tier project level CEQA analysis pursuant to Guidelines 15183.5(a)-(b) for land use and Public Resources Code Section 21155.2 and 21159.28 and Guidelines Section 15183.5(c) for transportation.

3. The lead agency may rely on existing numerical thresholds of significance for GHG emissions (such as the Bay Area Air Quality Management District's proposed threshold of significance of 1,100 MT CO_2E in annual emission for CEQA GHG emission analysis on new land use projects). The use of a numerical value provides what is "normally" considered significant but does not relieve a lead agency from independently determining the significance of the impact for the individual project (See Guidelines Section 15064.7).

THE SANDAG CASE

In *Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497 (*SANDAG)*, the Supreme Court addressed the extent to which, if any, an EIR for a Regional Transportation Plan (RTP) with a Sustainable Communities Strategy (SCS) must address the proposed project's consistency with the 2050 target set forth in Executive Order S-03-05 (i.e., 80 percent below 1990 levels). The Court held that SANDAG did not abuse its discretion by failing to treat the 2050 GHG emissions target as a threshold of significance. The Court cautioned, however, that its decision applies narrowly to the facts of the case and that the analysis in the challenged EIR should not be used as an example for other lead agencies to follow going forward. Notably, the RTP itself covered a planning period that extended all the way to 2050.

The Court acknowledged the parties' agreement that "the Executive Order lacks the force of a legal mandate binding on SANDAG[.]" (*Id*. at p. 513.) This conclusion was consistent with the Court's earlier decision in *Professional Engineers in California Government v. Schwarzenegger* (2010) 50 Cal.4th 989, 1015, which held the Governor had acted in excess of his executive authority in ordering the furloughing of State employees as a money-saving strategy. In that earlier case, which is not mentioned in the *SANDAG* decision, the Court held that the decision to furlough employees was legislative in character, and thus could only be ordered by the Legislature, and not the Governor, who, under the State constitution, may only exercise executive authority. In *SANDAG*, the Court thus impliedly recognized that Governors do not have authority to set statewide legislative policy, particularly for decades into the future. Even so, however, the Court noted, and did not question, the parties' agreement that "the Executive Order's 2050 emissions reduction target is grounded in sound science." (3 Cal.5th at p. 513.) Indeed, the Court emphasized that, although "the Executive Order 'is not an adopted GHG reduction plan' and that 'there is no legal requirement to use it as a threshold of significance,'" the 2050 goal nevertheless "expresses the pace and magnitude of reduction efforts that the scientific community believes necessary to stabilize the climate.

This scientific information has important value to policymakers and citizens in considering the emission impacts of a project like SANDAG's regional transportation plan." (*Id*. at p. 515.) Towards the end of the decision, the Court even referred to "the state's 2050 climate goals" as though the 2050 target from E.O. S-03-05 had some sort of standing under California law. (*Id*. at p. 519.) The Court seemed to reason that, because the Legislature had enacted both AB 32 and SB 32, which followed the downward GHG emissions trajectory recommended in the Executive Order, the Legislature, at some point, was also likely to adopt the 2050 target as well: "SB 32 … reaffirms California's commitment to being on the forefront of the dramatic greenhouse gas emission reductions needed to stabilize the global climate." (*Id*. at p. 519.) Finally, the Court explained that "planning agencies like SANDAG must ensure that CEQA analysis stays in step with evolving scientific knowledge and state regulatory schemes." (*Ibid*.)

In sum, the Court recognized that the Executive Order did not carry the force of law, but nevertheless considered it to be part of "state climate policy" because the Legislature, in enacting both AB 32 and SB 32, seems to be following both the IPCC recommendations for reducing GHG emissions worldwide and evolving science. Nothing in the decision, however, suggests that all projects, regardless of their buildout period, must address the 2050 target or treat it as a significance threshold.

3.3 IMPACTS AND MITIGATION MEASURES

GREENHOUSE GAS EMISSIONS THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, climate change-related impacts are considered significant if implementation of the proposed Project would do any of the following:

1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The vast majority of individual projects do not generate sufficient GHG emissions to create a project-specific impact through a direct influence to climate change; therefore, the issue of climate change typically involves an analysis of whether a project's contribution towards an impact is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15355).

For future projects, the significance of GHG emissions may be evaluated based on locally adopted quantitative thresholds, or consistency with a regional GHG reduction plan (such as a Climate Action Plan).

Prior to the Newhall Ranch decision, GHG analysis in CEQA documents often involved comparison of the project emissions to a "no action taken" (NAT) scenario. In the Newhall Ranch decision, the court found that, although comparison of a project to NAT (or "business as usual") may be appropriate in concept, the comparison of a specific local project against a statewide business as usual scenario is not an analogous comparison. Specifically, the Court stated that the business as usual approach would need to be based on a substantial evidence-supported link between data in the Scoping Plan and the project, at its proposed location, to demonstrate consistency of a project's reductions with statewide goals. It should be noted that, based on current data available, it is not possible, within the structure of the Scoping Plan sectors, to develop the evidence to reliably relate a specific land use development project's reductions to the Scoping Plan's statewide goal, as envisioned by the Court. Based on the court's finding, the NAT approach is now considered problematic and is no longer recommended. Therefore, this analysis replaces a former SJVAPCD threshold with a threshold that is consistent with the Newhall Ranch decision. This newer approach consists of evaluating the consistency of a project's GHG efficiency with California's GHG reduction targets. In light of the Newhall Ranch decision, an efficiency metric for the proposed Project buildout year (2023) was developed to assess the Project's consistency with California's adopted GHG reduction targets for 2020 under AB 32, and 2030 under SB 32, and for 2050 under Executive Order S-3-05. Because this approach gives consideration to the 2050 target, it necessarily also considers the 2020 and 2030 targets created by AB 32 and SB 32.

It was found, based on this independent calculation, that a per capita threshold of 4.02 MT CO_2e/SP/year in 2023 would be the appropriate threshold for projects in California for the Year 2023. De Novo Planning Group developed the 4.02 MT CO_2e/SP/year in 2023 threshold based on emissions for the land use-driven emission sectors in the CARB GHG Inventory. This approach to developing a GHG efficiency metric is only based on sectors that would accommodate projected growth (as indicated by population and employment growth) while allowing for consistency with the goals of AB 32. More specifically, this per service population efficiency target is based on the AB 32 GHG reduction target and GHG emissions inventory prepared for the CARB's AB 32 Scoping Plan. The land-used sector driven inventory for 1990 was divided by the population and employment projections for California in 2020. This efficiency metric allows the threshold to be applied evenly to all project types (residential, commercial/retail and mixed use) and uses an emissions inventory comprised only of sources from land-use related sectors. The efficiency approach allows lead agencies to assess whether any given project or plan would accommodate population and employment growth in a way that is consistent with the emissions limit established under AB 32.

Since this independently-generated GHG efficiency threshold for the State of California would be applicable statewide, this approach to establishing efficiency thresholds is utilized for this analysis for operational emissions.

Conclusion

Based on the discussion above, the following thresholds are applied to this analysis:

- For the evaluation of operation-related emissions, for year 2023, the independently derived per capita emissions threshold of 4.02 MT CO_2e/service population/year is used.

THRESHOLDS OF SIGNIFICANCE (ENERGY CONSERVATION)

Consistent with Appendices F and G of the CEQA Guidelines, energy-related impacts are considered significant if implementation of the proposed Project would do the following:

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation;
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency;

In order to determine whether or not the proposed Project would result in a significant impact on energy use, this EIR includes an analysis of proposed Project energy use, as provided under *Impacts and Mitigation Measures* below.

IMPACTS AND MITIGATION MEASURES

Impact 3-1: Project implementation would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases (Less than Significant)

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. Therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and virtually every individual on Earth. A project's GHG emissions are at a micro-scale relative to global emissions, but could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact. Implementation of the proposed Project would contribute to increases of GHG emissions that are associated with global climate change. Estimated GHG emissions attributable to future development would be primarily associated with increases of CO_2 and other GHG pollutants, such as methane (CH_4) and nitrous oxide (N_2O), from mobile sources and utility usage.

The proposed Project's short-term construction-related and long-term operational GHG emissions were estimated using the California Emission Estimator Model (CalEEMod)TM (v.2020.4.0). CalEEMod is a statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify GHG emissions from land use projects. The model quantifies direct GHG emissions from construction and operation (including vehicle use), as well as indirect GHG emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. Emissions are expressed in annual metric tons of CO_2 equivalent units of measure (i.e., MT CO_2e), based on the global warming potential of the individual pollutants.

SHORT-TERM CONSTRUCTION GHG EMISSIONS

Estimated maximum mitigated GHG emissions associated with construction of the proposed Project are summarized in Table 3-1. These emissions include all worker vehicle, vendor vehicle, hauler vehicle, and off-road construction vehicle GHG emissions. For the purposes of this analysis, based on input from the Project Proponents, the proposed Project is assumed to commence construction in 2022 and finish in 2023. It should be noted that this schedule is an approximation and may change over time. A regularized construction schedule was utilized for modelling purposes for the sake of simplicity.

TABLE 3-1: MAXIMUM CONSTRUCTION GHG EMISSIONS (MITIGATED AVERAGE MT CO_2E/YEAR)

YEAR	*BIO- CO_2*	*NON-BIO- CO_2*	*TOTAL CO_2*	*CH_4*	*N_2O*	*CO_2E*
2022	0	346.0	346.0	0.1	<0.1	348.9
2023	0	38.2	38.2	<0.1	<0.1	38.5

SOURCES: CALEEMOD (V.2020.4.0)

As presented in the table, short-term construction emissions of GHGs are estimated at a maximum of approximately 348.5 MT CO_2e per year.

OPERATIONAL GHG EMISSIONS

The operational GHG emissions estimate for the proposed Project includes on-site area, energy, mobile, waste, and water emissions generated by the Project during its operation. Estimated GHG emissions associated with the proposed Project are summarized in Table 3-2, below. It should be noted that CalEEMod does not account for the Governor Newsom's Zero-Emission by 2035 Executive Order (N-79-20), which requires that all new cars and passenger trucks sold in California be zero-emission vehicles by 2035. This is anticipated to substantially reduce the operational emissions associated with passenger vehicles (i.e. mobile emissions) over time, including prior the 2035 final implementation year. Therefore, the operational emissions results are likely an overestimate for mobile emissions, assuming the Executive Order is implemented. As shown in the following table, the annual mitigated GHG emissions associated with the proposed Project would be approximately 873.1 MT CO_2e.

TABLE 3-2: OPERATIONAL GHG EMISSIONS AT BUILDOUT (MITIGATED METRIC TONS/YEAR)

	BIO- CO_2	*NON-BIO- CO_2*	*TOTAL CO_2*	*CH_4*	*N_2O*	*CO_2E*
Area	0	0.8	0.8	<0.1	0	0.8
Energy	0	240.2	240.2	<0.1	<0.1	241.2
Mobile	0	570.0	570.0	<0.1	<0.1	579.8
Waste	14.4	0	14.4	0.9	0	35.7
Water	1.4	9.4	10.9	0.1	<0.1	15.6
Total	**15.8**	**820.4**	**836.2**	**1.1**	**<0.1**	**873.1**

SOURCES: CALEEMOD (V.2020.4.0)

The significance thresholds for GHG emissions should be related to compliance with AB 32 and SB 32, and Stanislaus County, as lead agency, has chosen to utilize a threshold of significance for GHG emissions as required by the Newhall Ranch decision. This threshold was independently derived by De Novo Planning Group. The rationale for using this threshold is outlined in the previous subsection, entitled "Thresholds of Significance".

According to the Traffic Study prepared for the proposed Project (Barrios Transportation Consulting, 2021), the Project would increase automobile VMT by approximately 632 net new daily trips. The proposed Project would also generate emissions from on-site energy, waste, and water emissions.

The proposed Project is estimated to generate approximately 219 residents during the Project's operational phase.[8] Dividing this number of estimated residents generated by the Project by the total annual operational GHG emissions at Project buildout yields approximately 3.99 MT CO_2e/SP/Year, which is below the 4.02 MT CO_2e/SP/year in 2023 threshold based on emissions for the land use-driven emission sectors in the CARB GHG Inventory.

CONCLUSION

GHG emissions associated the proposed Project are above the derived GHG threshold, which may affect statewide GHG reduction goals. The proposed Project would generate GHG emissions, directly and indirectly, that would not exceed the 4.02 MT CO2e/SP/year in 2023 threshold based on emissions for the land use-driven emission sectors in the CARB GHG Inventory. Therefore, the proposed Project would have a **less than significant** impact relative to greenhouse gas emissions.

Impact 3-2: Project implementation would not result in the inefficient, wasteful, or unnecessary use of energy resources (Less than Significant)

The CEQA Guidelines requires consideration of the potentially significant energy implications of a Project. CEQA requires mitigation measures to reduce "wasteful, inefficient and unnecessary" energy usage (Public Resources Code Section 21100, subdivision [b][3]). According to the CEQA Guidelines, the means to achieve the goal of conserving energy include decreasing overall energy

[8] This estimate is based on the CalEEMod model's per-dwelling unit (du) estimate for Single Family Residences of approximately 3.17 persons per Single Family Residential du, and a total Project Single Family Residences count of 69.

consumption, decreasing reliance on natural gas and oil, and increasing reliance on renewable energy sources. In particular, the proposed Project would be considered “wasteful, inefficient, and unnecessary” if it were to violate State and federal energy standards and/or result in significant adverse impacts related to Project energy requirements, energy inefficiencies, energy intensiveness of materials, cause significant impacts on local and regional energy supplies or generate requirements for additional capacity, fail to comply with existing energy standards, otherwise result in significant adverse impacts on energy resources, or conflict or create an inconsistency with applicable plan, policy, or regulation.

The amount of energy used by the proposed Project during operation would directly correlate primarily with the amount of energy used by Project buildings and outdoor lighting, and the generation of vehicle trips associated with the proposed Project. Other Project energy uses include fuel used by vehicle trips generated during Project construction and operation, fuel used by off-road construction vehicles during construction activities, and fuel used by Project maintenance activities during Project operation. The following discussion provides a detailed calculation of energy usage expected for the proposed Project, as provided by applicable modelling software (i.e. CalEEMod v2020.4.0 and the CARB’s EMFAC2021). Additional assumptions and calculations are provided within Appendix B of this EIR.

ELECTRICITY AND NATURAL GAS

Electricity and natural gas used by the proposed Project would be used primarily to generate energy for outdoor parking lot lighting. As shown in the following tables, “Energy” is one of the categories that was modeled for GHG emissions. The total unmitigated and mitigated GHG emissions generated from the “Energy” category is 241.2 CO_2e. The CalEEMod outputs shows that proposed Project electricity consumption would be approximately 549,996 kWh per year, and natural gas consumption would be approximately 165,859 kBTU per year.

ON-ROAD VEHICLES (OPERATION)

The proposed Project would generate vehicle trips during its operational phase. A description of Project operational on-road mobile energy usage is provided below.

According to the Traffic Study prepared for the proposed Project (Barrios Transportation Consulting, 2021), and as, the Project would increase automobile VMT by approximately 623 net new daily trips. In order to calculate operational on-road vehicle energy usage and emissions, De Novo Planning Group used fleet mix data from the CalEEMod (v2020.4.0) output for the proposed Project, Year 2023 gasoline and diesel MPG (miles per gallon) factors for individual vehicle classes as provided by EMFAC2021, weighted average MPG factors for gasoline and diesel were derived. Therefore, upon full buildout, the proposed Project would generate operational vehicle trips that would use a total of approximately 161 gallons of gasoline and 23 gallons of diesel per day, or 58,859 gallons of gasoline and 8,539 gallons of diesel per year.

ON-ROAD VEHICLES (CONSTRUCTION)

The proposed Project would also generate on-road vehicle trips during Project construction (from construction workers and vendors travelling to and from the Project site). Vehicle fuel consumed during these trips is estimated based the assumed construction schedule, vehicle trip lengths and number of workers per construction phase as provided by CalEEMod, and Year 2022 gasoline and diesel MPG factors provided by EMFAC2021. For the sake of simplicity, it was assumed that all construction worker light duty passenger cars and truck trips use gasoline as a fuel source, and all medium and heavy-duty vendor trucks use diesel fuel. Table 3-3, below, describes gasoline and diesel fuel consumed during each construction phase (in aggregate). As shown, the vast majority of on-road mobile vehicle fuel used during the construction of the proposed Project would occur during the building construction phase. See Appendix B of this EIR for a detailed accounting of construction on-road vehicle fuel usage estimates.

TABLE 3-3: ON-ROAD MOBILE FUEL GENERATED BY PROJECT CONSTRUCTION ACTIVITIES – BY PHASE

Construction Phase	*# of Days*	*Total Daily Worker Trips(A)*	*Total Daily Vendor Trips(A)*	*Total Hauler Worker Trips(A)*	*Total Gallons of Gasoline Fuel(B)*	*Total Gallons of Diesel Fuel(B)*
Demolition	20	15	0	47	**122**	**134**
Site Preparation	10	18	0	0	**73**	**0**
Grading	30	20	0	0	**244**	**0**
Building Construction	170	25	7	0	**1,729**	**1,235**
Paving	20	15	0	0	**122**	**0**
Architectural Coatings	20	5	0	0	**41**	**0**
Total	**N/A**	**N/A**	**N/A**	**N/A**	**2,331**	**1,369**

NOTE: (A) PROVIDED BY CALEEMOD OUTPUT. (B)SEE APPENDIX A OF THIS EIR FOR FURTHER DETAIL

SOURCE: CALEEMOD (V.2020.4.0); EMFAC2021.

OFF-ROAD VEHICLES (CONSTRUCTION)

Off-road construction vehicles would use diesel fuel during the construction phase of the proposed Project. A non-exhaustive list of off-road constructive vehicles expected to be used during the construction phase of the proposed Project includes: forklifts, generator sets, tractors, excavators, and dozers. Based on the total amount of CO_2 emissions expected to be generated by the proposed Project (as provided by the CalEEMod output), and standard conversion factors (as provided by the U.S. Energy Information Administration), the proposed Project would use a total of approximately 9,784 gallons of diesel fuel for off-road construction vehicles. Detailed calculations are provided in Appendix B of this EIR.

CONCLUSION

The proposed Project would use energy resources for the operation of Project buildings (natural gas and electricity), outdoor lighting (electricity), for on-road vehicle trips (e.g. gasoline and diesel fuel) rerouted by the proposed Project, and from off-road and on-road construction activities associated with the proposed Project (e.g. diesel fuel). Each of these activities would require the use of energy resources. The proposed Project would be responsible for conserving energy, to the extent feasible, and relies heavily on reducing per capita energy consumption to achieve this goal, including through statewide and local measures.

The proposed Project would be in compliance with all applicable federal, State, and local regulations regulating energy usage. For example, TID, the electric provider to the proposed Project, is responsible for the mix of energy resources used to provide electricity for its customers, and it is in the process of implementing the statewide RPS to increase the proportion of renewable energy (e.g. solar and wind) within its energy portfolio. TID has achieved at least a 33% mix of renewable energy resources in 2020 and is on track to achieve 60% mix of renewable energy by 2030. Other statewide measures, including those intended to improve the energy efficiency of the statewide passenger and heavy-duty truck vehicle fleet (e.g. the Pavley Bill and the Low Carbon Fuel Standard), would improve vehicle fuel economies, thereby conserving gasoline and diesel fuel. These energy savings would continue to accrue over time.

The proposed Project would comply with all existing energy standards and would not be expected to result in significant adverse impacts on energy resources. For these reasons, the proposed Project would not cause an inefficient, wasteful, or unnecessary use of energy resources nor cause a significant impact on any of the threshold as described by the *CEQA Guidelines*. This is a ***less than significant*** impact.

REFERENCES

Association of Environmental Professionals. 2018. 2018 California Environmental Quality Act (CEQA) Statute and Guidelines. January 1, 2018.

Bay Area Air Quality Management District (BAAQMD). 2017. Spare the Air: Cool the Climate. April. San Francisco, CA. Available: http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en

C. Donald Ahrens. 2006. Meteorology Today: An Introduction to Weather, Climate, & the Environment.

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures. Available: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

California Air Pollution Control Officers Association (CAPCOA). 2016. Air Toxics Hotspot Program. Available: http://www.capcoa.org/wp-content/uploads/2016/08/CAPCOA%20Prioritization%20Guidelines%20-%20August%202016%20FINAL.pdf

California Air Pollution Control Officers Association (CAPCOA). 2021. Appendix A, Calculation Details for CalEEMod. May 2021.

California Air Resources Board. 2005. Air Quality and Land Use Handbook: A Community Health Perspective. Available: https://ww3.arb.ca.gov/ch/handbook.pdf

California Air Resources Board. 2014. Background Material: Almanac of Emissions and Air Quality 2013 Edition - Chapter 4 Regional Trends and Forecasts. Page last reviewed on February 7, 2014. Available: https://ww3.arb.ca.gov/aqd/almanac/almanac13/chap413.htm

California Air Resources Board. 2021. EMFAC2021 Web Database. Available: https://arb.ca.gov/emfac/

California Air Resources Board. 2018 (November). Progress Report, California's Sustainable Communities and Climate Protection Act. Available: https://ww2.arb.ca.gov/sites/default/files/2018-11/Final2018Report_SB150_112618_02_Report.pdf. Accessed December 2, 2020.

California Air Resources Board. 2019. 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals. Available: https://ww2.arb.ca.gov/resources/documents/carb-2017-scoping-plan-identified-vmt-reductions-and-relationship-state-climate. Accessed December 3 2020.

California Air Resources Board. 2020. GHG Current California Emission Inventory Data. Available: https://ww2.arb.ca.gov/ghg-inventory-data

California Air Resources Board. 2021a. California Ambient Air Quality Standards (CAAQS). Available: http://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm

California Air Resources Board. 2021b. State and Federal Area Designations. Available: https://ww2.arb.ca.gov/our-work/programs/state-and-federal-area-designations

California Air Resources Board. 2021c. ARB Databases: Aerometric Data Analysis and Management System (ADAM). Available: http://www.arb.ca.gov/html/databases.htm.

California Air Resources Board. 2021d. What is Carbon Monoxide? Available: https://ww2.arb.ca.gov/resources/carbon-monoxide-and-health.

California Energy Commission. 2016 Building Energy Efficiency Standards. Abstract, pg. 5.

California Energy Commission. 2020. Energy Almanac. Available: http://energyalmanac.ca.gov/overview/index.html

California Environmental Protection Agency. 2010. Climate Action Team Report to Governor Schwarzenegger and the Legislature. December 2010. Available: http://www.climatechange.ca.gov/climate_action_team/reports/

Barrios Transportation Consulting. Draft Transportation Impact Assessment. Monte Vista Collection Subdivision. October 15, 2021.

Intergovernmental Panel on Climate Change (IPCC). 2013. “Climate Change 2013: The Physical Science Basis, Summary for Policymakers.” Available at: http://www.climatechange2013.org/images/report/WG1AR5_SPM_FINAL.pdf

National Aeronautics and Space Administration (NASA). Jet Propulsion Laboratory. 2015. NASA: Background Ozone is a Major Issue in U.S. West. Available: https://www.jpl.nasa.gov/news/news.php?feature=4723

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2002. Guide for Assessing and Mitigating Air Quality Impacts. Available: https://www.valleyair.org/transportation/CEQA%20Rules/GAMAQI%20Jan%202002%20Rev.pdf

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2015. Guidance for Assessing and Mitigating Air Quality Impact. Available: http://www.valleyair.org/transportation/ceqa_idx.htm

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2016. 2016 Plan for the 2008 8-Hour Ozone Standard. Available: http://valleyair.org/Air_Quality_Plans/Ozone-Plan-2016/Adopted-Plan.pdf

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2018 Plan for the 1997, 2006, and 2012 PM2.5 Standards. Available: http://valleyair.org/pmplans/documents/2018/pm-plan-adopted/2018-Plan-for-the-1997-2006-and-2012-PM2.5-Standards.pdf

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2021. Frequently Asked Questions, http://www.valleyair.org/general_info/frequently_asked_questions.htm#What%20is%20being%20done%20to%20improve%20ai r%20quality%20in%20the%20San%20Joaquin%20Valley

United States Energy Information Administration (U.S. EIA). 2020a. Analysis and Projections. Short-term Energy Outlook. Release date: September 9, 2020. Available at: https://www.eia.gov/outlooks/steo/report/global_oil.php

United States Energy Information Administration (U.S. EIA). 2020b. California State Energy Profile. Last updated January 16, 2020. Available at: https://www.eia.gov/state/print.php?sid=CA

United States Energy Information Administration (U.S. EIA). 2021. Independent Statistics and Analysis. Frequently Asked Questions. Last updated September 7, 2021. Available at: https://www.eia.gov/tools/faqs/faq.php?id=33&t=6

United States Environmental Protection Agency (USEPA). 2016. Basic Information about Carbon Monoxide (CO) Outdoor Air Pollution. Available: https://www.epa.gov/co-pollution/basic-information-about-carbon-monoxide-co-outdoor-air-pollution#Effects

United States Environmental Protection Agency (USEPA). 2017. Sulfur Dioxide Concentrations – EPA. Available: https://cfpub.epa.gov/roe/indicator_pdf.cfm?i=91

United States Environmental Protection Agency (USEPA). 2019a. Health Effects of Ozone Pollution. Available: https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution

United States Environmental Protection Agency (USEPA). 2019b. Health Effects of Ozone In the General Population. Available: https://www.epa.gov/ozone-pollution-and-your-patients-health/health-effects-ozone-general-population

United States Environmental Protection Agency (USEPA). 2019c. Health and Environmental Effects of Particulate Matter (PM). Available: https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm

United States Environmental Protection Agency (USEPA). 2019d. Basic Information About Lead Pollution. Available: https://www.epa.gov/lead-air-pollution/basic-information-about-lead-air-pollution#how

Appendices

Air Quality, GHG, and Energy

Appendix Contents

APPENDIX A

CalEEMod Output

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Monte Vista Subdivision (Denair)

Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	69.00	Dwelling Unit	18.60	124,200.00	197

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2023
Utility Company	Turlock Irrigation District				
CO2 Intensity (lb/MWhr)	607.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Per AIA Applicant information. 69 single-family dwelling units over 18.6 gross acres.

Construction Phase - Construction schedule as provided by applicant.

Off-road Equipment -

Off-road Equipment - Equipment is under 50 HP.

Off-road Equipment -

Trips and VMT -

Demolition - Demolition of five buildings (approximately 4500 sf, 1600 sf, 1250 sf, 900 sf, and 2,100 sf, respectively). Total of approx. 10,350 sf.

Grading -

Vehicle Trips - Trip rate: 632 total net new project trips (as provided by the Traffic Study); with 69 dwelling units, this is equivalent to 9.15942 trips/size/day.

Woodstoves - Per District Rule 4901.

Mobile Land Use Mitigation - Improve Walkability Design: 7 intersections/square mile; Improve destination accessibility: 2.82 miles to job center; Improve ped network (project site); Provide traffic calming measures (25%/25%).

Mobile Commute Mitigation - Implement School Bus Program (100% family using).

Area Mitigation - No hearths; 3% electric landscape equipment.

Energy Mitigation - Assume 3 kw of solar per residences (pre California requirements): =207 kwh generated on=site renewable.

Fleet Mix - Air District Fleet Mix.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	300.00	170.00
tblFleetMix	HHD	0.02	0.02
tblFleetMix	LDA	0.52	0.53
tblFleetMix	LDT1	0.05	0.20
tblFleetMix	LDT2	0.17	0.17
tblFleetMix	LHD1	0.03	1.3000e-003
tblFleetMix	LHD2	8.1480e-003	9.0000e-004
tblFleetMix	MCY	0.03	2.5000e-003
tblFleetMix	MDV	0.16	0.05
tblFleetMix	MH	4.0720e-003	1.8000e-003
tblFleetMix	MHD	0.01	8.6000e-003
tblFleetMix	OBUS	8.6000e-004	0.00
tblFleetMix	SBUS	1.4010e-003	7.0000e-004
tblFleetMix	UBUS	3.0500e-004	4.4000e-003
tblLandUse	LotAcreage	22.40	18.60
tblVehicleTrips	ST_TR	9.54	9.16
tblVehicleTrips	SU_TR	8.55	9.16
tblVehicleTrips	WD_TR	9.44	9.16

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.2426	2.2870	2.1227	3.9600e-003	0.2657	0.1098	0.3755	0.1126	0.1025	0.2151	0.0000	346.0270	346.0270	0.0862	2.4200e-003	348.9050
2023	1.1878	0.1965	0.2626	4.4000e-004	2.9500e-003	9.6800e-003	0.0126	7.9000e-004	9.0500e-003	9.8400e-003	0.0000	38.2391	38.2391	9.7400e-003	1.8000e-004	38.5350
Maximum	**1.1878**	**2.2870**	**2.1227**	**3.9600e-003**	**0.2657**	**0.1098**	**0.3755**	**0.1126**	**0.1025**	**0.2151**	**0.0000**	**346.0270**	**346.0270**	**0.0862**	**2.4200e-003**	**348.9050**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.2426	2.2870	2.1227	3.9600e-003	0.2657	0.1098	0.3755	0.1126	0.1025	0.2151	0.0000	346.0266	346.0266	0.0862	2.4200e-003	348.9047
2023	1.1878	0.1965	0.2626	4.4000e-004	2.9500e-003	9.6800e-003	0.0126	7.9000e-004	9.0500e-003	9.8400e-003	0.0000	38.2390	38.2390	9.7400e-003	1.8000e-004	38.5349
Maximum	**1.1878**	**2.2870**	**2.1227**	**3.9600e-003**	**0.2657**	**0.1098**	**0.3755**	**0.1126**	**0.1025**	**0.2151**	**0.0000**	**346.0266**	**346.0266**	**0.0862**	**2.4200e-003**	**348.9047**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**2-1-2022**	**4-30-2022**	0.7592	0.7592
2	**5-1-2022**	**7-31-2022**	0.7901	0.7901
3	**8-1-2022**	**10-31-2022**	0.5872	0.5872
4	**11-1-2022**	**1-31-2023**	0.5442	0.5442
5	**2-1-2023**	**4-30-2023**	1.2335	1.2335
		Highest	1.2335	1.2335

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.9992	0.0879	3.9659	0.0114		0.5665	0.5665		0.5665	0.5665	75.1947	30.7282	105.9228	0.3529	5.5000e-004	114.9086
Energy	8.9400e-003	0.0764	0.0325	4.9000e-004		6.1800e-003	6.1800e-003		6.1800e-003	6.1800e-003	0.0000	240.2411	240.2411	9.9300e-003	2.6200e-003	241.2704
Mobile	0.2199	0.3990	2.6054	6.7400e-003	0.6903	5.3600e-003	0.6957	0.1841	4.9900e-003	0.1891	0.0000	629.4475	629.4475	0.0454	0.0317	640.0397
Waste						0.0000	0.0000		0.0000	0.0000	14.3961	0.0000	14.3961	0.8508	0.0000	35.6658
Water						0.0000	0.0000		0.0000	0.0000	1.4263	9.4441	10.8703	0.1470	3.5200e-003	15.5947
Total	**1.2280**	**0.5633**	**6.6038**	**0.0187**	**0.6903**	**0.5780**	**1.2684**	**0.1841**	**0.5777**	**0.7618**	**91.0170**	**909.8608**	**1,000.8778**	**1.4061**	**0.0384**	**1,047.4792**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6169	5.8700e-003	0.5088	3.0000e-005		2.8100e-003	2.8100e-003		2.8100e-003	2.8100e-003	0.0000	0.8294	0.8294	7.9000e-004	0.0000	0.8492
Energy	8.9400e-003	0.0764	0.0325	4.9000e-004		6.1800e-003	6.1800e-003		6.1800e-003	6.1800e-003	0.0000	240.1840	240.1840	9.9300e-003	2.6200e-003	241.2131
Mobile	0.2155	0.3707	2.4134	6.1000e-003	0.6230	4.8900e-003	0.6279	0.1662	4.5500e-003	0.1707	0.0000	569.9541	569.9541	0.0424	0.0293	579.7579
Waste						0.0000	0.0000		0.0000	0.0000	14.3961	0.0000	14.3961	0.8508	0.0000	35.6658
Water						0.0000	0.0000		0.0000	0.0000	1.4263	9.4441	10.8703	0.1470	3.5200e-003	15.5947
Total	**0.8413**	**0.4530**	**2.9547**	**6.6200e-003**	**0.6230**	**0.0139**	**0.6369**	**0.1662**	**0.0135**	**0.1797**	**15.8224**	**820.4115**	**836.2339**	**1.0509**	**0.0355**	**873.0807**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**31.49**	**19.58**	**55.26**	**64.50**	**9.75**	**97.60**	**49.79**	**9.75**	**97.66**	**76.41**	**82.62**	**9.83**	**16.45**	**25.26**	**7.65**	**16.65**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	3/1/2022	3/28/2022	5	20	
2	Site Preparation	Site Preparation	3/29/2022	4/11/2022	5	10	
3	Grading	Grading	4/12/2022	5/23/2022	5	30	

4	Building Construction	Building Construction	5/24/2022	1/16/2023	5	170	
5	Paving	Paving	1/17/2023	2/13/2023	5	20	
6	Architectural Coating	Architectural Coating	2/14/2023	3/13/2023	5	20	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 90

Acres of Paving: 0

Residential Indoor: 251,505; Residential Outdoor: 83,835; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36

Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	47.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	25.00	7.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.0900e-003	0.0000	5.0900e-003	7.7000e-004	0.0000	7.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0264	0.2572	0.2059	3.9000e-004		0.0124	0.0124		0.0116	0.0116	0.0000	33.9902	33.9902	9.5500e-003	0.0000	34.2289
Total	**0.0264**	**0.2572**	**0.2059**	**3.9000e-004**	**5.0900e-003**	**0.0124**	**0.0175**	**7.7000e-004**	**0.0116**	**0.0123**	**0.0000**	**33.9902**	**33.9902**	**9.5500e-003**	**0.0000**	**34.2289**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.0000e-005	3.6000e-003	6.8000e-004	1.0000e-005	4.0000e-004	4.0000e-005	4.4000e-004	1.1000e-004	3.0000e-005	1.4000e-004	0.0000	1.3864	1.3864	1.0000e-005	2.2000e-004	1.4515
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-004	3.7000e-004	4.3100e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9970	0.9970	4.0000e-005	3.0000e-005	1.0072
Total	**6.3000e-004**	**3.9700e-003**	**4.9900e-003**	**2.0000e-005**	**1.6000e-003**	**5.0000e-005**	**1.6500e-003**	**4.3000e-004**	**4.0000e-005**	**4.7000e-004**	**0.0000**	**2.3833**	**2.3833**	**5.0000e-005**	**2.5000e-004**	**2.4587**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.0900e-003	0.0000	5.0900e-003	7.7000e-004	0.0000	7.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0264	0.2572	0.2059	3.9000e-004		0.0124	0.0124		0.0116	0.0116	0.0000	33.9902	33.9902	9.5500e-003	0.0000	34.2289
Total	**0.0264**	**0.2572**	**0.2059**	**3.9000e-004**	**5.0900e-003**	**0.0124**	**0.0175**	**7.7000e-004**	**0.0116**	**0.0123**	**0.0000**	**33.9902**	**33.9902**	**9.5500e-003**	**0.0000**	**34.2289**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.0000e-005	3.6000e-003	6.8000e-004	1.0000e-005	4.0000e-004	4.0000e-005	4.4000e-004	1.1000e-004	3.0000e-005	1.4000e-004	0.0000	1.3864	1.3864	1.0000e-005	2.2000e-004	1.4515
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-004	3.7000e-004	4.3100e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9970	0.9970	4.0000e-005	3.0000e-005	1.0072
Total	**6.3000e-004**	**3.9700e-003**	**4.9900e-003**	**2.0000e-005**	**1.6000e-003**	**5.0000e-005**	**1.6500e-003**	**4.3000e-004**	**4.0000e-005**	**4.7000e-004**	**0.0000**	**2.3833**	**2.3833**	**5.0000e-005**	**2.5000e-004**	**2.4587**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0159	0.1654	0.0985	1.9000e-004		8.0600e-003	8.0600e-003		7.4200e-003	7.4200e-003	0.0000	16.7197	16.7197	5.4100e-003	0.0000	16.8549
Total	**0.0159**	**0.1654**	**0.0985**	**1.9000e-004**	**0.0983**	**8.0600e-003**	**0.1064**	**0.0505**	**7.4200e-003**	**0.0579**	**0.0000**	**16.7197**	**16.7197**	**5.4100e-003**	**0.0000**	**16.8549**

3.3 Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2000e-004	2.2000e-004	2.5900e-003	1.0000e-005	7.2000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.5982	0.5982	2.0000e-005	2.0000e-005	0.6043
Total	**3.2000e-004**	**2.2000e-004**	**2.5900e-003**	**1.0000e-005**	**7.2000e-004**	**0.0000**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.5982**	**0.5982**	**2.0000e-005**	**2.0000e-005**	**0.6043**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0159	0.1654	0.0985	1.9000e-004		8.0600e-003	8.0600e-003		7.4200e-003	7.4200e-003	0.0000	16.7197	16.7197	5.4100e-003	0.0000	16.8549
Total	**0.0159**	**0.1654**	**0.0985**	**1.9000e-004**	**0.0983**	**8.0600e-003**	**0.1064**	**0.0505**	**7.4200e-003**	**0.0579**	**0.0000**	**16.7197**	**16.7197**	**5.4100e-003**	**0.0000**	**16.8549**

3.3 Site Preparation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2000e-004	2.2000e-004	2.5900e-003	1.0000e-005	7.2000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.5982	0.5982	2.0000e-005	2.0000e-005	0.6043
Total	**3.2000e-004**	**2.2000e-004**	**2.5900e-003**	**1.0000e-005**	**7.2000e-004**	**0.0000**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.5982**	**0.5982**	**2.0000e-005**	**2.0000e-005**	**0.6043**

3.4 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1381	0.0000	0.1381	0.0548	0.0000	0.0548	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0544	0.5827	0.4356	9.3000e-004		0.0245	0.0245		0.0226	0.0226	0.0000	81.8019	81.8019	0.0265	0.0000	82.4633
Total	**0.0544**	**0.5827**	**0.4356**	**9.3000e-004**	**0.1381**	**0.0245**	**0.1626**	**0.0548**	**0.0226**	**0.0774**	**0.0000**	**81.8019**	**81.8019**	**0.0265**	**0.0000**	**82.4633**

3.4 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	7.3000e-004	8.6300e-003	2.0000e-005	2.4000e-003	1.0000e-005	2.4100e-003	6.4000e-004	1.0000e-005	6.5000e-004	0.0000	1.9940	1.9940	7.0000e-005	6.0000e-005	2.0144
Total	**1.0700e-003**	**7.3000e-004**	**8.6300e-003**	**2.0000e-005**	**2.4000e-003**	**1.0000e-005**	**2.4100e-003**	**6.4000e-004**	**1.0000e-005**	**6.5000e-004**	**0.0000**	**1.9940**	**1.9940**	**7.0000e-005**	**6.0000e-005**	**2.0144**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1381	0.0000	0.1381	0.0548	0.0000	0.0548	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0544	0.5827	0.4356	9.3000e-004		0.0245	0.0245		0.0226	0.0226	0.0000	81.8018	81.8018	0.0265	0.0000	82.4632
Total	**0.0544**	**0.5827**	**0.4356**	**9.3000e-004**	**0.1381**	**0.0245**	**0.1626**	**0.0548**	**0.0226**	**0.0774**	**0.0000**	**81.8018**	**81.8018**	**0.0265**	**0.0000**	**82.4632**

3.4 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	7.3000e-004	8.6300e-003	2.0000e-005	2.4000e-003	1.0000e-005	2.4100e-003	6.4000e-004	1.0000e-005	6.5000e-004	0.0000	1.9940	1.9940	7.0000e-005	6.0000e-005	2.0144
Total	**1.0700e-003**	**7.3000e-004**	**8.6300e-003**	**2.0000e-005**	**2.4000e-003**	**1.0000e-005**	**2.4100e-003**	**6.4000e-004**	**1.0000e-005**	**6.5000e-004**	**0.0000**	**1.9940**	**1.9940**	**7.0000e-005**	**6.0000e-005**	**2.0144**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1357	1.2414	1.3009	2.1400e-003		0.0643	0.0643		0.0605	0.0605	0.0000	184.2216	184.2216	0.0441	0.0000	185.3249
Total	**0.1357**	**1.2414**	**1.3009**	**2.1400e-003**		**0.0643**	**0.0643**		**0.0605**	**0.0605**	**0.0000**	**184.2216**	**184.2216**	**0.0441**	**0.0000**	**185.3249**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1700e-003	0.0306	8.3700e-003	1.2000e-004	3.6900e-003	3.3000e-004	4.0200e-003	1.0600e-003	3.2000e-004	1.3800e-003	0.0000	11.1082	11.1082	7.0000e-005	1.6800e-003	11.6106
Worker	7.1200e-003	4.8600e-003	0.0572	1.4000e-004	0.0159	1.0000e-004	0.0160	4.2200e-003	9.0000e-005	4.3100e-003	0.0000	13.2099	13.2099	4.7000e-004	4.1000e-004	13.3451
Total	**8.2900e-003**	**0.0354**	**0.0655**	**2.6000e-004**	**0.0196**	**4.3000e-004**	**0.0200**	**5.2800e-003**	**4.1000e-004**	**5.6900e-003**	**0.0000**	**24.3181**	**24.3181**	**5.4000e-004**	**2.0900e-003**	**24.9557**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1357	1.2414	1.3009	2.1400e-003		0.0643	0.0643		0.0605	0.0605	0.0000	184.2214	184.2214	0.0441	0.0000	185.3247
Total	**0.1357**	**1.2414**	**1.3009**	**2.1400e-003**		**0.0643**	**0.0643**		**0.0605**	**0.0605**	**0.0000**	**184.2214**	**184.2214**	**0.0441**	**0.0000**	**185.3247**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1700e-003	0.0306	8.3700e-003	1.2000e-004	3.6900e-003	3.3000e-004	4.0200e-003	1.0600e-003	3.2000e-004	1.3800e-003	0.0000	11.1082	11.1082	7.0000e-005	1.6800e-003	11.6106
Worker	7.1200e-003	4.8600e-003	0.0572	1.4000e-004	0.0159	1.0000e-004	0.0160	4.2200e-003	9.0000e-005	4.3100e-003	0.0000	13.2099	13.2099	4.7000e-004	4.1000e-004	13.3451
Total	**8.2900e-003**	**0.0354**	**0.0655**	**2.6000e-004**	**0.0196**	**4.3000e-004**	**0.0200**	**5.2800e-003**	**4.1000e-004**	**5.6900e-003**	**0.0000**	**24.3181**	**24.3181**	**5.4000e-004**	**2.0900e-003**	**24.9557**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.6500e-003	0.0791	0.0893	1.5000e-004		3.8500e-003	3.8500e-003		3.6200e-003	3.6200e-003	0.0000	12.7493	12.7493	3.0300e-003	0.0000	12.8251
Total	**8.6500e-003**	**0.0791**	**0.0893**	**1.5000e-004**		**3.8500e-003**	**3.8500e-003**		**3.6200e-003**	**3.6200e-003**	**0.0000**	**12.7493**	**12.7493**	**3.0300e-003**	**0.0000**	**12.8251**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	1.7000e-003	4.9000e-004	1.0000e-005	2.5000e-004	1.0000e-005	2.7000e-004	7.0000e-005	1.0000e-005	8.0000e-005	0.0000	0.7390	0.7390	0.0000	1.1000e-004	0.7724
Worker	4.5000e-004	2.9000e-004	3.6000e-003	1.0000e-005	1.1000e-003	1.0000e-005	1.1000e-003	2.9000e-004	1.0000e-005	3.0000e-004	0.0000	0.8843	0.8843	3.0000e-005	3.0000e-005	0.8929
Total	**4.9000e-004**	**1.9900e-003**	**4.0900e-003**	**2.0000e-005**	**1.3500e-003**	**2.0000e-005**	**1.3700e-003**	**3.6000e-004**	**2.0000e-005**	**3.8000e-004**	**0.0000**	**1.6234**	**1.6234**	**3.0000e-005**	**1.4000e-004**	**1.6652**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.6500e-003	0.0791	0.0893	1.5000e-004		3.8500e-003	3.8500e-003		3.6200e-003	3.6200e-003	0.0000	12.7493	12.7493	3.0300e-003	0.0000	12.8251
Total	**8.6500e-003**	**0.0791**	**0.0893**	**1.5000e-004**		**3.8500e-003**	**3.8500e-003**		**3.6200e-003**	**3.6200e-003**	**0.0000**	**12.7493**	**12.7493**	**3.0300e-003**	**0.0000**	**12.8251**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	1.7000e-003	4.9000e-004	1.0000e-005	2.5000e-004	1.0000e-005	2.7000e-004	7.0000e-005	1.0000e-005	8.0000e-005	0.0000	0.7390	0.7390	0.0000	1.1000e-004	0.7724
Worker	4.5000e-004	2.9000e-004	3.6000e-003	1.0000e-005	1.1000e-003	1.0000e-005	1.1000e-003	2.9000e-004	1.0000e-005	3.0000e-004	0.0000	0.8843	0.8843	3.0000e-005	3.0000e-005	0.8929
Total	**4.9000e-004**	**1.9900e-003**	**4.0900e-003**	**2.0000e-005**	**1.3500e-003**	**2.0000e-005**	**1.3700e-003**	**3.6000e-004**	**2.0000e-005**	**3.8000e-004**	**0.0000**	**1.6234**	**1.6234**	**3.0000e-005**	**1.4000e-004**	**1.6652**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0103	0.1019	0.1458	2.3000e-004		5.1000e-003	5.1000e-003		4.6900e-003	4.6900e-003	0.0000	20.0269	20.0269	6.4800e-003	0.0000	20.1888
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0103**	**0.1019**	**0.1458**	**2.3000e-004**		**5.1000e-003**	**5.1000e-003**		**4.6900e-003**	**4.6900e-003**	**0.0000**	**20.0269**	**20.0269**	**6.4800e-003**	**0.0000**	**20.1888**

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.9000e-004	3.2000e-004	3.9300e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	0.9647	0.9647	3.0000e-005	3.0000e-005	0.9741
Total	**4.9000e-004**	**3.2000e-004**	**3.9300e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9647**	**0.9647**	**3.0000e-005**	**3.0000e-005**	**0.9741**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0103	0.1019	0.1458	2.3000e-004		5.1000e-003	5.1000e-003		4.6900e-003	4.6900e-003	0.0000	20.0268	20.0268	6.4800e-003	0.0000	20.1888
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0103**	**0.1019**	**0.1458**	**2.3000e-004**		**5.1000e-003**	**5.1000e-003**		**4.6900e-003**	**4.6900e-003**	**0.0000**	**20.0268**	**20.0268**	**6.4800e-003**	**0.0000**	**20.1888**

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.9000e-004	3.2000e-004	3.9300e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	0.9647	0.9647	3.0000e-005	3.0000e-005	0.9741
Total	**4.9000e-004**	**3.2000e-004**	**3.9300e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9647**	**0.9647**	**3.0000e-005**	**3.0000e-005**	**0.9741**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1657					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9200e-003	0.0130	0.0181	3.0000e-005		7.1000e-004	7.1000e-004		7.1000e-004	7.1000e-004	0.0000	2.5533	2.5533	1.5000e-004	0.0000	2.5571
Total	**1.1677**	**0.0130**	**0.0181**	**3.0000e-005**		**7.1000e-004**	**7.1000e-004**		**7.1000e-004**	**7.1000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.5000e-004**	**0.0000**	**2.5571**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6000e-004	1.1000e-004	1.3100e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3216	0.3216	1.0000e-005	1.0000e-005	0.3247
Total	**1.6000e-004**	**1.1000e-004**	**1.3100e-003**	**0.0000**	**4.0000e-004**	**0.0000**	**4.0000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3216**	**0.3216**	**1.0000e-005**	**1.0000e-005**	**0.3247**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1657					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9200e-003	0.0130	0.0181	3.0000e-005		7.1000e-004	7.1000e-004		7.1000e-004	7.1000e-004	0.0000	2.5533	2.5533	1.5000e-004	0.0000	2.5571
Total	**1.1677**	**0.0130**	**0.0181**	**3.0000e-005**		**7.1000e-004**	**7.1000e-004**		**7.1000e-004**	**7.1000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.5000e-004**	**0.0000**	**2.5571**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6000e-004	1.1000e-004	1.3100e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3216	0.3216	1.0000e-005	1.0000e-005	0.3247
Total	**1.6000e-004**	**1.1000e-004**	**1.3100e-003**	**0.0000**	**4.0000e-004**	**0.0000**	**4.0000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3216**	**0.3216**	**1.0000e-005**	**1.0000e-005**	**0.3247**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Walkability Design

Improve Destination Accessibility

Improve Pedestrian Network

Provide Traffic Calming Measures

Implement School Bus Program

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2155	0.3707	2.4134	6.1000e-003	0.6230	4.8900e-003	0.6279	0.1662	4.5500e-003	0.1707	0.0000	569.9541	569.9541	0.0424	0.0293	579.7579
Unmitigated	0.2199	0.3990	2.6054	6.7400e-003	0.6903	5.3600e-003	0.6957	0.1841	4.9900e-003	0.1891	0.0000	629.4475	629.4475	0.0454	0.0317	640.0397

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	632.00	632.00	632.00	1,852,368	1,671,762
Total	632.00	632.00	632.00	1,852,368	1,671,762

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	7.30	7.50	48.40	13.90	37.70	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.534300	0.203000	0.167300	0.054500	0.001300	0.000900	0.008600	0.020700	0.000000	0.004400	0.002500	0.000700	0.001800

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Kilowatt Hours of Renewable Electricity Generated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	151.6753	151.6753	8.2300e-003	1.0000e-003	152.1785
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	151.7324	151.7324	8.2400e-003	1.0000e-003	152.2357
NaturalGas Mitigated	8.9400e-003	0.0764	0.0325	4.9000e-004		6.1800e-003	6.1800e-003		6.1800e-003	6.1800e-003	0.0000	88.5087	88.5087	1.7000e-003	1.6200e-003	89.0347
NaturalGas Unmitigated	8.9400e-003	0.0764	0.0325	4.9000e-004		6.1800e-003	6.1800e-003		6.1800e-003	6.1800e-003	0.0000	88.5087	88.5087	1.7000e-003	1.6200e-003	89.0347

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	1.65859e+006	8.9400e-003	0.0764	0.0325	4.9000e-004		6.1800e-003	6.1800e-003		6.1800e-003	6.1800e-003	0.0000	88.5087	88.5087	1.7000e-003	1.6200e-003	89.0347
Total		**8.9400e-003**	**0.0764**	**0.0325**	**4.9000e-004**		**6.1800e-003**	**6.1800e-003**		**6.1800e-003**	**6.1800e-003**	**0.0000**	**88.5087**	**88.5087**	**1.7000e-003**	**1.6200e-003**	**89.0347**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	1.65859e +006	8.9400e-003	0.0764	0.0325	4.9000e-004		6.1800e-003	6.1800e-003		6.1800e-003	6.1800e-003	0.0000	88.5087	88.5087	1.7000e-003	1.6200e-003	89.0347
Total		**8.9400e-003**	**0.0764**	**0.0325**	**4.9000e-004**		**6.1800e-003**	**6.1800e-003**		**6.1800e-003**	**6.1800e-003**	**0.0000**	**88.5087**	**88.5087**	**1.7000e-003**	**1.6200e-003**	**89.0347**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	550203	151.7324	8.2400e-003	1.0000e-003	152.2357
Total		**151.7324**	**8.2400e-003**	**1.0000e-003**	**152.2357**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	549996	151.6753	8.2300e-003	1.0000e-003	152.1785
Total		**151.6753**	**8.2300e-003**	**1.0000e-003**	**152.1785**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6169	5.8700e-003	0.5088	3.0000e-005		2.8100e-003	2.8100e-003		2.8100e-003	2.8100e-003	0.0000	0.8294	0.8294	7.9000e-004	0.0000	0.8492
Unmitigated	0.9992	0.0879	3.9659	0.0114		0.5665	0.5665		0.5665	0.5665	75.1947	30.7282	105.9228	0.3529	5.5000e-004	114.9086

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1166					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.4851					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.3821	0.0820	3.4534	0.0114		0.5637	0.5637		0.5637	0.5637	75.1947	29.8913	105.0860	0.3521	5.5000e-004	114.0516
Landscaping	0.0154	5.9100e-003	0.5125	3.0000e-005		2.8400e-003	2.8400e-003		2.8400e-003	2.8400e-003	0.0000	0.8369	0.8369	8.0000e-004	0.0000	0.8570
Total	**0.9992**	**0.0879**	**3.9659**	**0.0114**		**0.5665**	**0.5665**		**0.5665**	**0.5665**	**75.1947**	**30.7282**	**105.9229**	**0.3529**	**5.5000e-004**	**114.9086**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1166					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.4851					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0152	5.8700e-003	0.5088	3.0000e-005		2.8100e-003	2.8100e-003		2.8100e-003	2.8100e-003	0.0000	0.8294	0.8294	7.9000e-004	0.0000	0.8492
Total	**0.6169**	**5.8700e-003**	**0.5088**	**3.0000e-005**		**2.8100e-003**	**2.8100e-003**		**2.8100e-003**	**2.8100e-003**	**0.0000**	**0.8294**	**0.8294**	**7.9000e-004**	**0.0000**	**0.8492**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	10.8703	0.1470	3.5200e-003	15.5947
Unmitigated	10.8703	0.1470	3.5200e-003	15.5947

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	4.49563 / 2.8342	10.8703	0.1470	3.5200e-003	15.5947
Total		**10.8703**	**0.1470**	**3.5200e-003**	**15.5947**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	4.49563 / 2.8342	10.8703	0.1470	3.5200e-003	15.5947
Total		**10.8703**	**0.1470**	**3.5200e-003**	**15.5947**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	14.3961	0.8508	0.0000	35.6658
Unmitigated	14.3961	0.8508	0.0000	35.6658

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	70.92	14.3961	0.8508	0.0000	35.6658
Total		**14.3961**	**0.8508**	**0.0000**	**35.6658**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	70.92	14.3961	0.8508	0.0000	35.6658
Total		**14.3961**	**0.8508**	**0.0000**	**35.6658**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B

Energy Calculations

Source: EMFAC2021 (v1.0.1) Emissions Inventory
Region Type: County
Region: Stanislaus
Calendar Year: 2022
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	Trips	Fuel Consumption	**MPG**	
Stanislaus	2022	All Other Buses	Aggregate	Aggregate	Diesel	109.4388114	5900.3208	974.0054219	0.682301153	**8.647678**	
Stanislaus	2022	LDA	Aggregate	Aggregate	Gasoline	185795.1124	7166893.5	856792.1618	244.3908493	**29.32554**	
Stanislaus	2022	LDA	Aggregate	Aggregate	Diesel	557.2731511	17491.773	2383.092557	0.388380078	**45.03777**	
Stanislaus	2022	LDT1	Aggregate	Aggregate	Gasoline	19345.26372	594610.48	82792.66091	24.50489632	**24.26497**	
Stanislaus	2022	LDT1	Aggregate	Aggregate	Diesel	14.39674689	165.85336	42.79816683	0.00635229	**26.10922**	
Stanislaus	2022	LDT2	Aggregate	Aggregate	Gasoline	77568.14787	2886979.7	357449.2438	124.1649245	**23.25117**	
Stanislaus	2022	LDT2	Aggregate	Aggregate	Diesel	204.2114164	8418.1459	970.6124513	0.25146013	**33.47706**	
Stanislaus	2022	LHD1	Aggregate	Aggregate	Gasoline	9492.143093	332501.29	141418.7888	36.61819917	**9.08022**	
Stanislaus	2022	LHD1	Aggregate	Aggregate	Diesel	9683.604913	344078.12	121807.5678	21.7978486	**15.78496**	
Stanislaus	2022	LHD2	Aggregate	Aggregate	Gasoline	1611.102131	60974.344	24003.0212	7.21258533	**8.453882**	
Stanislaus	2022	LHD2	Aggregate	Aggregate	Diesel	3296.355603	124367.62	41464.00667	9.628697438	**12.91635**	
Stanislaus	2022	MCY	Aggregate	Aggregate	Gasoline	10681.40648	57567.21	21362.81297	1.387377251	**41.49355**	
Stanislaus	2022	MDV	Aggregate	Aggregate	Gasoline	82643.45533	2801827.3	372440.6321	147.465076	**18.99994**	
Stanislaus	2022	MDV	Aggregate	Aggregate	Diesel	1220.570055	47397.161	5721.647849	1.893987318	**25.02507**	
Stanislaus	2022	MH	Aggregate	Aggregate	Gasoline	1436.726738	12189.647	143.7301429	2.766034919	**4.406903**	
Stanislaus	2022	MH	Aggregate	Aggregate	Diesel	571.8906356	5038.4713	57.18906356	0.535143048	**9.415186**	
Stanislaus	2022	Motor Coach	Aggregate	Aggregate	Diesel	23.971361	3428.5165	550.8618758	0.624608897	**5.489061**	
Stanislaus	2022	OBUS	Aggregate	Aggregate	Gasoline	154.0481269	6659.7603	3082.194923	1.42627994	**4.669322**	
Stanislaus	2022	PTO	Aggregate	Aggregate	Diesel	0	10559.509	0	2.235529256	**4.723494**	
Stanislaus	2022	SBUS	Aggregate	Aggregate	Gasoline	201.4635282	9994.5685	805.8541129	1.030409587	**9.699607**	
Stanislaus	2022	SBUS	Aggregate	Aggregate	Diesel	483.8465311	11257.468	7006.09777	1.390297878	**8.097163**	
Stanislaus	2022	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	7.479659163	495.7477	171.8825676	0.056231076	**8.816258**	
Stanislaus	2022	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	10.07263414	680.0767	231.4691325	0.076926676	**8.840583**	
Stanislaus	2022	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	30.36628123	1777.0599	697.8171427	0.19909586	**8.92565**	
Stanislaus	2022	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	53.8947146	11146.618	1238.500541	1.168775076	**9.537008**	**MHD**
Stanislaus	2022	T6 Instate Delivery Cla	Aggregate	Aggregate	Diesel	128.3481905	4312.4011	1831.528678	0.535120002	**8.058755**	**8.541745**
Stanislaus	2022	T6 Instate Delivery Cla	Aggregate	Aggregate	Diesel	134.519305	4620.844	1919.590482	0.571805315	**8.081149**	
Stanislaus	2022	T6 Instate Delivery Cla	Aggregate	Aggregate	Diesel	412.547751	14319.731	5887.056407	1.766810409	**8.104849**	
Stanislaus	2022	T6 Instate Delivery Cla	Aggregate	Aggregate	Diesel	143.5926387	7852.1364	2049.066955	0.943160548	**8.325344**	
Stanislaus	2022	T6 Instate Other Class	Aggregate	Aggregate	Diesel	504.2403775	20377.578	5829.018764	2.416213728	**8.433682**	
Stanislaus	2022	T6 Instate Other Class	Aggregate	Aggregate	Diesel	977.3027274	43567.729	11297.61953	5.152377146	**8.45585**	
Stanislaus	2022	T6 Instate Other Class	Aggregate	Aggregate	Diesel	650.6293082	27572.519	7521.274803	3.242205714	**8.504247**	
Stanislaus	2022	T6 Instate Other Class	Aggregate	Aggregate	Diesel	476.0241252	21519.333	5502.838887	2.468511915	**8.717533**	
Stanislaus	2022	T6 Instate Tractor Clas	Aggregate	Aggregate	Diesel	13.10707827	684.17168	151.5178248	0.07513097	**9.106387**	
Stanislaus	2022	T6 Instate Tractor Clas	Aggregate	Aggregate	Diesel	530.7116279	32991.228	6135.026419	3.644661719	**9.051932**	
Stanislaus	2022	T6 OOS Class 4	Aggregate	Aggregate	Diesel	4.306978734	283.10669	98.97437131	0.032099273	**8.819723**	
Stanislaus	2022	T6 OOS Class 5	Aggregate	Aggregate	Diesel	5.777146841	388.37147	132.7588344	0.043926033	**8.841488**	**HHD**
Stanislaus	2022	T6 OOS Class 6	Aggregate	Aggregate	Diesel	17.45565351	1014.8258	401.1309177	0.113688377	**8.926381**	**7.03159**
Stanislaus	2022	T6 OOS Class 7	Aggregate	Aggregate	Diesel	29.55370994	7379.0453	679.1442544	0.772458175	**9.552679**	
Stanislaus	2022	T6 Public Class 4	Aggregate	Aggregate	Diesel	42.71114877	1362.5988	219.1081932	0.183653609	**7.419396**	
Stanislaus	2022	T6 Public Class 5	Aggregate	Aggregate	Diesel	111.3307862	4006.3501	571.1269333	0.5277113	**7.591935**	
Stanislaus	2022	T6 Public Class 6	Aggregate	Aggregate	Diesel	107.3905519	3614.4527	550.9135312	0.485527884	**7.444377**	
Stanislaus	2022	T6 Public Class 7	Aggregate	Aggregate	Diesel	165.846289	7043.5414	850.7914627	0.917252289	**7.678958**	
Stanislaus	2022	T6 Utility Class 5	Aggregate	Aggregate	Diesel	23.12282537	942.03729	295.9721648	0.108474162	**8.684439**	
Stanislaus	2022	T6 Utility Class 6	Aggregate	Aggregate	Diesel	4.406126568	177.65541	56.39842007	0.02054157	**8.64858**	
Stanislaus	2022	T6 Utility Class 7	Aggregate	Aggregate	Diesel	5.036858124	247.64809	64.47178398	0.028305319	**8.749171**	
Stanislaus	2022	T6TS	Aggregate	Aggregate	Gasoline	594.480254	27343.987	11894.36092	6.00460959	**4.553833**	
Stanislaus	2022	T7 CAIRP Class 8	Aggregate	Aggregate	Diesel	1031.009941	211296.85	23692.60844	35.35444398	**5.976529**	
Stanislaus	2022	T7 NNOOS Class 8	Aggregate	Aggregate	Diesel	924.2730771	249818.02	21239.79531	41.80492946	**5.975803**	
Stanislaus	2022	T7 NOOS Class 8	Aggregate	Aggregate	Diesel	385.3096912	90754.451	8854.416704	15.27994522	**5.939449**	
Stanislaus	2022	T7 Other Port Class 8	Aggregate	Aggregate	Diesel	21.31768306	3679.4428	348.7572949	0.628882218	**5.850766**	
Stanislaus	2022	T7 POAK Class 8	Aggregate	Aggregate	Diesel	93.13144532	9147.9499	1523.630445	1.598920409	**5.721329**	
Stanislaus	2022	T7 POLA Class 8	Aggregate	Aggregate	Diesel	93.62133271	12224.86	1531.645003	2.137759845	**5.718537**	
Stanislaus	2022	T7 Public Class 8	Aggregate	Aggregate	Diesel	363.7509632	15257.143	1866.042441	2.988740278	**5.104874**	
Stanislaus	2022	T7 Single Concrete/Tr	Aggregate	Aggregate	Diesel	103.5139834	7254.1673	975.101724	1.244725835	**5.827924**	
Stanislaus	2022	T7 Single Dump Class	Aggregate	Aggregate	Diesel	177.3922425	10260.833	1671.034924	1.780880693	**5.761662**	
Stanislaus	2022	T7 Single Other Class	Aggregate	Aggregate	Diesel	594.9981087	33815.789	5604.882184	5.798269601	**5.832048**	
Stanislaus	2022	T7 SWCV Class 8	Aggregate	Aggregate	Diesel	112.4680919	7289.4377	517.3532229	2.876170228	**2.534425**	
Stanislaus	2022	T7 Tractor Class 8	Aggregate	Aggregate	Diesel	1701.616186	139351.64	24724.48319	23.10415151	**6.031455**	
Stanislaus	2022	T7 Utility Class 8	Aggregate	Aggregate	Diesel	15.82366044	745.69706	202.5428536	0.131079595	**5.688887**	
Stanislaus	2022	T7IS	Aggregate	Aggregate	Gasoline	5.33540938	102.82441	106.7508709	0.034115825	**3.01398**	
Stanislaus	2022	UBUS	Aggregate	Aggregate	Gasoline	18.570511	1036.1216	74.28204402	0.207982589	**4.981771**	
Stanislaus	2022	UBUS	Aggregate	Aggregate	Diesel	74.61786757	7815.7298	298.4714703	0.931347405	**8.391852**	

Source: EMFAC2021 (v1.0.1) Emissions Inventory
Region Type: County
Region: Stanislaus
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	Trips	Fuel Consumption	**MPG**		
Stanislaus	2023	All Other Buses	Aggregate	Aggregate	Diesel	109.1416796	5930.591435	971.3609483	0.684766065	**8.660755**		
Stanislaus	2023	LDA	Aggregate	Aggregate	Gasoline	185599.532	7279323.636	855533.9269	244.2187107	**29.80658**		
Stanislaus	2023	LDA	Aggregate	Aggregate	Diesel	528.015576	16506.47608	2244.98676	0.363680141	**45.38735**		
Stanislaus	2023	LDT1	Aggregate	Aggregate	Gasoline	18633.71555	583285.7518	79709.27373	23.68581785	**24.62595**		
Stanislaus	2023	LDT1	Aggregate	Aggregate	Diesel	12.86704141	145.8746957	37.52482813	0.0055883	**26.10359**		
Stanislaus	2023	LDT2	Aggregate	Aggregate	Gasoline	78865.47463	2994370.55	363618.6521	126.0239197	**23.76033**		
Stanislaus	2023	LDT2	Aggregate	Aggregate	Diesel	219.1935299	9155.20852	1041.598541	0.26969287	**33.94679**		
Stanislaus	2023	LHD1	Aggregate	Aggregate	Gasoline	9208.264848	327704.735	137189.4259	35.52846238	**9.223724**		
Stanislaus	2023	LHD1	Aggregate	Aggregate	Diesel	9381.022484	332927.6478	118001.4615	21.06434291	**15.80527**		
Stanislaus	2023	LHD2	Aggregate	Aggregate	Gasoline	1562.237281	58782.89759	23275.00775	6.901757663	**8.517091**		
Stanislaus	2023	LHD2	Aggregate	Aggregate	Diesel	3254.815739	122335.0516	40941.48744	9.431887969	**12.97037**		
Stanislaus	2023	MCY	Aggregate	Aggregate	Gasoline	10546.30132	57009.52529	21092.60264	1.367319081	**41.69438**		
Stanislaus	2023	MDV	Aggregate	Aggregate	Gasoline	80902.41319	2772635.008	363742.0249	143.6617777	**19.29974**		
Stanislaus	2023	MDV	Aggregate	Aggregate	Diesel	1219.237613	46758.69961	5669.359996	1.85547366	**25.20041**		
Stanislaus	2023	MH	Aggregate	Aggregate	Gasoline	1337.965651	11497.62112	133.8500837	2.607969891	**4.408648**		
Stanislaus	2023	MH	Aggregate	Aggregate	Diesel	564.3825557	4975.231058	56.43825557	0.528587377	**9.412315**		
Stanislaus	2023	Motor Coach	Aggregate	Aggregate	Diesel	24.15827492	3441.987779	555.1571577	0.628570505	**5.475898**		
Stanislaus	2023	OBUS	Aggregate	Aggregate	Gasoline	148.7815027	6373.555589	2976.820306	1.353004287	**4.710669**		
Stanislaus	2023	PTO	Aggregate	Aggregate	Diesel	0	10711.09224	0	2.225981595	**4.811851**		
Stanislaus	2023	SBUS	Aggregate	Aggregate	Gasoline	202.7119074	10228.7158	810.8476294	1.05198408	**9.723261**		
Stanislaus	2023	SBUS	Aggregate	Aggregate	Diesel	485.4705933	11205.15303	7029.614191	1.379581067	**8.122142**		
Stanislaus	2023	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	7.5804058	505.2111853	174.1977253	0.057124814	**8.843988**		
Stanislaus	2023	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	10.17710996	693.1309604	233.8699869	0.078265846	**8.85611**		
Stanislaus	2023	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	32.02504843	1810.042171	735.9356129	0.201543012	**8.980922**		
Stanislaus	2023	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	55.32102848	11360.95781	1271.277235	1.187611398	**9.566225**	**MHD**	
Stanislaus	2023	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	130.7661701	4395.789006	1866.033248	0.538855573	**8.157639**		**8.600338**
Stanislaus	2023	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	137.7361733	4710.470832	1965.495193	0.576101309	**8.176463**		
Stanislaus	2023	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	422.7409417	14596.59738	6032.513238	1.780152495	**8.199633**		
Stanislaus	2023	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	144.3636987	7981.280374	2060.069981	0.946302088	**8.434178**		
Stanislaus	2023	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	502.1169387	20770.71411	5804.471811	2.431256755	**8.543201**		
Stanislaus	2023	T6 Instate Other Class 5	Aggregate	Aggregate	Diesel	1004.575085	44418.54004	11612.88798	5.22355726	**8.503504**		
Stanislaus	2023	T6 Instate Other Class 6	Aggregate	Aggregate	Diesel	662.0084955	28105.24019	7652.818208	3.285437884	**8.554488**		
Stanislaus	2023	T6 Instate Other Class 7	Aggregate	Aggregate	Diesel	482.2258641	21895.45562	5574.530989	2.506243768	**8.736363**		
Stanislaus	2023	T6 Instate Tractor Class 6	Aggregate	Aggregate	Diesel	13.81024508	697.3257206	159.6464331	0.076672636	**9.094845**		
Stanislaus	2023	T6 Instate Tractor Class 7	Aggregate	Aggregate	Diesel	535.938182	33463.28352	6195.445384	3.679396643	**9.094775**		
Stanislaus	2023	T6 OOS Class 4	Aggregate	Aggregate	Diesel	4.370983563	288.7073773	100.4452023	0.03262216	**8.850039**		
Stanislaus	2023	T6 OOS Class 5	Aggregate	Aggregate	Diesel	5.843162999	396.0546052	134.2758857	0.044706836	**8.858927**	**HHD**	
Stanislaus	2023	T6 OOS Class 6	Aggregate	Aggregate	Diesel	18.44809079	1034.902015	423.9371264	0.115125841	**8.989311**		**7.122271**
Stanislaus	2023	T6 OOS Class 7	Aggregate	Aggregate	Diesel	30.00994499	7525.024536	689.6285358	0.782405648	**9.617804**		
Stanislaus	2023	T6 Public Class 4	Aggregate	Aggregate	Diesel	41.77415013	1359.619297	214.3013902	0.180995889	**7.511879**		
Stanislaus	2023	T6 Public Class 5	Aggregate	Aggregate	Diesel	112.0579675	4013.152441	574.8573732	0.524986117	**7.644302**		
Stanislaus	2023	T6 Public Class 6	Aggregate	Aggregate	Diesel	106.2378595	3609.211866	545.0002191	0.479482003	**7.527315**		
Stanislaus	2023	T6 Public Class 7	Aggregate	Aggregate	Diesel	163.7628074	7051.230221	840.103202	0.908188085	**7.764064**		
Stanislaus	2023	T6 Utility Class 5	Aggregate	Aggregate	Diesel	23.29888328	948.7152867	298.225706	0.107612592	**8.816025**		
Stanislaus	2023	T6 Utility Class 6	Aggregate	Aggregate	Diesel	4.424455953	178.9225446	56.6330362	0.020234238	**8.842564**		
Stanislaus	2023	T6 Utility Class 7	Aggregate	Aggregate	Diesel	5.047970593	249.1845322	64.61402359	0.028048659	**8.884009**		
Stanislaus	2023	T6TS	Aggregate	Aggregate	Gasoline	570.0968733	26942.83315	11406.49824	5.84942993	**4.606061**		
Stanislaus	2023	T7 CAIRP Class 8	Aggregate	Aggregate	Diesel	1055.190885	215416.6124	24248.28654	35.68586421	**6.036469**		
Stanislaus	2023	T7 NNOOS Class 8	Aggregate	Aggregate	Diesel	943.9257985	254974.5344	21691.41485	41.85781628	**6.091444**		
Stanislaus	2023	T7 NOOS Class 8	Aggregate	Aggregate	Diesel	395.3808984	92627.71924	9085.853046	15.37521736	**6.024482**		
Stanislaus	2023	T7 Other Port Class 8	Aggregate	Aggregate	Diesel	20.40024034	3828.241282	333.747932	0.645806379	**5.927847**		
Stanislaus	2023	T7 POAK Class 8	Aggregate	Aggregate	Diesel	93.27358471	9381.291931	1525.955846	1.611000219	**5.823272**		
Stanislaus	2023	T7 POLA Class 8	Aggregate	Aggregate	Diesel	97.71164183	12847.16267	1598.56246	2.208412749	**5.817374**		
Stanislaus	2023	T7 Public Class 8	Aggregate	Aggregate	Diesel	363.7301119	15308.41548	1865.935474	2.969982156	**5.15438**		
Stanislaus	2023	T7 Single Concrete/Transit Mix (	Aggregate	Aggregate	Diesel	104.0659271	7271.734709	980.3010337	1.238815049	**5.869912**		
Stanislaus	2023	T7 Single Dump Class 8	Aggregate	Aggregate	Diesel	176.9544704	10318.67017	1666.911111	1.786025662	**5.777448**		
Stanislaus	2023	T7 Single Other Class 8	Aggregate	Aggregate	Diesel	608.5539949	34567.55515	5732.578632	5.895604606	**5.863276**		
Stanislaus	2023	T7 SWCV Class 8	Aggregate	Aggregate	Diesel	110.6064773	7169.698737	508.7897956	2.804317665	**2.556664**		
Stanislaus	2023	T7 Tractor Class 8	Aggregate	Aggregate	Diesel	1782.068645	142088.0189	25893.45741	23.4260713	**6.06538**		
Stanislaus	2023	T7 Utility Class 8	Aggregate	Aggregate	Diesel	16.23049844	751.1584997	207.75038	0.129810816	**5.786563**		
Stanislaus	2023	T7IS	Aggregate	Aggregate	Gasoline	4.036315857	85.9260747	80.75860766	0.027514948	**3.122887**		
Stanislaus	2023	UBUS	Aggregate	Aggregate	Gasoline	18.71002833	1043.905782	74.84011332	0.209540287	**4.981886**		
Stanislaus	2023	UBUS	Aggregate	Aggregate	Diesel	71.36802862	7758.148358	285.4721145	0.916268503	**8.467112**		

On-road Mobile (Operational) Energy Usage

Unmitigated:

Step 1:

Therefore:

Average Daily VMT:

4,528 Source: Fehr & Peers

Step 2: Given:

Fleet Mix (CalEEMod Output)

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
53.43%	20.30%	16.73%	5.45%	0.13%	0.09%	0.86%	2.07%	0.00%	0.44%	0.25%	0.07%	0.18%

And:

Gasoline MPG Factors for each Vehicle Class - Year 2023 (EMFAC2021 Output)

LDA	LDT1	LDT2	MDV	MCY	MH
29.807	24.626	23.760	19.300	41.694	4.409

Diesel MPG Factors for each Vehicle Class - Year 2023 (EMFAC2021 Output)

LHD1	LHD2	MHD	HHD	OBUS	UBUS	SBUS
15.805	12.970	8.600	7.122	4.711	8.467	8.122

Therefore:

Weighted Average MPG Factors

Gasoline: **27.1** Diesel: **7.1**

Step 3: **Therefore:**

161 daily gallons of gasoline **23 daily gallons of diesel**

or

58,859 annual gallons of gasoline **8,539 annual gallons of diesel**

Off-road Mobile (Construction) Energy Usage

Note: For the sake of simplicity, and as a conservative estimation, it was assumed that all off-road vehicles use diesel fuel as an energy source.
Demolition (if applicable), Site preparation and grading off-road mobile vehicle on-site gallons of fuel are calculated below.

Given Factor:	**99.3**	**metric tons**	**CO_2**	**(provided in CalEEMod Output File)**
Conversion Factor:	2204.6262	pounds	per metric ton	
Intermediate Result:	**218,959**	**pounds**	**CO_2**	
Conversion Factor:	22.38	pounds	CO_2 per 1 gallon of diesel fuel	Source: U.S. EIA, 2016
Final Result:	**9,784**	**gallons**	**diesel fuel**	http://www.eia.gov/tools/faqs/faq.cfm?id=307&t=11

Mitigated Onsite Scenario	Total CO_2 (MT/yr) (provided in CalEEMod Output File)
Demolition	34.23
Site Preparation	16.85
Grading	82.4632

On-road Mobile (Construction) Energy Usage - Demolition

Note: Year 2021 MPG factors were derived for construction-releated energy consumption (for the sake of a conservative estimate).

Step 1: **Total Daily Worker Trips (CalEEMod output)**

15

Worker Trip Length (miles) (CalEEMod output)

10.8

Therefore:

Average Worker Daily VMT:

162

Step 2: Given:

Assumed Fleet Mix for Workers (Percentage mix is provided on Appendix A: Calculation Details for CalEEMOD p. 15)

LDA	**LDT1**	**LDT2**
0.5	0.25	0.25

And:

Gasoline MPG Factors for each Vehicle Class - Year 2022 (EMFAC2021 output)

LDA	**LDT1**	**LDT2**
29.33	24.26	23.25

Therefore:

Weighted Average Worker MPG Factor

26.54

Step 3: **Therefore:**

6 Worker daily gallons of gasoline (all workers)

Step 4: 20 **# of Days (CalEEMod ouput)**

Therefore:

Result: 122 Total gallons of gasoline (all workers)

Total Hauler Trips (CalEEMod Output)

47

Note: Hauler trips are total values (not daily).

Hauler Trip Length (miles) (CalEEMod Output)

20

Average Hauler Daily VMT:

940

Fleet Mix for Workers (CalEEMod Output)

MHD	**HHD**
0%	100%

Diesel MPG Factors for each Vehicle Class - Year 2022 (EMFAC2021 output)

MHD	**HHD**
8.54	7.03

Therefore:

Weighted Average Hauler (Diesel) MPG Factor

7.03

Therefore:

134 Worker daily gallons of gasoline (all workers)

Therefore:

Result: 134 Hauler gallons of diesel

On-road Mobile (Construction) Energy Usage - Site Preparation

Note: Year 2021 MPG factors were derived for construction-releated energy consumption (for the sake of a conservative estimate).

Step 1: **Total Daily Worker Trips (CalEEMod Output)**

18

Worker Trip Length (miles) (CalEEMod Output)

10.8

Therefore:

Average Worker Daily VMT:

194

Step 2: Given:

Assumed Fleet Mix for Workers (Percentage mix is provided on Appendix A: Calculation Details for CalEEMOD p. 15)

LDA	**LDT1**	**LDT2**
0.5	0.25	0.25

And:

Gasoline MPG Factors for each Vehicle Class (EMFAC2021 Output) - Year 2022

LDA	**LDT1**	**LDT2**
29.33	24.26	23.25

Therefore:

Weighted Average Worker MPG Factor

26.5

Step 3: **Therefore:**

7.3 Worker daily gallons of gasoline

Step 4: 10 **# of Days (CalEEMod Output)**

Therefore:

Result: **73 Total gallons of gasoline**

On-road Mobile (Construction) Energy Usage - Grading

Note: Year 2021 MPG factors were derived for construction-releated energy consumption (for the sake of a conservative estimate).

Step 1: **Total Daily Worker Trips (CalEEMod Output)**

20

Worker Trip Length (miles) (CalEEMod Output)

10.8

Therefore:

Average Worker Daily VMT:

216

Step 2: Given:

Assumed Fleet Mix for Workers (Percentage mix is provided on Appendix A: Calculation Details for CalEEMOD p. 15)

LDA	**LDT1**	**LDT2**
0.5	0.25	0.25

And:

Gasoline MPG Factors for each Vehicle Class (EMFAC2021 Output) - Year 2022

LDA	**LDT1**	**LDT2**
29.33	24.26	23.25

Therefore:

Weighted Average Worker MPG Factor

26.5

Step 3: **Therefore:**

8.1 Worker daily gallons of gasoline

Step 4: 30 **# of Days (CalEEMod Output)**

Therefore:

Result: **244 Total gallons of gasoline**

On-road Mobile (Construction) Energy Usage - Building Construction

Note: Year 2021 MPG factors were derived for construction-releated energy consumption (for the sake of a conservative estimate).

Step 1:

Total Daily Worker Trips (CalEEMod Output)
25

Total Daily Vendor Trips (CalEEMod Output)
7

Worker Trip Length (miles) (CalEEMod Output)
10.8

Vendor Trip Length (miles) (CalEEMod Output)
7.3

Therefore:
Average Worker Daily VMT:
270

Therefore:
Average Vendor Daily VMT:
51

Step 2:

Given:
Assumed Fleet Mix for Workers (Percentage mix is provided on Appendix A: Calculation Details for CalEEMOD p. 15)

LDA	LDT1	LDT2
0.5	0.25	0.25

Assumed Fleet Mix for Vendors

Fleet Mix for Workers (CalEEMod Output)

MHD	HHD
0%	100%

And:
MPG Factors for each Vehicle Class (from EMFAC2021) - Year 2022

Gasoline:

LDA	LDT1	LDT2
29.33	24.26	23.25

Diesel:

MHD	HHD
8.54	7.03

Therefore:
Weighted Average Worker (Gasoline) MPG Factor
26.5

Weighted Average Vendor (Diesel) MPG Factor
7.0

Step 3:

Therefore:
10 Worker daily gallons of gasoline

Therefore:
7 Vendor daily gallons of diesel

Step 4:

170 **# of Days (CalEEMod Output)**

Therefore:
1,729 Total gallons of gasoline

Therefore:
1,235 Total gallons of diesel

On-road Mobile (Construction) Energy Usage - Paving

Note: Year 2021 MPG factors were derived for construction-releated energy consumption (for the sake of a conservative estimate).

Step 1: **Total Daily Worker Trips (CalEEMod Output)**

15

Worker Trip Length (miles) (CalEEMod Output)

10.8

Therefore:

Average Worker Daily VMT:

162

Step 2: Given:

Assumed Fleet Mix for Workers (Percentage mix is provided on Appendix A: Calculation Details for CalEEMOD p. 15)

LDA	LDT1	LDT2
0.5	0.25	0.25

And:

Gasoline MPG Factors for each Vehicle Class (EMFAC2021 Output) - Year 2022

LDA	LDT1	LDT2
29.33	24.26	23.25

Therefore:

Weighted Average Worker MPG Factor

26.5

Step 3: **Therefore:**

6.1 Worker daily gallons of gasoline

Step 4: 20 **# of Days (CalEEMod Output)**

Therefore:

Result: **122** **Total gallons of gasoline**

On-road Mobile (Construction) Energy Usage - Architectural Coating

Note: Year 2021 MPG factors were derived for construction-releated energy consumption (for the sake of a conservative estimate).

Step 1: **Total Daily Worker Trips (CalEEMod Output)**

5

Worker Trip Length (miles) (CalEEMod Output)

10.8

Therefore:

Average Worker Daily VMT:

54

Step 2: Given:

Assumed Fleet Mix for Workers (Percentage mix is provided on Appendix A: Calculation Details for CalEEMOD p. 15)

LDA	LDT1	LDT2
0.5	0.25	0.25

And:

Gasoline MPG Factors for each Vehicle Class (EMFAC2021 Output) - Year 2022

LDA	LDT1	LDT2
29.33	24.26	23.25

Therefore:

Weighted Average Worker MPG Factor

26.5

Step 3: **Therefore:**

2.0 Worker daily gallons of gasoline

Step 4: 20 **# of Days (CalEEMod Output)**

Therefore:

Result: **41 Total gallons of gasoline**

APPENDIX C

Greenhouse Gas Efficiency Metric Methodology

Greenhouse Gas Efficiency Metric Calculation Methodology – Stanislaus County – Monte Vista Subdivision

The methodology used for assessing the proposed project's consistency with GHG targets established in AB 32 is the use of GHG efficiency metrics to assess the GHG efficiency of the project on a "service population (SP)" basis (the sum of the number of jobs and the number of residents provided by a project). These metrics represent the rate of emissions needed to achieve a fair share of the state's emissions mandate embodied in AB 32. The use of "fair share" in this instance indicates the GHG efficiency level that, if applied statewide, would meet the AB 32 emissions target and support efforts to reduce emissions beyond 2020.

GHG efficiency metrics for the project were developed based on emissions rates for the land use-driven emission sectors in the CARB's GHG inventory. The GHG efficiency metric is only based on sectors that would accommodate projected growth (as indicated by population and employment growth) while allowing for consistency with the goals of AB 32 (i.e., 1990 GHG emissions levels by 2020). The per service population efficiency target is based on the AB 32 GHG reduction target and GHG emissions inventory prepared for the CARB's 2008 Scoping Plan.

To develop the efficiency metric for 2020, land-use driven sectors in the CARB's 1990 GHG inventory were identified and separated to tailor the inventory to land use projects. This process removes emission sources that would not be applicable to the project area. For example, emissions associated with ships and commercial boats, aviation, rail, industrial sources, agriculture and forestry, and unspecified sectors were removed from the CARB's 1990 inventory in order to exclude non-land use sectors. The exceptions for the industrial sector are the landfill and domestic wastewater sub-sectors which were included in development of the GHG efficiency metric because emissions from these sectors are included in the project's emissions profile. Isolating the land use-driven sectors from the CARB's overall inventory ensures that the threshold is directly applicable to land use projects, whereby emission sectors included in the inventory used for developing the GHG efficiency metric can be mapped to a project's emissions data. For example, emissions associated with on-road transportation, electricity, natural gas, wastewater treatment, and solid waste are included in both the inventory used to develop the GHG efficiency metric and the project's operational emissions. The CARB's complete 1990 inventory and the adjusted land use-driven emissions inventory are shown on the following pages.

The land-use sector driven inventory for 1990 was divided by the population and employment projections for California in 2020. Detailed calculations showing derivation of the efficiency metrics are shown on the following pages. The efficiency metric allows the threshold to be applied evenly to all project types (residential, commercial/retail and mixed use) and uses an emissions inventory comprised only of sources from land-use related sectors. The efficiency approach allows lead agencies to assess whether any given project or plan would accommodate population and employment growth in a way that is consistent with the emissions limit established under AB 32. The resultant GHG efficiency metric would be (approximately) 4.84 MT CO_2e/SP/year for 2020 (as provided below).

The proposed project is anticipated to be built out in year 2023. The CARB has indicated that an average statewide GHG reduction of 5.2 percent per year would be necessary to achieve the 2030 target[1,2]. Therefore, a GHG efficiency goal in terms of metric tons per service population, similar to the one developed for 2020, were estimated for year 2023, allow evaluation of the project's GHG emissions in the post-2020 landscape. The equivalent goal for 2023 computes to approximately 4.02 MT CO_2e/SP/year. This targets was estimated by applying a uniform reduction from the CARB's 1990 emissions inventory and dividing the resultant value by the projected population and employment in these future years.

These GHG efficiency metric were derived based on the reduction trajectory the state needs to maintain to achieve its 2030 and 2050 goals (an approximately 5.2 percent reduction per year) (CARB, 2016b). All calculations are based on the IPCC Second Assessment Report's Global Warming Potentials to allow consistent comparison between the ARB 1990 inventory and the California Emissions Estimator Model (CalEEMod; used to estimate project emissions).

---

[1] California Air Resources Board. 2016. California Climate Strategy. January 29, 2016. Available at: http://docketpublic.energy.ca.gov/PublicDocuments/15-RETI-02/TN210091_20160129T154626_California_Climate_Strategy_CARB_for_RETI_20_Plenary_Meeting_on.pdf

[2] California Air Resources Board. 2015. 2030 Target Scoping Plan Workshop Slides. (October 1, 2015). Available at: http://www.arb.ca.gov/cc/scopingplan/meetings/10_1_15slides/2015slides.pdf

California Greenhouse Gas Inventory for 1990 – by Sector and Activity (Land Use-driven sectors only)
Million metric tons of CO_2-equiavlent (CO_2e) – (based on IPCC Second Assessment Report's Global Warming Potentials) (CARB, 2007).

Year 1990

Transportation	
On Road	
Passenger Cars	63.77
Light Duty Trucks	44.75
Motorcycles	0.43
Heavy Duty Trucks	29.03
Freight	0.02
Electricity Generation In-State	
CHP: Commercial	***0.70***
Merchant Owned	***2.33***
Transmission and Distribution	***1.56***
Utility Owned	***29.92***
Electricity Generation In-State	
Specified Imports	***29.61***
Transmission and Distribution	***1.02***
Unspecified Imports	***30.96***
Commercial	
CHP: Commercial	***0.40***
Communication	***0.07***
Domestic Utilities	***0.34***
Education	***1.42***
Food Services	***1.89***
Healthcare	***1.32***
Hotels	***0.67***
Not Specified Commercial	***5.58***
Offices	***1.46***
Retail & Wholesale	***0.68***
Transportation Services	***0.03***
Residential	
Household Use	***29.66***
Industrial	
Landfills	***6.26***
Wastewater Treatment	
Domestic Wastewater	2.83
Total Emissions	**286.70**

Future Year Service Population Thresholds

	2020	2023	2030	2050
Population	40,719,999	41,709,953	44,019,846	49,158,401
Employment	18,511,200	18,961,230	20,011,301*	22,347,274*
Service Population	59,231,199	60,671,184	64,031,147	71,505,675
Emissions (Million Metric Tons)	286.70	244.08	167.67	57.35
MT/SP	**4.84**	**4.02**	**2.62**	**0.80**

Notes:

SP = service population.

*Assumes proportion of employed persons to the overall population remains equal to that as was applicable in 2020.

Post-2020 Emissions are based on an annual 5.2% reduction from 2020 (CARB, 2016).

Sources:

California Air Resources Board (CARB). 2007. Staff Report: California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit. Public Release Date: November 16, 2007. Available: https://www.arb.ca.gov/cc/inventory/1990level/1990level.htm

California Air Resources Board (CARB). 2015. 2030 Target Scoping Plan Workshop Slides. (October 1, 2015). Available: http://www.arb.ca.gov/cc/scopingplan/meetings/10_1_15slides/2015slides.pdf

California Air Resources Board (CARB). 2016. California Climate Strategy. January 29, 2016. Available at: http://docketpublic.energy.ca.gov/PublicDocuments/15-RETI-02/TN210091_20160129T154626_California_Climate_Strategy_CARB_for_RETI_20_Plenary_Meeting_on.pdf

California Department of Finance, Demographics Research Unit (Total Estimated and Projected Population for California and Counties: July 1, 2010 to July 1, 2060 in 5-year Increments. Published February, 2017.

California Department of Finance Employment Development Department. Industry Employment Projections Labor Market Information Division 2010-2020. Published 5/23/2012.

APPENDIX D

Analysis of Models and Tools for Correlating Project-Generated Emissions to Health End Points

APPENDIX D

ANALYSIS OF MODELS AND TOOLS TO CORRELATE PROJECT-GENERATED CRITERIA POLLUTANT EMISSIONS TO HEALTH END POINTS

TOOL	CREATED BY	DESCRIPTION	RESOLUTION	POLLUTANTS ANALYZED	PROJECT-LEVEL CEQA APPLICABILITY
AERMOD Modeling System[1,2]	AERMIC	A steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. The modeling system incorporates air dispersion based on a planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain.	Project-level	SO_2, ROG, NO_2, Lead, $PM_{2.5}$, PM_{10}, NH_3	This model operates at the project-level and provides air dispersion modeling for a project's emissions on the surrounding environment. However, even with supplementary (i.e. additional software), the model cannot estimate specific health effects on receptors from the air dispersion modeling. Moreover, it cannot model the (complex) chemical reactions that occur between the ozone precursors (e.g. NOx and ROG) that generate ozone. Therefore, this model is not recommended for project-level CEQA analysis.
AirCounts[3]	Abt Assoc.	Online tool that helps large and medium-sized cities quickly estimate the health benefits of $PM_{2.5}$ emission reductions and economic value of those benefits. The tool estimates the number of deaths (mortality) avoided and economic value related to user-specified regional, annual $PM_{2.5}$ emissions reduction.	City-level	Primary $PM_{2.5}$	This tool is only illustrative, as it is limited to certain cities and does not target specific sectors. The tool is not sector specific, and includes limited California data. It cannot provide results at a project-level. Therefore, the tool is not recommended for project-level CEQA analysis.
Air Pollution Emission Experiments and Policy analysis (APEEP) model[4]	Mueller and Mendelsohn2006, 2009	The Air Pollution Emission Experiments and Policy (APEEP) analysis model (Muller and Mendelsohn 2006, 2009) is a traditional integrated assessment model. Like other integrated assessment models, APEEP connects emissions of air pollution through air-quality modeling to exposures, physical effects, and monetary damages. Making these links requires the use of findings reported in the peer-reviewed literature across several scientific disciplines. The air-quality models in APEEP use the emission data provided by EPA to estimate corresponding ambient concentrations in each county in the coterminous states.	National or county-level	SO_2, ROG, NO_x, Ozone, $PM_{2.5}$, PM_{10}	The model operates at the national scale but may be applied at the county-level (although it is not clear how this adjustment should be made). It cannot provide results at a project-level. The tool is also not commercially available. Therefore, the tool is not recommended for project-level CEQA analysis.

[1] See: https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models
[2] Note: May require additional software to estimate the level of each specific pollutant at the modeled receptors.
[3] See: https://www.abtassociates.com/tools
[4] See: https://public.tepper.cmu.edu/nmuller/APModel.aspx

TOOL	CREATED BY	DESCRIPTION	RESOLUTION	POLLUTANTS ANALYZED	PROJECT-LEVEL CEQA APPLICABILITY
CALINE3/ CAL3QHC/ CAL3QHCR[1, 2]	USEPA	A steady-state Gaussian dispersion model designed to determine air pollution concentrations at receptor locations downwind of highways located in relatively uncomplicated terrain. CALINE3 is incorporated into the more refined CAL3QHC and CAL3QHCR models. CAL3QHCR is a more refined version based on CAL3QHC that requires local meteorological data.	Project-level	SO_2, ROG, NO_2, Lead, $PM_{2.5}$, PM_{10}	This model operates at the project-level and provides air dispersion modeling for a project's emissions on the surrounding environment. However, even with supplementary (i.e. additional software), the model cannot estimate specific health effects on receptors from the air dispersion modeling. Moreover, it cannot model the (complex) chemical reactions that occur between the ozone precursors (e.g. NOx and ROG) that generate ozone. Therefore, this model is not recommended for project-level CEQA analysis.
Complex Terrain Dispersion Model Plus Algorithms for Unstable Situations (CTDMPLUS)[1, 2]	USEPA	A refined point source gaussian air quality model for use in all stability conditions for complex terrain. The purpose of the model is to provide a practical, refined plum model for elevated point sources near complex terrain.	Project-level	SO_2, ROG, NO_2, Lead, $PM_{2.5}$, PM_{10}	This model operates at the project-level and provides air dispersion modeling for a project's emissions on the surrounding environment. However, even with supplementary (i.e. additional software), the model cannot estimate specific health effects on receptors from the air dispersion modeling. Moreover, it cannot model the (complex) chemical reactions that occur between the ozone precursors (e.g. NOx and ROG) that generate ozone. Therefore, this model is not recommended for project-level CEQA analysis.
Co-Benefits Risk Assessment (COBRA)[5]	USEPA	Preliminary screening tool that contains baseline emission estimates of a variety of air pollutants for a single year. COBRA is targeted to state and local governments as a screening assessment for clean energy policies. EPA's CO–Benefits Risk Assessment (COBRA) screening model is a free tool that helps state and local governments: • Explore how changes in air pollution from clean energy policies and programs; • Estimate the economic value of the health benefits associated with clean energy policies and programs to compare against program costs; • Map and visually represent the air quality, human health, and health-related economic benefits from reductions in emissions of particulate matter ($PM_{2.5}$), sulfur dioxide ($S0_2$), nitrogen oxides (NO_X), ammonia (NH_3), and volatile organic compounds (VOCs) that result from clean energy policies and programs.	National, regional, state, or county-levels	$PM_{2.5}$, SO_2, NO_x, NH_3, and ROG	COBRA is a preliminary screening tool only and cannot be used at sub-county resolution. It cannot provide results at a project-level. It also does not account for secondary emission changes resulting from market responses. Accordingly, the tool is not recommended for project-level CEQA analysis.

5 See: https://www.epa.gov/statelocalenergy/co-benefits-risk-assessment-cobra-health-impacts-screening-and-mapping-tool

Tool	Created by	Description	Resolution	Pollutants Analyzed	Project-level CEQA Applicability
Environmental Benefits and Mapping Program-Community Edition (BenMAP-CE)[6]	USEPA	The USEPA's detailed model for estimating the health impacts from air pollution. It relies on input concentrations and applies concentration-response (C-R) health impact functions, which relate a change in the concentration of a pollutant with a change in the incidence of a health endpoint, including premature mortality, heart attacks, chronic respiratory illnesses, asthma exacerbation and other adverse health effects. Detailed inputs are required for air quality changes (concentrations from AERMOD), population, baseline incidence rates, and effect estimates.	National, County, City, and sub-regional levels	Ozone, PM, NO_2, SO_2, CO	This tool is not well suited to analyze small or localized changes in pollutant concentrations associated with individual projects. Although this tool is under consideration by some California air districts for use towards project-level analysis, no air district in California has promulgated a methodology (using this tool or any other) that would correlate the expected air quality emissions of projects to the likely health consequences of the increased emissions. Accordingly, the tool is not recommended.
Fast Scenario Screening Tool (TM5-FASST)[7]	Joint Research Centre (Italy)	A tool that allows users to evaluate how air pollutant emissions affect large scale pollutant concentrations and their impact on human health (mortality and years of life lost) and crop yield from national to regional air quality policies, such as climate policies. The target policy domains are national to regional air quality policies, or air pollutant scenarios linked to other policy domains (e.g. climate policy). The tool is web-based and does not require coding or modelling. Users must gain access through publishers.	Global and national-levels	$PM_{2.5}$, Ozone, NO_x, NH_3, CO, ROG, CH_4, SO_2	This tool is applicable at national to global scales. It cannot provide results a project-level. Accordingly, the tool is not recommended for project-level CEQA analysis.
Long-range Energy Alternatives Planning System-Integrated Benefits Calculator (LEAP-IBC)[8]	Climate and Clean Air Coalition (CCAC)	A calculator that allows users to rapidly estimate the impacts of reducing emissions on health, climate, and agriculture. The tool uses sensitivity coefficients that link gridded emissions of air pollutants and precursors to health, climate and agricultural impacts at a national level. The tool is primarily used for policy analysis. The tool is currently Excel-based and is available through the developers only. A web-based interface is currently under development.	National-level	$PM_{2.5}$, Ozone, NO_2	This tool is applicable at national scale. Accordingly, the tool is not recommended for project-level CEQA analysis.
Methodology for Estimating Premature Deaths Associated with Long-Term Exposure to Fine Airborne Particulate Matter in California[9]	California Air Resources Board	The staff report identifies a relative risk of premature death associated with $PM_{2.5}$ exposure based on a review of all relevant scientific literature, and a new relative risk factor was developed. This new factor is a 10% increase in risk of premature death per 10 μg/m³ increase in exposure to $PM_{2.5}$ concentrations (uncertainty interval: 3% to 20%)	National	$PM_{2.5}$	The primary author of the CARB staff report notes that the analysis method is not suited for small projects and may yield unreliable results due to various uncertainties. The tool also cannot provide results on a project-level. Accordingly, the tool is not recommended for project-level CEQA analysis.

6 See: https://www.epa.gov/benmap

7 See: http://tm5-fasst.jrc.ec.europa.eu/

8 See: https://www.ccacoalition.org/en/resources/long-range-energy-alternatives-planning-integrated-benefits-calculator-leap-ibc-factsheet

9 See: https://ww3.arb.ca.gov/research/health/pm-mort/pmmortalityreportfinalr10-24-08.pdf

Tool	Created by	Description	Resolution	Pollutants Analyzed	Project-level CEQA Applicability
Multi-Pollutant Evaluation Method (MPEM)[10]	BAAQMD	Estimates the impacts of control measures on pollutant concentration, population exposures, and health outcomes for criteria, toxic, and GHG pollutants. Monetizes the value of total health benefits from reductions in $PM_{2.5}$, ozone, and certain carcinogens, and the social value of GHG reductions. MPEM was designed for development of a Clean Air Plan for the San Francisco Bay Area. The inputs are specific to the SF region and are not appropriate for projects outside BAAQMD.	Regional level in the SFBAAB	Ozone, PM, air toxics, GHG	This tool is designed to support the BAAQMD in regional planning and emissions analysis within the San Francisco Bay Area Air Basin (SFBAAB). The model applies changes in pollutant concentrations over a four-square kilometer grid. The tool also cannot provide results on a project-level. Additionally, this tool is only applicable for the SFBAAB. Accordingly, the tool is not recommended for project-level CEQA analysis.
Offshore and Coastal Dispersion Model Version 5 (OCD)[1,2]	USEPA	A straight-line Gaussian model developed to determine the impact of offshore emissions from point, area or line sources on the air quality of coastal regions. OCD incorporates overwater plume transport and dispersion as well as changes that occur as the plume crosses the shoreline. Hourly meteorological data are needed from both offshore and onshore locations.	Project-level	SO_2, ROG, NO_2, Lead, $PM_{2.5}$, PM_{10}	This model operates at the project-level and provides air dispersion modeling for a project's emissions on the surrounding environment. However, even with supplementary (i.e. additional software), the model cannot estimate specific health effects on receptors from the air dispersion modeling. Moreover, it cannot model the (complex) chemical reactions that occur between the ozone precursors (e.g. NOx and ROG) that generate ozone. Therefore, this model is not recommended for project-level CEQA analysis.
Response Surface Model (RSM)-based Benefit-per-Ton Estimates[11]	USEPA	Consists of tables reporting the monetized $PM_{2.5}$-related health benefits from reducing $PM_{2.5}$ precursors from certain source types nationally and for 9 US cities/regions. Applying these estimates simply involves multiplying the emissions reduction by the relevant benefit per-ton metric. The resulting value is the PM mortality risk estimate at a 3% discount rate.	National or regional (San Joaquin County only) levels	SOx, VOC, NH_3, NO_x	RSM includes regional values specific to San Joaquin County. The values are also dated. Accordingly, the tool is not recommended for project-level CEQA analysis.
Sector-based Benefit-per-Ton Estimates[12]	USEPA	Two specific sets of Benefit-per-ton (BPT) estimates for 17 key source categories are available. Both are a reduced-form approach based on BenMAP modeling. Applying these factors involves multiplying the emissions reduction (in tons) by the relevant benefit (economic value) or incidence (rates of mortality and morbidity) per-ton metric. The resulting value is the economics, mortality, and morbidity of direct and indirect $PM_{2.5}$ emissions.	National-scale	$PM_{2.5}$, SO_2, NO_x	The BPT estimates do not account for project-specific emissions or receptor locations, local dispersion characteristics, or regional photochemistry. The resultant health effects are therefore reflective of national averages and may not be accurate when applied to the project-level. Accordingly, the tool is not recommended for project-level CEQA analysis.

10 See: http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/mpem_nov_dec_2016-pdf.pdf?la=en

11 See: https://www.epa.gov/benmap/response-surface-model-rsm-based-benefit-ton-estimates

12 See: https://www.epa.gov/benmap/sector-based-pm25-benefit-ton-estimates. The updated Technical Support Document (February 2018) is available at: https://www.epa.gov/sites/production/files/2018-02/documents/sourceapportionmentbpttsd_2018.pdf

APPENDIX E

Traffic Study

Draft Transportation Impact Assessment

Monte Vista Collection Subdivision

OCTOBER 15, 2021

PREPARED FOR

LAZARES COMPANIES

STANISLAUS COUNTY

BTC

BARRIOS TRANSPORTATION CONSULTING

Draft Transportation Impact Assessment

Monte Vista Collection Subdivision

Prepared for:
Lazares Companies
Stanislaus County

Prepared By:

BTC
BARRIOS
TRANSPORTATION CONSULTING

October 15, 2021

BTC-0017

Table of Contents

Appendices

List of Figures

List of Tables

1.0 INTRODUCTION

This report presents the analysis and findings of the Transportation Impact Assessment (TIA) for the Monte Vista Collection Subdivision (project) located in the community of Denair, Stanislaus County. This chapter discusses the TIA purpose, study locations and analysis scenarios, analysis methods, and report organization.

1.1 STUDY PURPOSE AND PROJECT DESCRIPTION

The study's purpose is to evaluate the transportation impacts of the project, a residential development. The project, located in the Stanislaus County community of Denair, proposes to construct 69 single-family residential units on an 18.61-acre parcel that is currently occupied by two residential units and accessory buildings (i.e., barn and garage). The parcel is located on the north side of Monte Vista Avenue between Waring Road and Lester Road. The project location is presented in **Figure 1-1**. The tentative subdivision map is presented in **Appendix A**. Vehicular access would be provided by a single access point on Monte Vista Avenue.

1.2 STUDY LOCATIONS AND ANALYSIS SCENARIOS

The following intersections were evaluated for the peak hour in the morning between 7:00 and 9:00 AM and evening between 4:00 and 6:00 PM:

1. Waring Road / Monte Vista Avenue
2. Lester Road / Main Street

In addition to peak hour intersection operations analysis, a daily roadway segment analysis was conducted for the following roadway segment:

1. Monte Vista Avenue between Waring Road and Lester Road

BTC

Figure 1-1

Project Vicinity Map

The following scenarios were evaluated:

- ***Existing*** – Existing conditions based on recent traffic counts.
- ***Existing Plus Project*** – Existing traffic counts plus traffic expected to be generated by the project
- ***Cumulative No Project*** – Forecasts for the cumulative scenario (year 2035) based on an annual traffic growth factor from the Three-County Travel Demand Model
- ***Cumulative with Project*** – Cumulative No Project forecasts plus traffic expected to be generated by the project

1.3 ANALYSIS METHODS

While vehicle miles of travel (VMT) are currently used and required within California for environmental assessments, Stanislaus County still has a policy to maintain level of service (LOS) C or better operations at intersections during the peak hour and LOS D or better on roadways (Daily LOS). These policies are in place to ensure that adequate traffic circulation and mobility are provided in Stanislaus County.

LOS is a qualitative description of traffic flow from a vehicle driver's perspective based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined ranging from LOS A (free-flow conditions) to LOS F (over capacity conditions). LOS E corresponds to operations "at capacity." When volumes exceed capacity, stop-and-go conditions result, and operations are designated LOS F. **Appendix B** provides a detailed discussion on the LOS criteria used to evaluate signalized and unsignalized intersections for the peak hour and roadways for a daily condition.

1.3.1 VEHICLE MILES OF TRAVEL

In response to Senate Bill 743 (SB 743), the Office of Planning and Research (OPR) has updated the California Environmental Quality Act (CEQA) guidelines to include new transportation-related evaluation metrics. Within California, VMT is the transportation metric for determining project impacts for CEQA: the metric was previously LOS. For this study a preliminary assessment of VMT generated by the proposed project was prepared for informational purposes only as Stanislaus County has not yet adopted significance thresholds related to VMT.

1.4 REPORT ORGANIZATION

This report is divided into 7 chapters as described below:

- **Chapter 1 – Introduction** discusses the purpose and organization of the report.

- **Chapter 2 – Existing Conditions** describes the transportation system in the project vicinity, including the surrounding roadway network morning and evening peak period intersection turning movement volumes, existing bicycle and pedestrian facilities, and intersection operations.
- **Chapter 3 – Project Characteristics** presents relevant project information, such as the project components and project trip generation, distribution, and assignment.
- **Chapter 4 – Existing Plus Project Traffic Conditions** addresses the existing conditions with the project.
- **Chapter 5 – Cumulative Traffic Conditions** addresses the future conditions (2035), both without and with the project.
- **Chapter 6 – Vehicle Miles of Travel** presents the results of the VMT assessment conducted for the site.
- **Chapter 7 – Site Plan Review** describes project access and circulation for all travel modes, including an assessment of traffic control at the internal intersections.

2.0 EXISTING CONDITIONS

This chapter describes the transportation facilities in the project study area, including the surrounding roadway network, pedestrian, and bicycle facilities in the project site vicinity. Existing intersection operations are also described.

2.1 ROADWAY SYSTEM

The following discusses the roadways that would provide access to the site and/or are most likely to experience direct traffic impacts, if any, from the proposed project.

Monte Vista Avenue is an east-west two-lane minor arterial in the vicinity of the project. Monte Vista Avenue connects Denair to Turlock and SR 99 to the west and rural Stanislaus County to the east. The posted speed limit in the vicinity of the project site is 50 mph.

Main Street is a two-lane minor arterial that provides primary east-west access through Denair. Main Street extends from the Monte Vista Avenue-Main Street junction and continues easterly past Santa Fe Avenue to Gratton Road where it terminates. The posted speed limit is 35 mph (25 mph when school children are present).

Waring Road is a north-south two-lane major collector that terminates at Taylor Road to the north and Hawkeye Avenue to the south. The posted speed limit is 40 mph.

Lester Road is a north-south two-lane major collector that extends from Hawkeye Avenue to the south to past Zeering Road to the north where it terminates. The posted speed limit is 25 mph in the project vicinity.

2.2 EXISTING PEDESTRIAN AND BICYCLE FACILITIES

2.2.1 PEDESTRIAN FACILITIES

Pedestrian facilities typically include sidewalks, crosswalks, pedestrian signals and multi-use trails. Between Waring Road and Lester Road, sidewalk is currently provided on the north and south side of Monte Vista Avenue near the intersections. However, there is a large gap in the sidewalk system (over 1,000’ gap) on both sides of Monte Vista Avenue between Waring Road and Lester Road. There is no sidewalk along the proposed project’s frontage. Crosswalks are not provided at the intersection of Monte

Vista Avenue with Waring Road. Crosswalks and pedestrian signals are provided on all legs of the Monte Vista Avenue/Lester Road intersection. The crosswalks are painted yellow to alert drivers that they are in a school zone. There are no multi-use trails in the vicinity of the project.

2.2.2 BICYCLE FACILITIES

Bicycle facilities include the following:

- **Bike paths (Class I)** – Paved trails that are separated from roadways. These trails are sometimes shared with pedestrians.
- **Bike lanes (Class II)** – Lanes on roadways designated for use by bicycles through striping, pavement legends, and signs.
- **Bike routes (Class III)** – Roadways designated for bicycle use by signs only; may or may not include additional pavement width for cyclists.
- **Separated Bikeway (Class IV)** – Separated bikeways, also referred to as cycle tracks or protected bikeways, are bikeways for the exclusive use of bicycles which are physically separated from vehicle traffic. Types of separation may include, but are not limited to, grade separation, flexible posts, physical barriers, or on-street parking.

In the immediate project vicinity, there are no bicycle facilities provided on Monte Vista Avenue, Waring Road, or Lester Road.

2.3 EXISTING TRAFFIC COUNTS

Weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak period intersection turning movement counts were collected in September 2021, while local schools were in session, at the following two study intersections:

1) Monte Vista Avenue/Waring Road; and
2) Main Street/Lester Road

A 48-hour traffic volume count was collected in September 2021 on Monte Vista Avenue between Waring Road and Lester Road. In addition to vehicle counts, pedestrian and bicycle counts were also collected at the study intersections. The COVID-19 pandemic has impacted travel and, in some cases, resulted in lower traffic volumes on roadways compared to pre-pandemic conditions. To determine what adjustments, if any, should be made to the traffic counts, a comparison was made to historical 24-hour traffic counts provided by Stanislaus County at the following locations:

- 2017: Monte Vista Avenue east of Waring Road
- 2017: Monte Vista Avenue west of Waring Road
- 2016: Main Street east of Lester Road

The new counts were compared to the historical counts to identify potential adjustment factors. **Appendix C** provides a comparison of the data. Based on the comparison, only one small adjustment was made (westbound approach to the Main Street/Lester Road intersection in the PM) because the new 2021 traffic counts are substantially higher than the pre-pandemic counts. To avoid underestimating the potential project impacts, the resulting existing conditions volumes are equal to or greater than any of the historical counts provided by Stanislaus County. **Figure 2-1** presents the Existing Conditions AM and PM peak hour traffic volumes and lane configurations at the study intersections.

2.4 EXISTING INTERSECTION LEVELS OF SERVICE

Existing intersection lane configurations, signal timings, and peak hour turning movement volumes were used to calculate the levels of service for the study intersections during each peak hour using the Synchro/SimTraffic 11.0 software program, as presented in **Table 2-1.** Observed peak hour factors[1] were used at all intersections for the existing analysis. Pedestrian and bicycle activity were also factored into the analysis. Detailed intersection LOS calculation worksheets are presented in **Appendix D**.

The analysis results presented below are consistent with field observations. At the Monte Vista Avenue/Waring Road intersection the vehicles on the side-street stop-controlled approaches and the major street left-turns appeared to have sufficient gaps in the major street through traffic stream to perform their maneuver with minimal delay. The side-street approaches operate at LOS A during the AM and PM peak hour.

At the Main Street/Lester Avenue intersection the traffic operations were observed to be worse in the AM peak hour than the PM peak hour. The intersection operates at LOS C and LOS B during the AM peak hour and PM peak hour, respectively. Even though the AM peak hour is from 7:15 AM to 8:15 AM at this location, the peak congestion was mostly limited to the peak 15 minutes between 7:45 and 8:00 AM. This is primarily attributed to the bell schedules at both Denair High School and Denair Middle School that start first period at 8 AM. The AM peak hour factor at the Main Street/Lester Avenue intersection is low

[1] The peak hour factor is the relationship between the peak 15-minute flow rate and the full hourly volume: PHF = Hourly volume / (4 x (volume during the peak 15 minutes of flow)). The analysis is based on peak rates of flow occurring within the peak hour because substantial short-term fluctuations may occur during a peak hour.

at 0.72 which indicates a short spike in traffic congestion for 15 minutes compared to traffic congestion in the remaining 45 minutes of the peak hour.

At the Monte Vista Avenue/Lester Road intersection, the traffic operations were regularly impacted by the vehicle queue spillback from the northbound approach to the Main Street/Lester Road intersection during the AM peak hour. The vehicle queue spillback results in the westbound approach to the Monte Vista Avenue/Lester Road intersection operating at LOS F during the AM peak hour. During the PM peak hour, the northbound queue at the Main Street/Lester Road intersection had minimal impact on the traffic operations at the Monte Vista/Lester Road intersection. The westbound approach to the Monte Vista Avenue/Lester Road intersection operates at LOS A during the PM peak hour. There is "Keep Clear" striping in the middle of the intersection to keep vehicles from queuing in the middle of the intersection that is obeyed by most drivers. At the Monte Vista Avenue/Lester Road intersection the northbound traffic is not required to stop; however, when long northbound queues developed at the Main Street/Lester Road intersection the Monte Vista Avenue/Lester Road intersection operates similar to all-way stop control where northbound traffic would allow side-street traffic to enter the intersection in a one-to-one ratio (i.e., one northbound traveling vehicle for every one side-street vehicle).

Table 2-1: Existing Conditions Peak Hour Intersection LOS Summary

Intersection	Control[1]	Peak Hour	Delay[2]	LOS
1. Monte Vista Avenue / Waring Road	SSSC	AM PM	5 (NB) 5 (NB)	A A
2. Main Street / Lester Road[3]	Signal	AM PM	23 17	C B
3. Monte Vista Avenue / Lester Road	SSSC	AM PM	**55 (WB)** 8 (WB)	**F** A

Notes:
Bold denotes locations that operate at an unacceptable service level.
1. SSSC = side-street stop-control; Signal = signalized intersection
2. For side-street stop-controlled intersections the worst approach/movement delay is reported. For signalized intersections the overall weighted average delay is reported.
3. The traffic analysis assumes a short right-turn lane on the northbound and westbound approaches even though a right-turn lane is not striped. Based on field observations, right-turning vehicles were consistently observed bypassing through vehicles waiting in queue due to the width of the pavement provided.
Source: BTC, 2021

Map Key

1 Study Intersection

Volumes Key

XX (YY) AM (PM) Peak Hour Traffic Volumes

Traffic Control Key

STOP Stop Sign

Traffic Signal

BTC

Figure 2-1

Existing Traffic Volumes and Lane Configurations

Ninety-fifth percentile vehicle queues were calculated for each of the study intersections and the results are presented in **Table 2-2**. Detailed queuing reports are provided in **Appendix D**. With the exception of northbound approach to the Main Street/Lester Road intersection and northbound approach to the Monte Vista Avenue/Lester Road intersection, the existing 95^{th} percentile queues are currently accommodated within the available storage.

Table 2-2: Existing 95^{th} Percentile Queueing Analysis

Intersection	Movement[1]	Available Storage (ft)	AM Peak Hour 95^{th} Percentile Queue (ft)	PM Peak Hour 95^{th} Percentile Queue (ft)
1. Monte Vista Avenue / Waring Road	NB - LTR	>1,000	23	26
	SB - LTR	185	30	29
	EB – L	100	11	10
	EB – TR	>1,000	0	0
	WB – L	100	0	9
	WB – T	>1,000	0	0
	WB - R	550	0	0
2. Main Street / Lester Road	NB - LTR	75	**>75**	**>75**
	SB - LTR	>1,000	135	74
	EB – L	125	52	28
	EB – TR	>1,000	96	122
	WB – L	100	80	37
	WB – TR	>1,000	203	110
3. Monte Vista Avenue / Lester Road	NB – TR	175	**215**	73
	SB – LT	75	0	0
	EB – TR	350	64	74
	WB - LR	350	271	77

Notes:
Bold denotes locations that exceed available storage.
1. NB-northbound, SB-southbound, EB-eastbound, WB-westbound, L-left turn, T-through, R-right turn
Source: BTC, 2021

2.4.1 DAILY ROADWAY SEGMENT OPERATION

The existing average daily traffic volume and LOS on Monte Vista Avenue between Waring Road and Lester Road is presented in **Table 2-3**. The roadway operates at LOS B under existing conditions.

Table 2-3: Monte Vista Avenue ADT and LOS Under Existing Conditions

Segment	Daily Traffic[1]	LOS
1. Monte Vista Avenue between Waring Road and Lester Road	8,000	B

Notes:
1. Average daily two-way traffic.
Source: BTC, 2021.

2.5 COLLISION DATA

Table 2-4 summarizes the collision rates at the three existing intersections for the three-year period between January 2017 and December 2019 based on the Statewide Integrated Traffic Records System (SWITRS) database. The State average is the basic average crash rate for a similar intersection presented in the *2018 Crash Data on California State Highways.* One of the study intersections (Monte Vista Avenue/Lester Road) has a collision rate that is higher than the statewide average for a similar facility.

Table 2-4: Collision History at Existing Intersections (January 2017 to December 2019)

Intersection	Number of Collisions	Collision Rate (collisions/million entering vehicles)	
	Total	Actual	State Average
		Total	Total
1. Monte Vista Avenue / Waring Road	2	0.12	0.25
2. Main Street / Lester Road	5	0.36	0.54
3. Monte Vista Avenue / Lester Road	5	0.60	0.25

Source: Statewide Integrated Traffic Records System (SWITRS); BTC, 2021.

3.0 PROJECT CHARACTERISTICS

This chapter provides an overview of the proposed project components and addresses the proposed project trip generation, distribution, and assignment characteristics, allowing for an evaluation of project impacts on the surrounding roadway network. The amount of traffic associated with the project was estimated using a three-step process:

1. **Trip Generation** – The *amount* of vehicle traffic entering/exiting the project site was estimated.
2. **Trip Distribution** – The *direction* trips would use to approach and depart the site was projected.
3. **Trip Assignment** – Trips were then *assigned* to specific roadway segments and intersection turning movements.

3.1 PROJECT DESCRIPTION

The project, located in the Stanislaus County community of Denair, proposes to construct 69 single-family residential units on an 18.61-acre parcel that is currently occupied by two residential units and accessory buildings (i.e., barn and garage). The parcel is located on the north side of Monte Vista Avenue between Waring Road and Lester Road. The project site is bound by a mobile home park (Country Squire Estates)/single-family residential (Hideaway Terrance) to the west, Denair High School to the east, undeveloped land to the north, and Monte Vista Avenue to the south. Vehicular access would be provided by a single access point on Monte Vista Avenue. The project would widen Monte Vista Avenue along the project's frontage to match the existing roadway width provided near the Waring Road intersection. The roadway widening would allow for an exclusive eastbound left-turn lane to be provided into the project site.

3.2 PROJECT TRIP GENERATION

Trip generation refers to the process of estimating the amount of vehicular traffic a project would add to the surrounding roadway system. Estimates are created for the daily condition and for the peak one-hour period during the morning and evening commute when traffic volumes on the adjacent streets are typically the highest. Project trip generation was estimated using rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition), with the resulting estimates presented in **Table 3-1**. The project trip generation takes into consideration the existing trip generation from the two single-family homes on the project site. The project is expected to generate approximately 632 new daily vehicle trips, including approximately 50 morning peak hour and 66 evening peak hour trips.

Table 3-1: Vehicle Trip Generation Estimates

Use	Size	Weekday						
		Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
New Single Family Homes[1]	69 dwelling units	651	13	38	51	43	25	68
Existing Single Family Homes[1]	2 dwelling units	-19	0	-1	-1	-1	-1	-2
Total New Project Trips		***632***	***13***	***37***	***50***	***42***	***24***	***66***

1. ITE land use category 210 – Single-Family Homes (Adj Streets, 7-9A, 4-6P):
   Daily: (T) = 9.44 (X)
   AM Peak Hour: T = 0.74(X); Enter = 25%; Exit = 75%
   PM Peak Hour: T = 0.99 (X); Enter = 63%; Exit = 37%

Source: *Trip Generation Manual* (10th Edition); BTC, 2021

3.3 PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

Project trip distribution refers to the directions of approach and departure that vehicles would take to access and leave the site. Estimates of project trip distribution were developed based on engineering judgement using existing traffic count data and land use patterns. The trip distribution percentages and traffic assignment are shown on **Figure 3-1**.

Map Key

1 Study Intersection

Volumes Key

XX (YY) AM (PM) Peak Hour Traffic Volumes

BTC

Figure 3-1

Project Trip Distribution and Assignment

4.0 EXISTING PLUS PROJECT CONDITIONS

This chapter evaluates potential off-site traffic impacts under Existing Plus Project conditions.

4.1 EXISTING PLUS PROJECT TRAFFIC VOLUMES

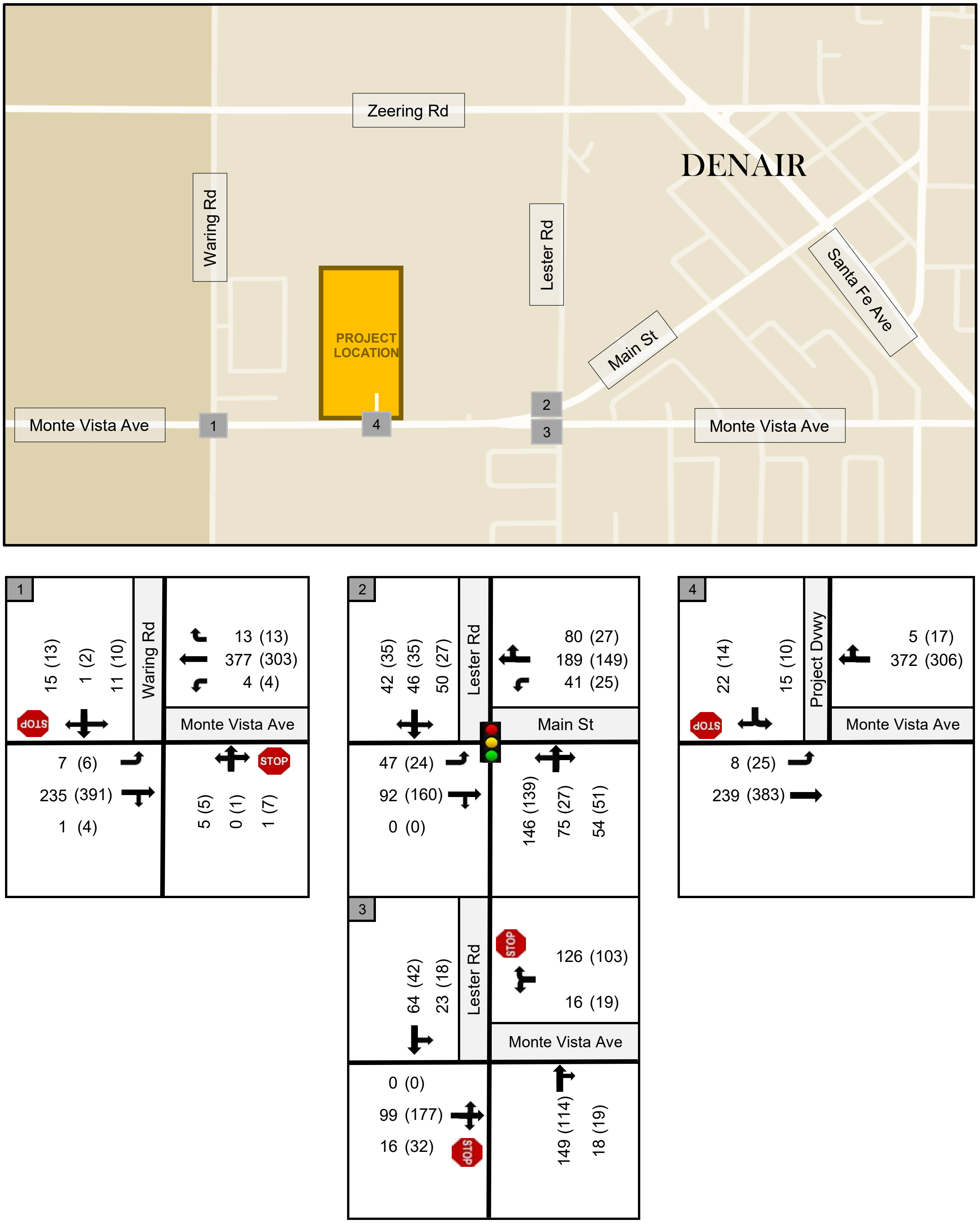
The project traffic volumes on **Figure 3-1** were added to the existing traffic volumes from **Figure 2-1** to estimate the Existing Plus Project traffic volumes, as shown on **Figure 4-1**. The greatest number of projects trips (39) would be added to the Monte Vista Avenue/Waring Road intersection during the PM peak hour, while the least number of project trips (5) would be added to the Monte Vista Avenue/Lester Road intersection during the AM peak hour.

4.2 EXISTING PLUS PROJECT CONDITIONS

4.2.1 INTERSECTION OPERATIONS

Existing Plus Project intersection operations were evaluated using the same methods described in Chapter 1. The Existing and Existing Plus Project analysis results are presented in **Table 4-1**, based on the traffic volumes and intersection configurations presented on **Figure 4-1**. Detailed intersection LOS calculation worksheets are presented in **Appendix E**. The project is not expected to add a substantial number of trips to the roadway network and as a result the intersection operations would remain relatively unchanged compared to Existing conditions. The westbound approach to the Monte Vista Avenue/Lester Road intersection is anticipated to continue to operate at LOS F conditions under Existing Plus Project conditions in the AM peak hour. The project is anticipated to add 1 vehicle trip to the westbound approach of the Monte Vista Avenue/Lester Road intersection in the AM peak hour. The project driveway is anticipated to operate at acceptable LOS A during the AM and PM peak hour.

Ninety-fifth percentile vehicle queues were calculated for each of the study intersections under Existing Plus Project conditions and the results are presented in **Table 4-2**. Detailed queuing reports are provided in **Appendix E**. As shown in Table 4-2, the 95th percentile queues under Existing Plus Project conditions remain relatively unchanged compared to Existing conditions.



Map Key

1 Study Intersection

Volumes Key

XX (YY) AM (PM) Peak Hour Traffic Volumes

Traffic Control Key

STOP Stop Sign

Traffic Signal

BTC

Figure 4-1

Existing Plus Project Traffic Volumes

Table 4-1: Existing Plus Project Conditions Peak Hour Intersection LOS Summary

Intersection	Control[1]	Peak Hour	Existing		Existing Plus Project	
			Delay[2]	LOS	Delay[2]	LOS
1. Monte Vista Avenue / Waring Road	SSSC	AM PM	5 (NB) 5 (NB)	A A	5 (NB) 6 (NB)	A A
2. Main Street / Lester Road[3]	Signal	AM PM	23 17	C B	24 17	C B
3. Monte Vista Avenue / Lester Road	SSSC	AM PM	**55 (WB)** 8 (WB)	**F** A	**55 (WB)** 8 (WB)	**F** A
4. Monte Vista Avenue / Project Driveway	SSSC	AM PM	n/a	n/a	6 (SB) 5 (SB)	A A

Notes:
Bold denotes locations that operate at an unacceptable service level.
1. SSSC = side-street stop-control; Signal = signalized intersection
2. For side-street stop-controlled intersections the worst approach/movement delay is reported. For signalized intersection the overall weighted average delay is reported.
3. The traffic analysis assume a short right-turn lane on the northbound and westbound approaches even though a right-turn lane is not striped. Based on field observations, right-turning vehicles were consistently observed bypassing through vehicles waiting in queue due to the width of the pavement provided.

Table 4-2: Existing and Existing Plus Project 95th Percentile Queueing Analysis

			Existing		Existing Plus Project	
Intersection	Movement[1]	Available Storage (ft)	AM Peak Hour 95th Percentile Queue (ft)	PM Peak Hour 95th Percentile Queue (ft)	AM Peak Hour 95th Percentile Queue (ft)	PM Peak Hour 95th Percentile Queue (ft)
1. Monte Vista Avenue / Waring Road	NB - LTR	>1,000	23	26	23	33
	SB - LTR	185	30	29	30	30
	EB – L	160	11	10	13	11
	EB – TR	>1,000	0	0	0	0
	WB – L	150	0	9	6	9
	WB – T	>1,000	0	0	0	0
	WB - R	550	0	0	0	0
2. Main Street / Lester Road	NB - LTR	75	**>75**	**>75**	**>75**	**>75**
	SB - LTR	>1,000	135	74	135	82
	EB – L	125	52	28	56	35
	EB – TR	>1,000	96	122	107	134
	WB – L	100	80	37	80	37
	WB – TR	>1,000	203	110	221	112
3. Monte Vista Avenue / Lester Road	NB – TR	175	**215**	73	**215**	77
	SB – LT	75	0	0	0	0
	EB – TR	350	64	74	64	74
	WB - LR	350	271	77	271	77
4. Monte Vista Avenue / Project Driveway	SB - LTR	150	n/a	n/a	53	44
	EB – L	100			13	29
	EB – T	>1,000			0	0
	WB - TR	>1,000			0	0

Notes:
Bold denotes locations that exceed available storage.
1. NB-northbound, SB-southbound, EB-eastbound, WB-westbound, L-left turn, T-through, R-right turn
Source: BTC, 2021

4.2.2 DAILY ROADWAY SEGMENT OPERATION

The Existing Plus Project average daily traffic volume and LOS on Monte Vista Avenue between Waring Road and Project Driveway and Project Driveway and Lester Road is presented in **Table 4-3**. The roadway continues to operate at LOS B under Existing Plus Project conditions.

Table 4-3: Monte Vista Avenue ADT and LOS Under Existing Plus Project Conditions

Segment	Existing		Existing Plus Project	
	Daily Traffic[1]	LOS	Daily Traffic[1]	LOS
1. Monte Vista Avenue between Waring Road and Project Driveway	8,000	B	8,400	B
2. Monte Vista Avenue between Project Driveway and Lester Road	8,000	B	8,300	B

Notes:
1. Average daily two-way traffic.
Source: BTC, 2021.

5.0 CUMULATIVE CONDITIONS

This chapter evaluates potential off-site traffic impacts under Cumulative No Project and Cumulative Plus Project conditions. Cumulative conditions reflect year 2035 which is the Stanislaus County General Plan horizon year. Under Cumulative No Project conditions it was assumed that Monte Vista Avenue east of Waring Road and along the project frontage would be widened to a 110' cross section that could accommodate two through lanes in each direction and a median turn lane. The intersections of Lester Road with Main Street and Monte Vista Avenue were assumed to remain at their existing configuration.

5.1 CUMULATIVE NO PROJECT AND PLUS PROJECT TRAFFIC VOLUMES

The Three-County Travel Demand Model (Three-County TDM) was used to develop an annual growth factor in the project area to estimate AM and PM peak hour traffic volumes for Cumulative No Project conditions. Based on the Three-County TDM, the annual growth rate in the AM peak hour and PM peak hour is 1.0% per year. Cumulative Plus Project traffic volumes were developed by adding the project trips to the Cumulative No Project traffic volumes. The Cumulative No Project and Cumulative Plus Project traffic volumes are presented on **Figure 5-1** and **Figure 5-2**, respectively.

5.2 CUMULATIVE NO PROJECT AND PLUS PROJECT CONDITIONS

5.2.1 INTERSECTION OPERATIONS

Cumulative No Project and Cumulative Plus Project intersection operations were evaluated using the same methods described in Chapter 1. The Cumulative No Project and Cumulative Plus Project analysis results are presented in **Table 5-1**. Detailed intersection LOS calculation worksheets are presented in **Appendix F**.

The project is not expected to add a substantial number of trips to the roadway network and as a result the intersection operations under Cumulative Plus Project conditions would remain relatively unchanged compared to Cumulative No Project conditions. The westbound approach to the Monte Vista Avenue/Lester Road intersection is anticipated to continue to operate at LOS F conditions under Cumulative No Project and Cumulative Plus Project conditions in the AM peak hour. The project is anticipated to add 1 vehicle trip on the westbound approach in the AM peak hour. The project driveway is anticipated to operate at acceptable LOS A during the AM and PM peak hour.

Table 5-1: Cumulative No Project and Plus Project Conditions Peak Hour Intersection LOS Summary

Intersection	Control[1]	Peak Hour	Cumulative No Project		Cumulative Plus Project	
			Delay[2]	LOS	Delay[2]	LOS
1. Monte Vista Avenue / Waring Road	SSSC	AM PM	5 (SB) 6 (SB)	A A	5 (SB) 6 (SB)	A A
2. Main Street / Lester Road[3]	Signal	AM PM	25 18	C B	26 18	C B
3. Monte Vista Avenue / Lester Road	SSSC	AM PM	**>100 (WB)** 10 (WB)	**F** A	**>100 (WB)** 11 (WB)	**F** B
4. Monte Vista Avenue / Project Driveway	SSSC	AM PM	n/a	n/a	6 (SB) 5 (SB)	A A

Notes:
1. SSSC = side-street stop-control; Signal = signalized intersection
2. For side-street stop-controlled intersections the worst approach/movement delay is reported. For signalized intersection the overall weighted average delay is reported.
Source: BTC, 2021

Map Key

1 Study Intersection

Volumes Key

XX (YY) AM (PM) Peak Hour Traffic Volumes

Traffic Control Key

STOP Stop Sign

Traffic Signal

BTC

Figure 5-1

Cumulative No Project Traffic Volumes and Lane Configurations

BTC

Figure 5-2

Cumulative Plus Project Traffic Volumes

Ninety-fifth percentile vehicle queues were calculated for each of the study intersections under Cumulative No Project and Cumulative Plus Project conditions and the results are presented in **Table 5-2**. Detailed queuing reports are provided in **Appendix F**. As shown in Table 5-2, the 95th percentile queues under Cumulative Plus Project conditions remain relatively unchanged compared to Cumulative No Project conditions.

Table 5-2: Cumulative No Project and Plus Project 95th Percentile Queueing Analysis

			Cumulative No Project		Cumulative Plus Project	
Intersection	Movement[1]	Available Storage (ft)	AM Peak Hour 95th Percentile Queue (ft)	PM Peak Hour 95th Percentile Queue (ft)	AM Peak Hour 95th Percentile Queue (ft)	PM Peak Hour 95th Percentile Queue (ft)
1. Monte Vista Avenue / Waring Road	NB - LTR	>1,000	27	32	28	36
	SB - LTR	185	43	43	44	45
	EB – L	160	16	11	16	11
	EB – TR	>1,000	0	0	0	0
	WB – L	150	3	8	8	12
	WB – TR	>1,000	0	0	0	0
2. Main Street / Lester Road	NB - LTR	75	**>75**	**>75**	**>75**	**>75**
	SB - LTR	>1,000	151	93	153	93
	EB – L	125	57	34	66	39
	EB – TR	>1,000	109	136	120	136
	WB – L	100	95	38	95	40
	WB – TR	>1,000	268	124	268	127
3. Monte Vista Avenue / Lester Road	NB – TR	175	**493**	87	**493**	93
	SB – LT	75	0	0	0	0
	EB – TR	350	66	84	66	84
	WB - LR	350	**512**	91	**512**	98
4. Monte Vista Avenue / Project Driveway	SB - LTR	150	n/a	n/a	50	44
	EB – L	100			14	36
	EB – T	>1,000			0	0
	WB - TR	>1,000			0	0

Notes:
1. NB-northbound, SB-southbound, EB-eastbound, WB-westbound, L-left turn, T-through, R-right turn
Source: BTC, 2021

5.2.2 DAILY ROADWAY SEGMENT OPERATION

Cumulative No Project and Cumulative Plus Project average daily traffic volume and LOS on Monte Vista Avenue between Waring Road and Project Driveway and Project Driveway and Lester Road are presented in **Table 5-3**. The roadway would operate at LOS A as a four-lane roadway (two lanes in each direction) under Cumulative No Project and Cumulative Plus Project conditions.

Table 5-3: Monte Vista Avenue ADT and LOS Under Cumulative No Project and Plus Project Conditions

Segment	Cumulative No Project		Cumulative Plus Project	
	Daily Traffic[1]	LOS	Daily Traffic[1]	LOS
1. Monte Vista Avenue between Waring Road and Project Driveway	9,200	A	9,600	A
2. Monte Vista Avenue between Project Driveway and Lester Road	9,200	A	9,500	A

Notes:
1. Average daily two-way traffic.
Source: BTC, 2021.

6.0 VEHICLE MILES OF TRAVEL EVALUATION

To be provided in next draft.

7.0 SITE PLAN REVIEW

This chapter analyzes site access and internal circulation for vehicles, pedestrians, bicycles, and emergency vehicles based on the tentative subdivision map presented previously on Appendix A**.** The proposed off-street parking was also reviewed.

7.1 VEHICULAR SITE ACCESS AND CIRCULATION

Access to the project site would be provided by a new roadway connection (Project Driveway) to Monte Vista Avenue. Based on the Stanislaus County General Plan the ultimate configuration of Monte Vista Avenue adjacent to the project site is a four-lane roadway with 110-foot right-of-way. The project proposes to widen Monte Vista Avenue on the north side to provide its equal share of right-of-way (55 feet as measured from the roadway center line). Monte Vista Avenue is a minor arterial; thus, it is recommended that a STOP (R1-1) sign be placed at the Project Driveway so that project traffic leaving the site would be required to stop and yield to through traffic on Monte Vista Avenue. According to the *Standards and Specifications 2014 Edition* (County Standards) prepared by the Stanislaus County Department of Public Works, a left-turn lane and taper may be required if the left-turn ingress volume (50 minimum) and the opposing volume per lane exceed 750 in any peak hour. The project traffic volumes do not meet these requirements. Nonetheless, the project will be providing a 100' left-turn lane with a 90' taper to provide some deceleration prior to the turn, as well as storage for vehicles that are stopped and waiting for the opportunity to complete the turn. This left-turn lane design would mirror what is provided at the Waring Road/Monte Vista Avenue intersection. As shown in previous chapters, the Project Driveway would operate at acceptable LOS A under Existing Plus Project and Cumulative Plus Project conditions.

> ***Recommendation:*** Provide a STOP (R1-1) sign at the Project Driveway so that project traffic leaving the site would be required to stop and yield to through traffic on Monte Vista Avenue.

The internal roadways would provide a 50-foot right-of-way with 32 feet of paved area that is sufficient for two travel lanes (one lane in each direction) and on-street parking on both sides of the roadway. The 50-foot right-of-way and two travel lanes is consistent with the engineering standards presented in the County Standards.

There are two internal "T" intersections that intersect at 90 degrees and provide adequate sight distance. According to the *California Manual on Uniform Traffic Control Devices* (CA MUTCD) the use of YIELD or STOP signs at an intersection should be used if on one or more of the following conditions exist:

- An intersection of a less important road with a main road where application of the normal right-of-way rule would not be expected to provide reasonable compliance with the law;
- A street entering a designated through highway or street; and/or
- An unsignalized intersection in a signalized area.

Based on the layout of the intersections it does not appear that any of these conditions exist. Therefore, it is recommended that neither YIELD nor STOP signs be provided at these intersections. Based on a review of the tentative subdivision map the project would provide adequate vehicle site access and circulation assuming the recommendation listed above is provided.

7.2 PEDESTRIAN ACCESS AND CIRCULATION

All of the internal roadways are proposed to have the same design and include a five-foot wide sidewalk on both sides of the roadway which is consistent with the County Standard. Along the project's frontage, 10-foot sidewalk would be provided to match the existing sidewalk width to the west. The project would also extend an off-site sidewalk (five-foot wide) from the project's southeast corner to the driveway near the southwest corner of the Denair High School Football Stadium. This would provide a complete sidewalk facility from the project to the Denair School District facilities. The project's proposed sidewalk improvements would eliminate the existing gap in the sidewalk system on the north side of Monte Vista Avenue between Waring Road and Lester Road. The project would provide adequate pedestrian access and circulation.

7.3 BICYCLE ACCESS AND CIRCULATION

The project does not propose to provide any dedicated bicycle facilities. Within the project site, dedicated bicycle facilities are not warranted given the low daily vehicle traffic volumes (less than 700 vehicles per day) and ample pavement width for vehicles and bicyclists to share the road. Along Monte Vista Avenue, there are no County plans to provide dedicated bicycle facilities. However, the project is widening Monte Vista Avenue on the north side that could accommodate a future Class II bicycle lane, if desired, in the future.

7.4 EMERGENCY VEHICLE ACCESS

Several factors determine whether a project has adequate access for emergency vehicles, including:

1. Number of access points (both public and emergency access only)
2. Width of internal roadways
3. Turnarounds at dead-end streets

Based on the County's Fire Code (adopted from the *2019 California Fire Code*), the minimum number of access roads serving a residential development shall be based upon the number of dwelling units served as follows:

- Development of one or two-family dwellings where the number of dwelling units exceed 30 shall be provided with two separate and approved fire apparatus access roads; where there are more than 30-dwelling units on a single public or private fire apparatus access road and all dwelling units are equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3 of the *California Fire Code*, access from two directions shall not be required.

The project (69 dwelling units) would only be served by a single access road; however, new single-family homes in California are required to have an automatic sprinkler system. Therefore, the project can have a single access road for emergency vehicles.

Cross-sections for the proposed streets within the project site were reviewed. All street sections provide a minimum of 20-feet of clearway (meaning no obstructions in terms of parked vehicles, landscaping, etc.), such that sufficient width is provided for emergency vehicle access and circulation.

There is one internal roadway (Street B) that dead-ends with no turnaround (i.e., no hammerhead or cul-de-sac) on the northern edge of the project site. A turnaround is not required based on the County's Fire Code because the dead-end street is below 150 feet in length.

7.5 PARKING

Two enclosed parking spaces for each residential unit would be provided. This is consistent with Stanislaus County Zoning Ordinance that requires two off-street parking spaces per single-family dwelling unit.

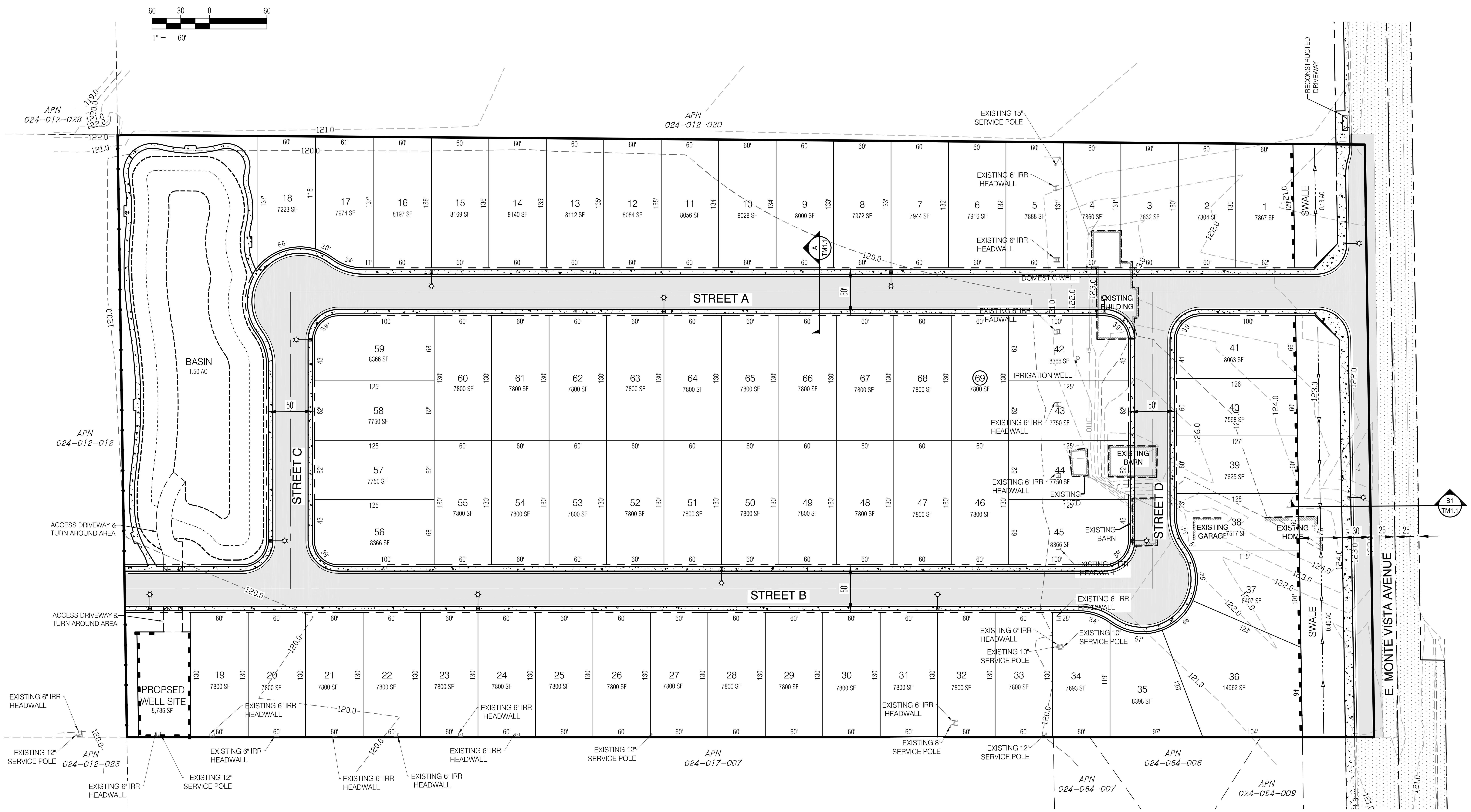
APPENDIX A

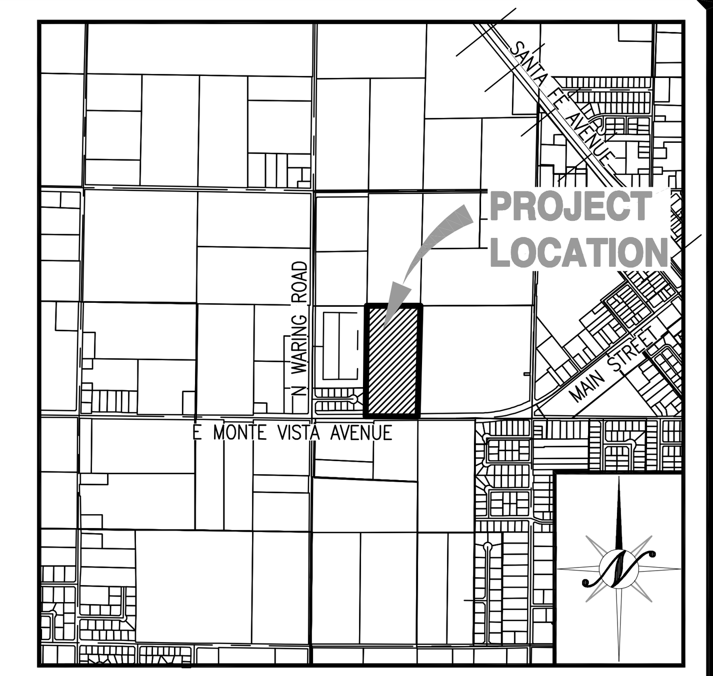
TENTATIVE SUBDIVISION MAP

MONTE VISTA COLLECTION SUBDIVISION

TENTATIVE SUBDIVISION MAP

STANISLAUS COUNTY, CALIFORNIA





VICINITY MAP

SHEET INDEX

PROJECT INFORMATION

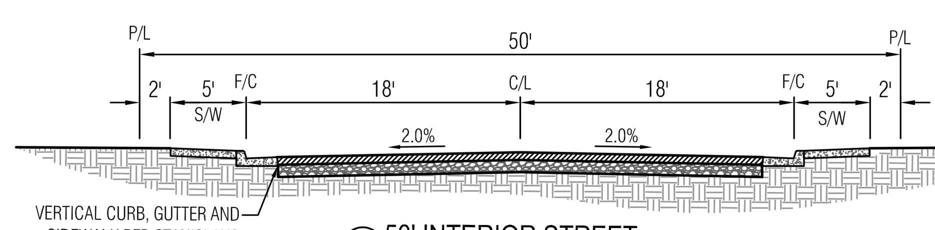
A. REGULATORY AGENCY:	STANISLAUS COUNTY 1010 10TH STREET, SUITE 3400 MODESTO, CA 95354 T: (209) 525-6557 CONTACT: JEREMY BALLARD
B. APPLICANT:	LAZARES COMPANIES 16795 LARK AVENUE, SUITE 106 LOS GATOS, CA. 95032 T: (209) 662-5098 CONTACT: TREVOR SMITH
C. ENGINEER:	NORTHSTAR ENGINEERING GROUP, INC 620 12th STREET MODESTO CA, 95354 T: (209) 524-3525 CONTACT: PAMELA HURBAN
D. ASSESSOR'S PARCEL NUMBER:	024-012-09
E. EXISTING LAND USE:	AGRICULTURE
F. PROPOSED LAND USE:	SINGLE FAMILY HOMES
G. EXISTING ZONING/GP:	LOW-DENSITY RESIDENTIAL (COUNTY GP) RESIDENTIAL-ESTATE (DENAIR CP)/ R-A
H. PROPOSED ZONING/GP:	PLANNED DEVELOPMENT/ R-1
I. TOTAL PROJECT SIZE:	18.6± ACRES
J. NET ACREAGE:	15.9± ACRES
K. TOTAL NUMBER OF R-1 LOTS:	69
L. NET DENSITY:	4.4 DU/AC
M. TYPICAL LOT SIZE:	60 X 130'
N. MAXIMUM FOOTPRINT COVERAGE:	40%
O. PARKING:	MINIMUM TWO CAR GARAGE, AND TWO DRIVEWAY SPACES PER LOT
P. CONTOURS:	1.0-FOOT INTERVALS
Q. UTILITIES:	WATER SYSTEM - DENAIR COMMUNITY SERVICE DISTRICT SANITARY SEWER - DENAIR COMMUNITY SERVICE DISTRICT STORM DRAINAGE - PRIVATE RETENTION SYSTEM GAS - PG&E ELECTRIC - TID TELEPHONE - AT&T SCHOOL DISTRICT - DENAIR UNIFIED SCHOOL DISTRICT

GENERAL NOTES

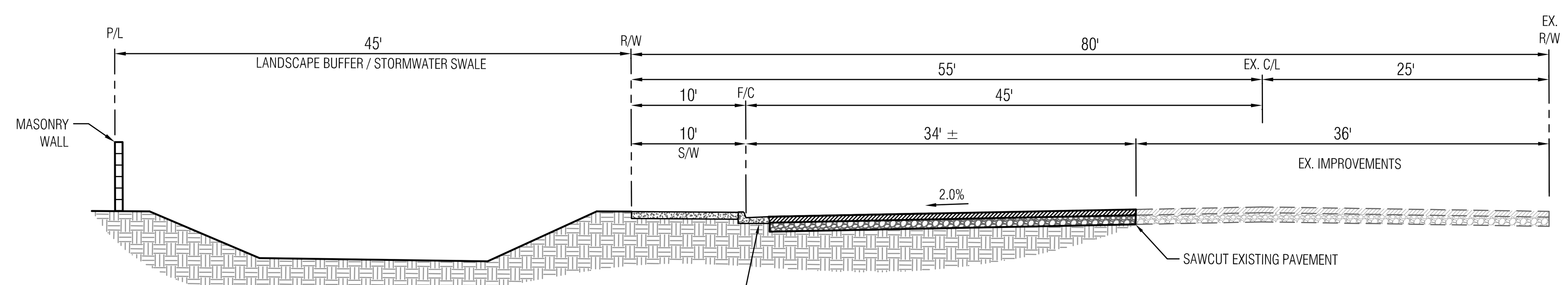
1. ALL IMPROVEMENTS SHALL BE CONSTRUCTED AS PER THE STANISLAUS COUNTY STANDARD PLANS AND SPECIFICATIONS EXCEPT AS NOTED.
2. STORM DRAINAGE TO BE CONVEYED TO A ON-SITE STORM DRAIN RETENTION BASIN. ALL IMPROVEMENTS TO BE CONSTRUCTED TO THE STANISLAUS COUNTY STANDARDS.
3. ALL STORM DRAINAGE IMPROVEMENTS AS PART OF FUTURE IMPROVEMENTS PLANS AND STUDIES SHALL CONFORM TO THE REQUIREMENTS SET FORTH IN NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT 2013-0001-DWQ AND THE MULTI-AGENCY POST-CONSTRUCTION STORMWATER STANDARDS MANUAL APPROVED OR ADOPTED PRIOR TO THE TIME OF THIS TENTATIVE MAP APPLICATION BEING DEEMED COMPLETE.
4. SANITARY SEWER TO BE CONSTRUCTED TO THE DENAIR COMMUNITY SERVICE DISTRICT STANDARDS AND SPECIFICATIONS.
5. WATER SYSTEM TO BE CONSTRUCTED TO THE DENAIR COMMUNITY SERVICE DISTRICT STANDARDS AND SPECIFICATIONS.
6. STREET LIGHTING SHALL BE INSTALLED PER STANISLAUS COUNTY STANDARD SPECIFICATIONS.
7. PUBLIC UTILITIES ARE TO BE INSTALLED UNDER GROUND IN EASEMENTS.
8. THE SUBDIVIDER HEREBY RESERVES THE RIGHT TO FILE "MULTIPLE SUBDIVISION MAPS" AS SET FORTH BY THE SUBDIVISION MAP ACT, ARTICLE 4, SECTION 66456.1., AND FILE PARCEL MAPS FOR REASON OF SALE. ALL PARCEL LINES SHALL CONFORM TO THIS TENTATIVE MAP.
9. PUBLIC UTILITY EASEMENTS WILL BE PROVIDED ALONG ALL STREET IN-TRACT FRONTAGES.
10. ALL EXISTING STRUCTURES AND TREES ARE TO BE REMOVED UNLESS OTHERWISE NOTED. ALL EXISTING POWER POLES AND OVERHEAD POWERLINES TO BE REMOVED/ UNDERGROUNDED.
11. ALL LOT SETBACK REQUIREMENTS AND LOT SIZES ARE TO BE IN ACCORDANCE WITH THE DENAIR COMMUNITY PLAN.

LEGAL DESCRIPTION

THE LAND DESCRIBED HEREIN IS SITUATED IN THE STATE OF CALIFORNIA, COUNTY OF STANISLAUS UNINCORPORATED AREA AND DESCRIBED AS FOLLOWS: THE EAST ONE-HALF OF LOT 27 OF THE ELMWOOD COLONY, ACCORDING TO THE OFFICIAL MAP THEREOF, FILES IN THE OFFICE OF THE RECORDER OF STANISLAUS COUNTY, CALIFORNIA, ON APRIL 11, 1905 IN VOLUME 2 OF MAPS, AND PAGE 13.



A 50' INTERIOR STREET
NTS



B1 E. MONTE VISTA AVENUE
NTS

CALL BEFORE YOU DIG 800-227-2600

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTIONS	DATE	APPROVED

REVISIONS

TENTATIVE SUBDIVISION MAP AND CROSS SECTIONS

MONTE VISTA COLLECTION SUBDIVISION

STANISLAUS COUNTY, CALIFORNIA

NorthStar Engineering Group, Inc.
CIVIL ENGINEERING • SURVEYING • PLANNING
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

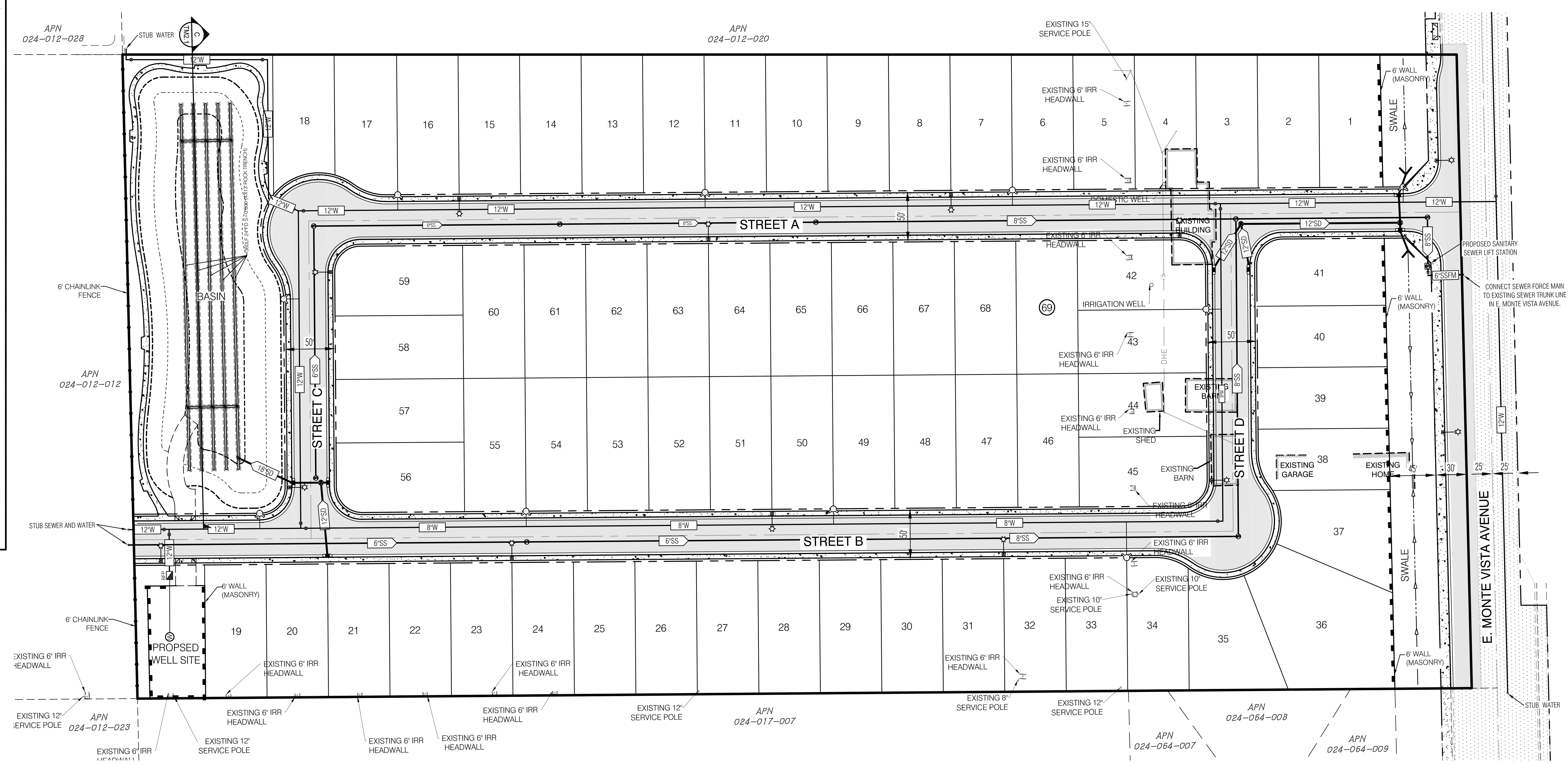
JOB #:	20-2759
DATE:	09/08/2021
SCALE:	AS SHOWN
DRAWN:	DR
DESIGN:	PMH/KM
CHK'D:	TPD

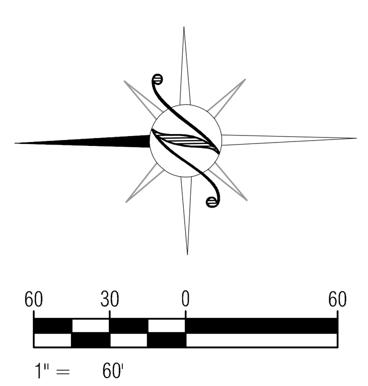
SHEET NUMBER

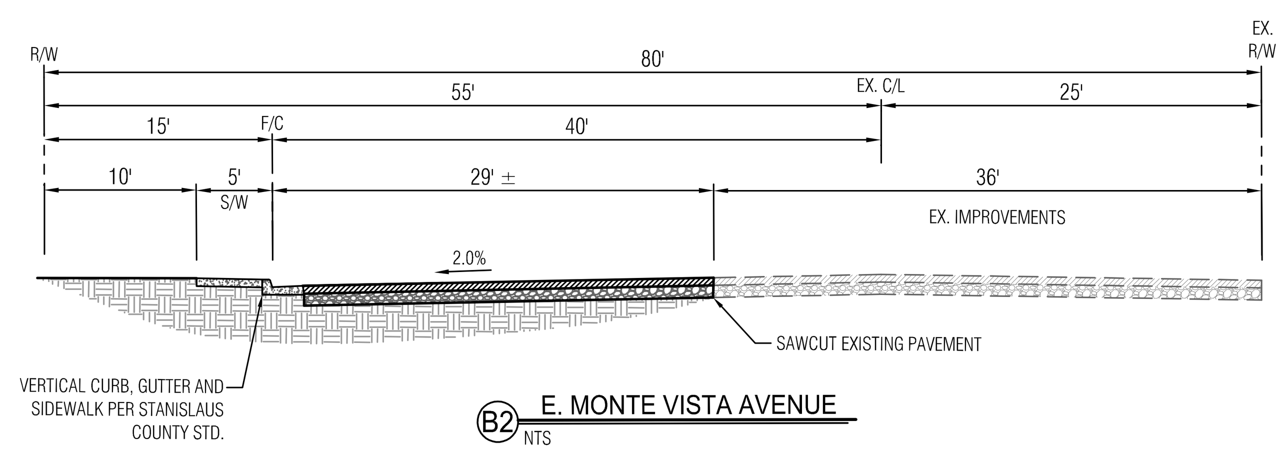
TM1.1

LEGEND

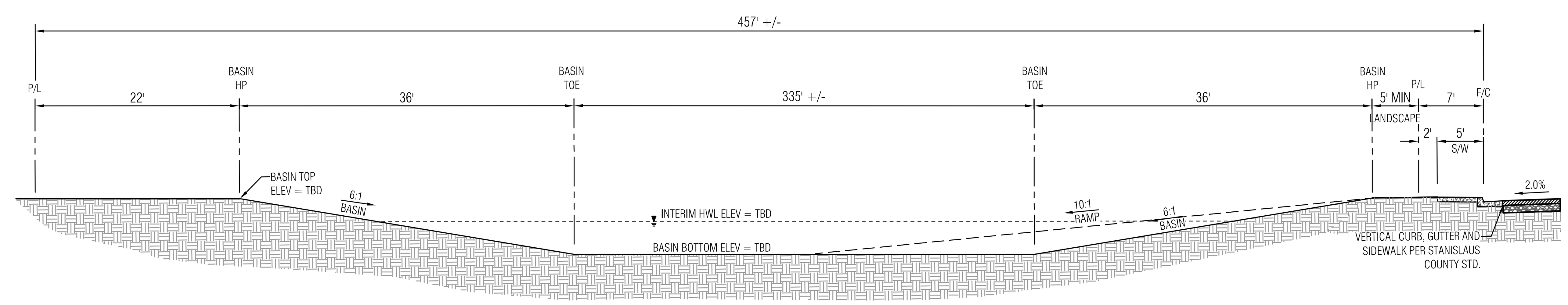
	EXISTING	PROPOSED
BOUNDARY LINE	N/A	
CENTERLINE		
RIGHT-OF-WAY		
PARCEL LINE		
CURB, GUTTER, AND SIDEWALK		
EDGE OF PAVEMENT		
DIRT ROAD		N/A
OVER HEAD ELECTRICAL	OHE	N/A
GAS LINE	G	N/A
CONTOURS	32	32
WALL (SEE LABEL FOR TYPE)		
FENCE (CHAINLINK OR VINYL)		
FENCE (WIRE OR HOGWIRE)		
FENCE (WOOD OR WROUGHT IRON)		
BARRICADE		
TREE OR SHRUB/TO BE REMOVED		N/A
SIGN		
SERVICE POLE		N/A
FLOW LINE		
STORM DRAIN (MAIN)	SD Ex12"SD	12"SD
STORM DRAIN MAINTENANCE HOLE		
CURB INLET		
STORM PUMP STATION	N/A	
STORM DRAIN OUTLET	N/A	
WATER (MAIN)	Ex8"W	8"W
WATER VALVE	WV	WV
FIRE HYDRANT	N/A	
SEWER MAINTENANCE HOLE		
SEWER (MAIN)	SS Ex12"SS	12"SS



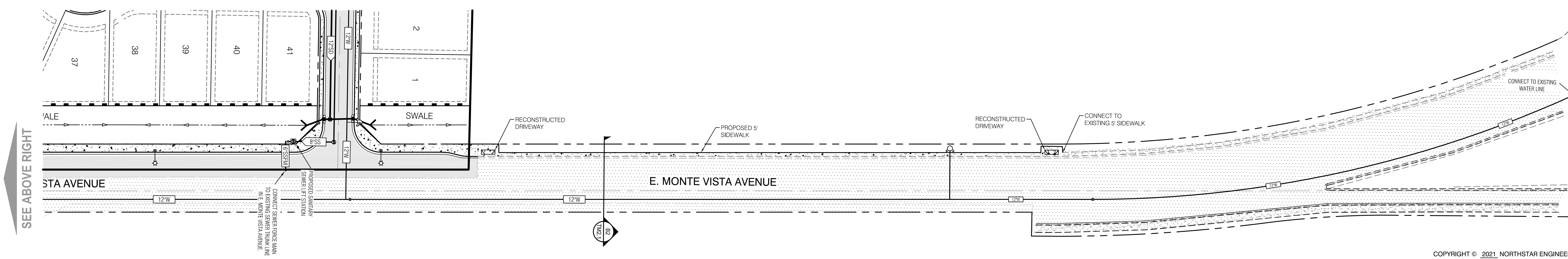




B2 E. MONTE VISTA AVENUE
NTS



C RETENTION BASIN CROSS SECTION
NTS



CALL BEFORE YOU DIG 800-227-2600

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTIONS	DATE	APPROVED

REVISIONS

TENTATIVE SUBDIVISION MAP DETAILS

MONTE VISTA COLLECTION SUBDIVISION

STANISLAUS COUNTY, CALIFORNIA

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

JOB #:	20-2759
DATE:	09/08/2021
SCALE:	AS SHOWN
DRAWN:	DR
DESIGN:	PMH/KM
CHK'D:	TPD

SHEET NUMBER

TM2.1

APPENDIX B

LOS CRITERIA

Signalized Intersections

Traffic conditions at signalized intersections were evaluated using methods developed by the Transportation Research Board (TRB), as documented in the *Highway Capacity Manual 6th Edition* (2016 HCM) for vehicles using the analysis software Synchro 11.0. The HCM method calculates control delay at an intersection based on inputs such as traffic volumes, lane geometry, signal phasing and timing, pedestrian crossing times, and peak hour factors. Control delay is defined as the delay directly associated with the traffic control device (i.e., a traffic signal or stop sign) and specifically includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The relationship between LOS and control delay for signalized intersections is summarized in **Table A.**

Table A: Signalized Intersection LOS Criteria

Level of Service	Description	Delay in Seconds
A	Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	< 10.0
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10.0 to 20.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20.0 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35.0 to 55.0
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	This level is considered unacceptable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.	> 80.0

Source: 2016 *Highway Capacity Manual*

Unsignalized Intersections

For unsignalized (all-way stop controlled and side-street stop controlled) intersections, the HCM 6th Edition method for unsignalized intersections was used. With this method, operations are defined by the average control delay per vehicle (measured in seconds). The control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in queue. **Table B** summarizes the relationship between LOS and delay for unsignalized intersections. At side-street stop-controlled intersections, the delay is calculated for each stop-controlled movement. The highest movement/approach delay are reported for side-street stop-controlled intersections.

Table B: Unsignalized Intersection LOS Criteria

Level of Service	Description	Delay in Seconds
A	Little or no delays	≤ 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic, delays where intersection capacity exceeded	> 50.0

Source: 2016 *Highway Capacity Manual*

Roadway Segments

The roadway segment analysis for Monte Vista Avenue between Waring Road and Lester Road was based on the average daily traffic (ADT) volume, functional classification of the roadway (minor arterial) and the LOS thresholds presented in the Stanislaus County General Plan (Table II-1). **Table C** summarizes the roadway segment LOS criteria.

Table C: Roadway Segment LOS Criteria

Street Classification	LOS Thresholds (vehicles / per day / per lane)				
	A	B	C	D	E
Rural Minor Arterial	3,000	5,000	7,000	8,400	10,000

Source: *Stanislaus County General Plan*

APPENDIX C

TRAFFIC COUNT COMPARISON

Traffic Count Comparison

Location	Direction	Period	YEAR OF DATA 2016	2017	2021	% Difference (2021 vs. Historical Count)	Adjusted 2021 Count
Main Street east of Lester	Eastbound	AM	164		192	17%	192
		PM	228		236	4%	236
	Westbound	AM	289		309	7%	309
		PM	197		189	-4%	***197***
Monte Vista east of Waring	Eastbound	AM		152	239	58%	239
		PM		246	383	56%	383
	Westbound	AM		214	372	74%	372
		PM		246	306	24%	306
	Both	Daily		6818	8006	17%	8006
Monte Vista west of Waring	Eastbound	AM		145	236	63%	236
		PM		285	380	33%	380
	Westbound	AM		211	379	80%	379
		PM		242	309	28%	309
Average AM % Difference						50%	
Average PM % Difference						23%	
Average Daily % Difference						17%	

Adjusted Count: Assume volume is at least equal to a historical traffic count.

APPENDIX D

EXISTING CONDITIONS ANALYSIS WORKSHEETS

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.0	0.1	0.1	0.1
Total Del/Veh (s)	1.6	0.5	5.3	4.4	1.1
Vehicles Entered	232	396	6	28	662
Vehicles Exited	233	396	6	28	663
Hourly Exit Rate	233	396	6	28	663
Input Volume	236	394	5	27	662
% of Volume	99	101	114	105	100

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	1.1	0.0	0.2	0.4
Total Del/Veh (s)	25.4	23.4	19.0	30.0	23.3
Vehicles Entered	127	308	278	136	849
Vehicles Exited	126	309	279	135	849
Hourly Exit Rate	126	309	279	135	849
Input Volume	128	310	274	135	848
% of Volume	98	100	102	100	100

3: Lester Rd & Monte Vista Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.2	0.0	0.1
Total Del/Veh (s)	5.9	54.1	33.2	1.3	27.5
Vehicles Entered	113	143	169	89	514
Vehicles Exited	113	143	169	89	514
Hourly Exit Rate	113	143	169	89	514
Input Volume	112	141	168	88	508
% of Volume	101	101	101	101	101

10: Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.2	2.2	1.4
Vehicles Entered	253	375	628
Vehicles Exited	253	375	628
Hourly Exit Rate	253	375	628
Input Volume	253	372	625
% of Volume	100	101	100

Total Network Performance

Denied Del/Veh (s)	0.5
Total Del/Veh (s)	33.8
Vehicles Entered	1062
Vehicles Exited	1061
Hourly Exit Rate	1061
Input Volume	4277
% of Volume	25

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	WB	NB	SB
Directions Served	L	T	LTR	LTR
Maximum Queue (ft)	23	3	31	36
Average Queue (ft)	1	0	5	13
95th Queue (ft)	11	4	23	30
Link Distance (ft)		1053	706	1119
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	68	127	134	268	148	71	56	168
Average Queue (ft)	20	47	24	98	37	62	27	66
95th Queue (ft)	52	96	80	203	95	79	65	135
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						35	1	
Queuing Penalty (veh)						104	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)		0	0	8	0	53	1	
Queuing Penalty (veh)		0	0	12	0	29	2	

Intersection: 3: Lester Rd & Monte Vista Ave

Movement	EB	WB	NB
Directions Served	LTR	LTR	TR
Maximum Queue (ft)	72	297	258
Average Queue (ft)	40	100	82
95th Queue (ft)	64	271	215
Link Distance (ft)	432	1040	1166
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10:

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 147

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.0	0.1	0.1	0.2
Total Del/Veh (s)	1.8	0.5	5.0	4.9	1.4
Vehicles Entered	379	311	8	26	724
Vehicles Exited	379	312	8	25	724
Hourly Exit Rate	379	312	8	25	724
Input Volume	380	310	9	25	724
% of Volume	100	101	89	100	100

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.8	0.0	0.1	0.3
Total Del/Veh (s)	17.7	15.8	14.5	22.2	16.7
Vehicles Entered	176	198	215	89	678
Vehicles Exited	176	199	216	89	680
Hourly Exit Rate	176	199	216	89	680
Input Volume	176	196	214	87	674
% of Volume	100	101	101	102	101

3: Lester Rd & Monte Vista Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.2	0.0	0.1
Total Del/Veh (s)	5.8	7.4	5.6	1.3	5.6
Vehicles Entered	207	123	132	61	523
Vehicles Exited	208	123	132	61	524
Hourly Exit Rate	208	123	132	61	524
Input Volume	207	118	134	60	519
% of Volume	100	104	99	101	101

10: Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	1.9	1.0
Vehicles Entered	387	307	694
Vehicles Exited	387	307	694
Hourly Exit Rate	387	307	694
Input Volume	388	306	695
% of Volume	100	100	100

Total Network Performance

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	17.3
Vehicles Entered	966
Vehicles Exited	968
Hourly Exit Rate	968
Input Volume	4251
% of Volume	23

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	WB	WB	WB	NB	SB
Directions Served	L	L	T	R	LTR	LTR
Maximum Queue (ft)	20	19	8	1	32	30
Average Queue (ft)	1	1	0	0	6	12
95th Queue (ft)	10	9	6	2	26	29
Link Distance (ft)			1053		706	1119
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100	100		550		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	39	147	60	147	36	69	56	93
Average Queue (ft)	9	64	11	55	13	54	28	35
95th Queue (ft)	28	122	37	110	36	81	64	74
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						13	0	
Queuing Penalty (veh)						27	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)		1		1		34	1	
Queuing Penalty (veh)		0		1		18	2	

Intersection: 3: Lester Rd & Monte Vista Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	TR	LT
Maximum Queue (ft)	86	100	98	1
Average Queue (ft)	50	45	28	0
95th Queue (ft)	74	77	73	2
Link Distance (ft)	432	1040	1166	56
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 10:

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 48

APPENDIX E

EXISTING PLUS PROJECT CONDITIONS ANALYSIS WORKSHEETS

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.0	0.1	0.1	0.1
Total Del/Veh (s)	0.4	0.5	5.0	4.0	0.6
Vehicles Entered	242	408	6	27	683
Vehicles Exited	242	408	6	27	683
Hourly Exit Rate	242	408	6	27	683
Input Volume	243	404	6	27	680
% of Volume	100	101	96	101	100

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	1.1	0.0	0.2	0.4
Total Del/Veh (s)	26.0	25.0	19.4	29.8	24.2
Vehicles Entered	140	312	276	140	868
Vehicles Exited	141	313	277	140	871
Hourly Exit Rate	141	313	277	140	871
Input Volume	139	310	276	138	863
% of Volume	101	101	101	101	101

3: Lester Rd & Monte Vista Ave Performance by approach (Low Project Volume-No Change)

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)					
Total Del/Veh (s)					
Vehicles Entered					
Vehicles Exited					
Hourly Exit Rate					
Input Volume					
% of Volume					

4: Monte Vista Ave & Project Dvwy Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.5	0.6	5.7	1.2
Vehicles Entered	251	393	41	685
Vehicles Exited	251	394	41	686
Hourly Exit Rate	251	394	41	686
Input Volume	253	390	37	680
% of Volume	99	101	110	101

10: Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.2	2.1	1.3
Vehicles Entered	263	382	645
Vehicles Exited	265	382	647
Hourly Exit Rate	265	382	647
Input Volume	263	377	640
% of Volume	101	101	101

Total Network Performance

Denied Del/Veh (s)	0.5
Total Del/Veh (s)	35.5
Vehicles Entered	1114
Vehicles Exited	1118
Hourly Exit Rate	1118
Input Volume	4448
% of Volume	25

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	WB	WB	NB	SB
Directions Served	L	L	T	LTR	LTR
Maximum Queue (ft)	24	9	2	29	32
Average Queue (ft)	2	0	0	5	12
95th Queue (ft)	13	6	3	23	29
Link Distance (ft)			1059	706	1119
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100	100			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	82	136	121	292	159	71	56	168
Average Queue (ft)	23	51	23	105	40	61	26	68
95th Queue (ft)	56	107	73	221	106	80	65	135
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						36	0	
Queuing Penalty (veh)						105	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)	0	1	0	11	0	53	1	
Queuing Penalty (veh)	0	0	0	15	0	30	2	

Intersection: 3: Lester Rd & Monte Vista Ave (Low Project Volume - No Change)

Movement	EB	WB	NB
Directions Served	LTR	LTR	TR
Maximum Queue (ft)			
Average Queue (ft)			
95th Queue (ft)			
Link Distance (ft)			
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Monte Vista Ave & Project Dvwy

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	22	60
Average Queue (ft)	2	26
95th Queue (ft)	13	53
Link Distance (ft)		314
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10:

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 153

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.0	0.1	0.1	0.2
Total Del/Veh (s)	1.9	0.5	5.9	5.1	1.5
Vehicles Entered	402	321	13	25	761
Vehicles Exited	403	320	13	25	761
Hourly Exit Rate	403	320	13	25	761
Input Volume	401	322	13	25	761
% of Volume	100	100	100	100	100

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.8	0.0	0.1	0.2
Total Del/Veh (s)	18.6	16.0	14.6	23.4	17.3
Vehicles Entered	188	196	217	99	700
Vehicles Exited	187	197	217	99	700
Hourly Exit Rate	187	197	217	99	700
Input Volume	184	201	218	96	698
% of Volume	102	98	100	103	100

3: Lester Rd & Monte Vista Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.2	0.0	0.1
Total Del/Veh (s)	5.8	7.5	6.1	1.4	5.8
Vehicles Entered	208	123	130	61	522
Vehicles Exited	209	123	131	61	524
Hourly Exit Rate	209	123	131	61	524
Input Volume	209	122	134	60	526
% of Volume	100	100	98	101	100

4: Monte Vista Ave & Project Driveway Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	0.5	0.3	5.2	0.6
Vehicles Entered	413	326	24	763
Vehicles Exited	414	326	24	764
Hourly Exit Rate	414	326	24	764
Input Volume	410	326	24	760
% of Volume	101	100	100	100

10: Monte Vista Ave Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	1.8	1.0
Vehicles Entered	399	323	722
Vehicles Exited	400	324	724
Hourly Exit Rate	400	324	724
Input Volume	396	324	720
% of Volume	101	100	101

Total Network Performance

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	17.6
Vehicles Entered	1025
Vehicles Exited	1027
Hourly Exit Rate	1027
Input Volume	4481
% of Volume	23

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (ft)	19	3	18	4	1	36	30
Average Queue (ft)	1	0	1	0	0	10	12
95th Queue (ft)	11	3	9	4	2	33	30
Link Distance (ft)		1847		1059		706	1119
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	100		100		550		
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	49	172	45	146	47	68	56	107
Average Queue (ft)	11	69	11	56	12	54	28	41
95th Queue (ft)	35	134	33	112	39	81	64	82
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						14	0	
Queuing Penalty (veh)						30	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)		1		2		35	1	
Queuing Penalty (veh)		0		1		18	1	

Intersection: 3: Lester Rd & Monte Vista Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	TR	LT
Maximum Queue (ft)	81	101	99	1
Average Queue (ft)	49	45	29	0
95th Queue (ft)	73	76	77	2
Link Distance (ft)	432	1040	1166	56
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Monte Vista Ave & Project Driveway

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	36	40
Average Queue (ft)	7	17
95th Queue (ft)	29	44
Link Distance (ft)		302
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: Monte Vista Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 50

APPENDIX F
CUMULATIVE NO PROJECT AND PLUS PROJECT ANALYSIS WORKSHEETS

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.1	0.1	0.1
Total Del/Veh (s)	1.4	0.4	4.8	5.0	1.0
Vehicles Entered	272	450	9	31	762
Vehicles Exited	272	450	9	30	761
Hourly Exit Rate	272	450	9	30	761
Input Volume	272	451	8	33	763
% of Volume	100	100	109	92	100

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	1.1	0.0	0.2	0.5
Total Del/Veh (s)	27.4	26.4	20.6	31.0	25.4
Vehicles Entered	144	363	316	156	979
Vehicles Exited	143	361	315	158	977
Hourly Exit Rate	143	361	315	158	977
Input Volume	147	354	315	155	971
% of Volume	97	102	100	102	101

3: Lester Rd & Monte Vista Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.2	0.0	0.1
Total Del/Veh (s)	6.2	130.5	92.2	1.2	67.8
Vehicles Entered	130	162	192	105	589
Vehicles Exited	130	162	194	105	591
Hourly Exit Rate	130	162	194	105	591
Input Volume	128	162	192	101	584
% of Volume	101	100	101	104	101

10: Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.1	2.2	1.3
Vehicles Entered	290	425	715
Vehicles Exited	291	426	717
Hourly Exit Rate	291	426	717
Input Volume	291	426	718
% of Volume	100	100	100

Total Network Performance

Denied Del/Veh (s)	0.5
Total Del/Veh (s)	54.0
Vehicles Entered	1227
Vehicles Exited	1229
Hourly Exit Rate	1229
Input Volume	4913
% of Volume	25

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	L	TR	LTR	LTR
Maximum Queue (ft)	22	4	1	4	7	30	44
Average Queue (ft)	3	0	0	0	0	7	19
95th Queue (ft)	16	4	2	3	6	27	43
Link Distance (ft)		1847	1847		1053	694	1121
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	100			100			
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	86	140	152	352	155	73	56	189
Average Queue (ft)	22	55	31	124	47	64	27	77
95th Queue (ft)	57	109	95	268	121	75	66	151
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						48	1	
Queuing Penalty (veh)						155	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)	0	1	0	13	0	62	1	
Queuing Penalty (veh)	0	0	0	21	0	39	4	

Intersection: 3: Lester Rd & Monte Vista Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	TR	LT
Maximum Queue (ft)	79	486	490	3
Average Queue (ft)	41	200	182	0
95th Queue (ft)	66	512	493	3
Link Distance (ft)	432	1040	1166	56
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 10:

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 219

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.1	0.1	0.1
Total Del/Veh (s)	1.5	0.3	5.9	5.7	1.2
Vehicles Entered	442	354	12	28	836
Vehicles Exited	442	353	12	28	835
Hourly Exit Rate	442	353	12	28	835
Input Volume	435	355	12	30	832
% of Volume	102	100	100	93	100

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.8	0.0	0.2	0.3
Total Del/Veh (s)	19.0	16.5	15.6	24.2	17.9
Vehicles Entered	204	230	243	101	778
Vehicles Exited	203	230	243	101	777
Hourly Exit Rate	203	230	243	101	777
Input Volume	202	225	245	100	773
% of Volume	100	102	99	100	101

3: Lester Rd & Monte Vista Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.2	0.0	0.1
Total Del/Veh (s)	6.3	9.8	7.4	1.4	6.8
Vehicles Entered	241	137	148	73	599
Vehicles Exited	241	137	147	73	598
Hourly Exit Rate	241	137	147	73	598
Input Volume	237	136	153	70	596
% of Volume	102	101	96	105	100

10: Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.1	1.9	0.9
Vehicles Entered	451	351	802
Vehicles Exited	451	351	802
Hourly Exit Rate	451	351	802
Input Volume	445	351	796
% of Volume	101	100	101

Total Network Performance

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	18.4
Vehicles Entered	1111
Vehicles Exited	1112
Hourly Exit Rate	1112
Input Volume	4879
% of Volume	23

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	22	4	3	18	7	6	31	42
Average Queue (ft)	1	0	0	1	0	0	10	19
95th Queue (ft)	11	4	4	8	6	4	32	43
Link Distance (ft)		1847	1847		1053	1053	694	1121
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			100				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	53	170	58	148	51	71	56	124
Average Queue (ft)	11	75	12	65	15	58	30	43
95th Queue (ft)	34	136	38	124	44	81	68	93
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						19	1	
Queuing Penalty (veh)						45	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)		2		2		41	1	
Queuing Penalty (veh)		0		1		24	2	

Intersection: 3: Lester Rd & Monte Vista Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	TR	LT
Maximum Queue (ft)	100	114	115	2
Average Queue (ft)	54	50	36	0
95th Queue (ft)	84	91	87	2
Link Distance (ft)	432	1040	1166	56
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 10:

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 74

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.0	0.1	0.1	0.1
Total Del/Veh (s)	0.4	0.6	4.8	4.8	0.7
Vehicles Entered	277	459	10	33	779
Vehicles Exited	277	458	10	33	778
Hourly Exit Rate	277	458	10	33	778
Input Volume	278	459	9	33	779
% of Volume	100	100	108	101	100

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	1.1	0.1	0.2	0.5
Total Del/Veh (s)	26.3	28.7	21.3	32.5	26.5
Vehicles Entered	158	352	318	156	984
Vehicles Exited	158	354	318	156	986
Hourly Exit Rate	158	354	318	156	986
Input Volume	158	355	316	158	988
% of Volume	100	100	101	98	100

3: Lester Rd & Monte Vista Ave Performance by approach (Low Project Volume - No Change)

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)					
Total Del/Veh (s)					
Vehicles Entered					
Vehicles Exited					
Hourly Exit Rate					
Input Volume					
% of Volume					

4: Monte Vista Ave & Project Dvwy Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.6	0.6	6.4	1.2
Vehicles Entered	290	447	34	771
Vehicles Exited	291	447	34	772
Hourly Exit Rate	291	447	34	772
Input Volume	290	446	37	772
% of Volume	101	100	91	100

10: Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.2	2.1	1.3
Vehicles Entered	298	433	731
Vehicles Exited	298	433	731
Hourly Exit Rate	298	433	731
Input Volume	300	432	732
% of Volume	99	100	100

Total Network Performance

Denied Del/Veh (s)	0.5
Total Del/Veh (s)	60.9
Vehicles Entered	1263
Vehicles Exited	1269
Hourly Exit Rate	1269
Input Volume	5086
% of Volume	25

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	T	LTR	LTR
Maximum Queue (ft)	24	4	20	4	33	36
Average Queue (ft)	2	0	1	0	8	14
95th Queue (ft)	14	5	9	4	30	32
Link Distance (ft)		1847		1059	706	1119
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100		100			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	97	148	145	370	160	73	56	194
Average Queue (ft)	27	57	29	130	50	64	27	79
95th Queue (ft)	65	114	94	284	131	74	67	159
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						51	1	
Queuing Penalty (veh)						163	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)	0	1	0	15	0	63	1	
Queuing Penalty (veh)	0	1	1	24	0	39	4	

Intersection: 3: Lester Rd & Monte Vista Ave (Low Project Volume - No Change)

Movement	EB	WB	NB	SB
Directions Served				
Maximum Queue (ft)				
Average Queue (ft)				
95th Queue (ft)				
Link Distance (ft)				
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Monte Vista Ave & Project Dvwy

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	26	53
Average Queue (ft)	2	23
95th Queue (ft)	15	51
Link Distance (ft)		314
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10:

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 232

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.1	0.1	0.1
Total Del/Veh (s)	1.5	0.4	4.8	5.9	1.3
Vehicles Entered	453	370	18	31	872
Vehicles Exited	454	370	18	31	873
Hourly Exit Rate	454	370	18	31	873
Input Volume	456	366	16	30	868
% of Volume	100	101	112	103	101

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.8	0.0	0.2	0.3
Total Del/Veh (s)	19.7	17.8	15.5	23.6	18.4
Vehicles Entered	208	229	251	110	798
Vehicles Exited	208	228	251	109	796
Hourly Exit Rate	208	228	251	109	796
Input Volume	210	229	249	110	798
% of Volume	99	99	101	100	100

3: Lester Rd & Monte Vista Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.2	0.0	0.1
Total Del/Veh (s)	6.3	10.8	8.4	1.3	7.3
Vehicles Entered	240	140	155	69	604
Vehicles Exited	240	141	156	69	606
Hourly Exit Rate	240	141	156	69	606
Input Volume	239	140	153	70	602
% of Volume	100	101	102	99	101

4: Monte Vista Ave & Project Driveway Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	0.4	0.2	5.1	0.4
Vehicles Entered	465	374	26	865
Vehicles Exited	465	374	26	865
Hourly Exit Rate	465	374	26	865
Input Volume	467	370	24	862
% of Volume	100	101	108	100

10: Monte Vista Ave Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.2	1.9	1.0
Vehicles Entered	452	370	822
Vehicles Exited	451	370	821
Hourly Exit Rate	451	370	821
Input Volume	452	367	819
% of Volume	100	101	100

Total Network Performance

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	18.8
Vehicles Entered	1177
Vehicles Exited	1176
Hourly Exit Rate	1176
Input Volume	5107
% of Volume	23

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	23	3	6	22	6	6	35	48
Average Queue (ft)	1	0	0	2	0	0	13	20
95th Queue (ft)	10	2	4	12	4	4	36	45
Link Distance (ft)		1847	1847		1059	1059	694	1121
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			100				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	60	168	63	163	56	70	56	116
Average Queue (ft)	12	76	13	67	15	59	31	45
95th Queue (ft)	39	136	40	127	44	79	68	91
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						19	1	
Queuing Penalty (veh)						48	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)		2		3		42	1	
Queuing Penalty (veh)		0		2		25	2	

Intersection: 3: Lester Rd & Monte Vista Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	TR	LT
Maximum Queue (ft)	104	130	118	3
Average Queue (ft)	53	53	37	0
95th Queue (ft)	84	98	93	3
Link Distance (ft)	432	1040	1166	56
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Monte Vista Ave & Project Driveway

Movement	EB	WB	SB
Directions Served	L	TR	LR
Maximum Queue (ft)	36	2	44
Average Queue (ft)	7	0	18
95th Queue (ft)	30	2	44
Link Distance (ft)		659	290
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: Monte Vista Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 77

Final Transportation Impact Assessment

Monte Vista Collection Subdivision

Community of Denair, California

April 29, 2022

PREPARED FOR

LAZARES COMPANIES

STANISLAUS COUNTY

BTC
BARRIOS
TRANSPORTATION CONSULTING

Final Transportation Impact Assessment

Monte Vista Collection Subdivision

Community of Denair, California

Prepared for:
Lazares Companies
Stanislaus County

Prepared By:

BTC
BARRIOS
TRANSPORTATION CONSULTING

April 29, 2022

BTC-0017

Table of Contents

Appendices

Appendix A: Tentative Subdivision Map

Appendix B: LOS Criteria

Appendix C: Traffic Count Comparison

Appendix D: Existing Conditions Analysis Worksheets

Appendix E: Existing Plus Project Conditions Analysis Worksheets

Appendix F: Cumulative No Project and Plus Project Conditions Analysis Worksheets

List of Figures

List of Tables

1.0 INTRODUCTION

This report presents the analysis and findings of the Transportation Impact Assessment (TIA) for the Monte Vista Collection Subdivision (project) located in the community of Denair, Stanislaus County. This chapter discusses the TIA purpose, study locations and analysis scenarios, analysis methods, and report organization.

1.1 STUDY PURPOSE AND PROJECT DESCRIPTION

The study's purpose is to evaluate the transportation impacts of the project, a residential development. The project, located in the Stanislaus County community of Denair, proposes to construct 69 single-family residential units on an 18.61-acre parcel that is currently occupied by two residential units and accessory buildings (i.e., barn and garage). The parcel is located on the north side of Monte Vista Avenue between Waring Road and Lester Road. The project location is presented in **Figure 1-1**. The tentative subdivision map is presented in **Appendix A**. Vehicular access would be provided by a single access point on Monte Vista Avenue.

1.2 STUDY LOCATIONS AND ANALYSIS SCENARIOS

The following intersections were evaluated for the peak hour in the morning between 7:00 and 9:00 AM and evening between 4:00 and 6:00 PM:

1. Waring Road / Monte Vista Avenue
2. Lester Road / Main Street

In addition to peak hour intersection operations analysis, a daily roadway segment analysis was conducted for the following roadway segment:

1. Monte Vista Avenue between Waring Road and Lester Road

BTC

Figure 1-1

Project Vicinity Map

The following scenarios were evaluated:

- ***Existing*** – Existing conditions based on recent traffic counts.
- ***Existing Plus Project*** – Existing traffic counts plus traffic expected to be generated by the project
- ***Cumulative No Project*** – Forecasts for the cumulative scenario (year 2035) based on an annual traffic growth factor from the Three-County Travel Demand Model
- ***Cumulative with Project*** – Cumulative No Project forecasts plus traffic expected to be generated by the project

1.3 ANALYSIS METHODS

While vehicle miles of travel (VMT) are currently used and required within California for environmental assessments, Stanislaus County still has a policy to maintain level of service (LOS) C or better operations at intersections during the peak hour and LOS D or better on roadways (Daily LOS). These policies are in place to ensure that adequate traffic circulation and mobility are provided in Stanislaus County.

LOS is a qualitative description of traffic flow from a vehicle driver's perspective based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined ranging from LOS A (free-flow conditions) to LOS F (over capacity conditions). LOS E corresponds to operations "at capacity." When volumes exceed capacity, stop-and-go conditions result, and operations are designated LOS F. **Appendix B** provides a detailed discussion on the LOS criteria used to evaluate signalized and unsignalized intersections for the peak hour and roadways for a daily condition.

1.3.1 VEHICLE MILES OF TRAVEL

In response to Senate Bill 743 (SB 743), the Office of Planning and Research (OPR) has updated the California Environmental Quality Act (CEQA) guidelines to include new transportation-related evaluation metrics. Within California, VMT is the transportation metric for determining project impacts for CEQA: the metric was previously LOS. For this study a preliminary assessment of VMT generated by the proposed project was prepared for informational purposes only as Stanislaus County has not yet adopted significance thresholds related to VMT.

1.4 REPORT ORGANIZATION

This report is divided into 7 chapters as described below:

- **Chapter 1 – Introduction** discusses the purpose and organization of the report.

- **Chapter 2 – Existing Conditions** describes the transportation system in the project vicinity, including the surrounding roadway network morning and evening peak period intersection turning movement volumes, existing bicycle and pedestrian facilities, and intersection operations.
- **Chapter 3 – Project Characteristics** presents relevant project information, such as the project components and project trip generation, distribution, and assignment.
- **Chapter 4 – Existing Plus Project Traffic Conditions** addresses the existing conditions with the project.
- **Chapter 5 – Cumulative Traffic Conditions** addresses the future conditions (2035), both without and with the project.
- **Chapter 6 – Vehicle Miles of Travel** presents the results of the VMT assessment conducted for the site.
- **Chapter 7 – Site Plan Review** describes project access and circulation for all travel modes, including an assessment of traffic control at the internal intersections.

2.0 EXISTING CONDITIONS

This chapter describes the transportation facilities in the project study area, including the surrounding roadway network, pedestrian, and bicycle facilities in the project site vicinity. Existing intersection operations are also described.

2.1 ROADWAY SYSTEM

The following discusses the roadways that would provide access to the site and/or are most likely to experience direct traffic impacts, if any, from the proposed project.

Monte Vista Avenue is an east-west two-lane minor arterial in the vicinity of the project. Monte Vista Avenue connects Denair to Turlock and SR 99 to the west and rural Stanislaus County to the east. The posted speed limit in the vicinity of the project site is 50 mph.

Main Street is a two-lane minor arterial that provides primary east-west access through Denair. Main Street extends from the Monte Vista Avenue-Main Street junction and continues easterly past Santa Fe Avenue to Gratton Road where it terminates. The posted speed limit is 35 mph (25 mph when school children are present).

Waring Road is a north-south two-lane major collector that terminates at Taylor Road to the north and Hawkeye Avenue to the south. The posted speed limit is 40 mph.

Lester Road is a north-south two-lane major collector that extends from Hawkeye Avenue to the south to past Zeering Road to the north where it terminates. The posted speed limit is 25 mph in the project vicinity.

2.2 EXISTING PEDESTRIAN AND BICYCLE FACILITIES

2.2.1 PEDESTRIAN FACILITIES

Pedestrian facilities typically include sidewalks, crosswalks, pedestrian signals and multi-use trails. Between Waring Road and Lester Road, sidewalk is currently provided on the north and south side of Monte Vista Avenue near the intersections. However, there is a large gap in the sidewalk system (over 1,000' gap) on both sides of Monte Vista Avenue between Waring Road and Lester Road. There is no sidewalk along the proposed project's frontage. Crosswalks are not provided at the intersection of Monte

Vista Avenue with Waring Road. Crosswalks and pedestrian signals are provided on all legs of the Monte Vista Avenue/Lester Road intersection. The crosswalks are painted yellow to alert drivers that they are in a school zone. There are no multi-use trails in the vicinity of the project.

2.2.2 BICYCLE FACILITIES

Bicycle facilities include the following:

- **Bike paths (Class I)** – Paved trails that are separated from roadways. These trails are sometimes shared with pedestrians.
- **Bike lanes (Class II)** – Lanes on roadways designated for use by bicycles through striping, pavement legends, and signs.
- **Bike routes (Class III)** – Roadways designated for bicycle use by signs only; may or may not include additional pavement width for cyclists.
- **Separated Bikeway (Class IV)** – Separated bikeways, also referred to as cycle tracks or protected bikeways, are bikeways for the exclusive use of bicycles which are physically separated from vehicle traffic. Types of separation may include, but are not limited to, grade separation, flexible posts, physical barriers, or on-street parking.

In the immediate project vicinity, there are no bicycle facilities provided on Monte Vista Avenue, Waring Road, or Lester Road.

2.3 EXISTING TRAFFIC COUNTS

Weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak period intersection turning movement counts were collected in September 2021, while local schools were in session, at the following two study intersections:

1) Monte Vista Avenue/Waring Road; and
2) Main Street/Lester Road

A 48-hour traffic volume count was collected in September 2021 on Monte Vista Avenue between Waring Road and Lester Road. In addition to vehicle counts, pedestrian and bicycle counts were also collected at the study intersections. The COVID-19 pandemic has impacted travel and, in some cases, resulted in lower traffic volumes on roadways compared to pre-pandemic conditions. To determine what adjustments, if any, should be made to the traffic counts, a comparison was made to historical 24-hour traffic counts provided by Stanislaus County at the following locations:

- 2017: Monte Vista Avenue east of Waring Road
- 2017: Monte Vista Avenue west of Waring Road
- 2016: Main Street east of Lester Road

The new counts were compared to the historical counts to identify potential adjustment factors. **Appendix C** provides a comparison of the data. Based on the comparison, only one small adjustment was made (westbound approach to the Main Street/Lester Road intersection in the PM) because the new 2021 traffic counts are substantially higher than the pre-pandemic counts. To avoid underestimating the potential project impacts, the resulting existing conditions volumes are equal to or greater than any of the historical counts provided by Stanislaus County. **Figure 2-1** presents the Existing Conditions AM and PM peak hour traffic volumes and lane configurations at the study intersections.

2.4 EXISTING INTERSECTION LEVELS OF SERVICE

Existing intersection lane configurations, signal timings, and peak hour turning movement volumes were used to calculate the levels of service for the study intersections during each peak hour using the Synchro/SimTraffic 11.0 software program, as presented in **Table 2-1.** Observed peak hour factors[1] were used at all intersections for the existing analysis. Pedestrian and bicycle activity were also factored into the analysis. Detailed intersection LOS calculation worksheets are presented in **Appendix D**.

The analysis results presented below are consistent with field observations. At the Monte Vista Avenue/Waring Road intersection the vehicles on the side-street stop-controlled approaches and the major street left-turns appeared to have sufficient gaps in the major street through traffic stream to perform their maneuver with minimal delay. The side-street approaches operate at LOS A during the AM and PM peak hour.

At the Main Street/Lester Avenue intersection the traffic operations were observed to be worse in the AM peak hour than the PM peak hour. The intersection operates at LOS C and LOS B during the AM peak hour and PM peak hour, respectively. Even though the AM peak hour is from 7:15 AM to 8:15 AM at this location, the peak congestion was mostly limited to the peak 15 minutes between 7:45 and 8:00 AM. This is primarily attributed to the bell schedules at both Denair High School and Denair Middle School that start first period at 8 AM. The AM peak hour factor at the Main Street/Lester Avenue intersection is low

[1] The peak hour factor is the relationship between the peak 15-minute flow rate and the full hourly volume: PHF = Hourly volume / (4 x (volume during the peak 15 minutes of flow)). The analysis is based on peak rates of flow occurring within the peak hour because substantial short-term fluctuations may occur during a peak hour.

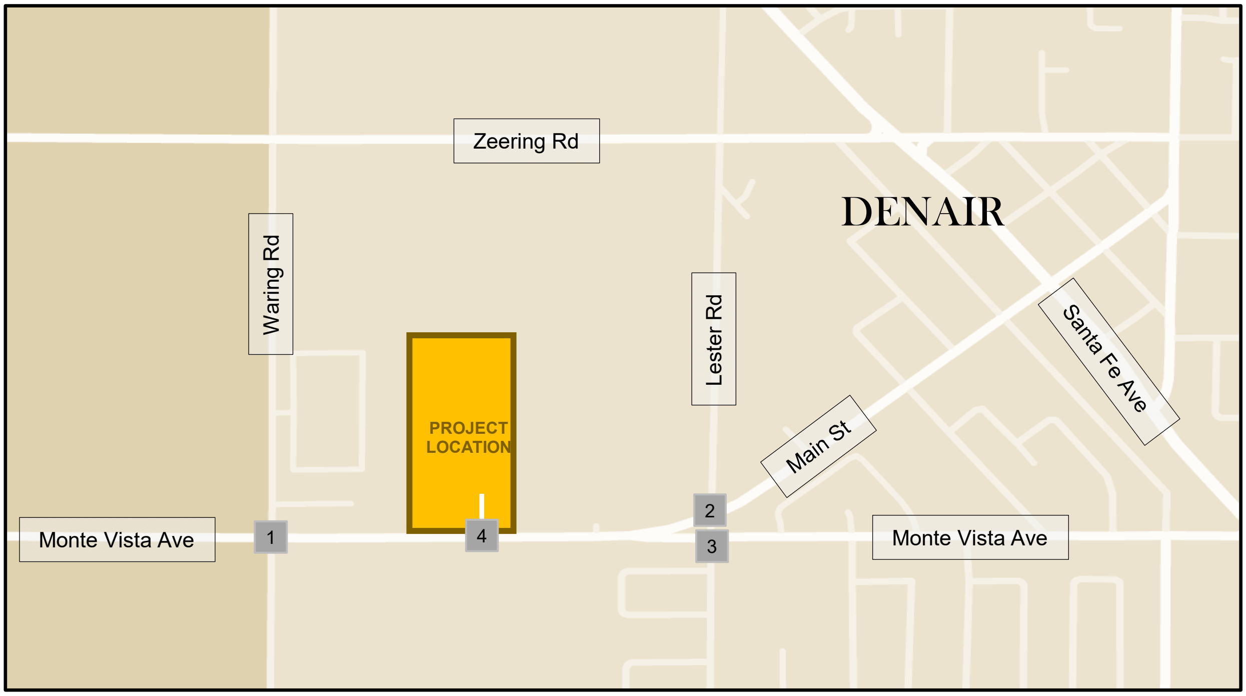
at 0.72 which indicates a short spike in traffic congestion for 15 minutes compared to traffic congestion in the remaining 45 minutes of the peak hour.

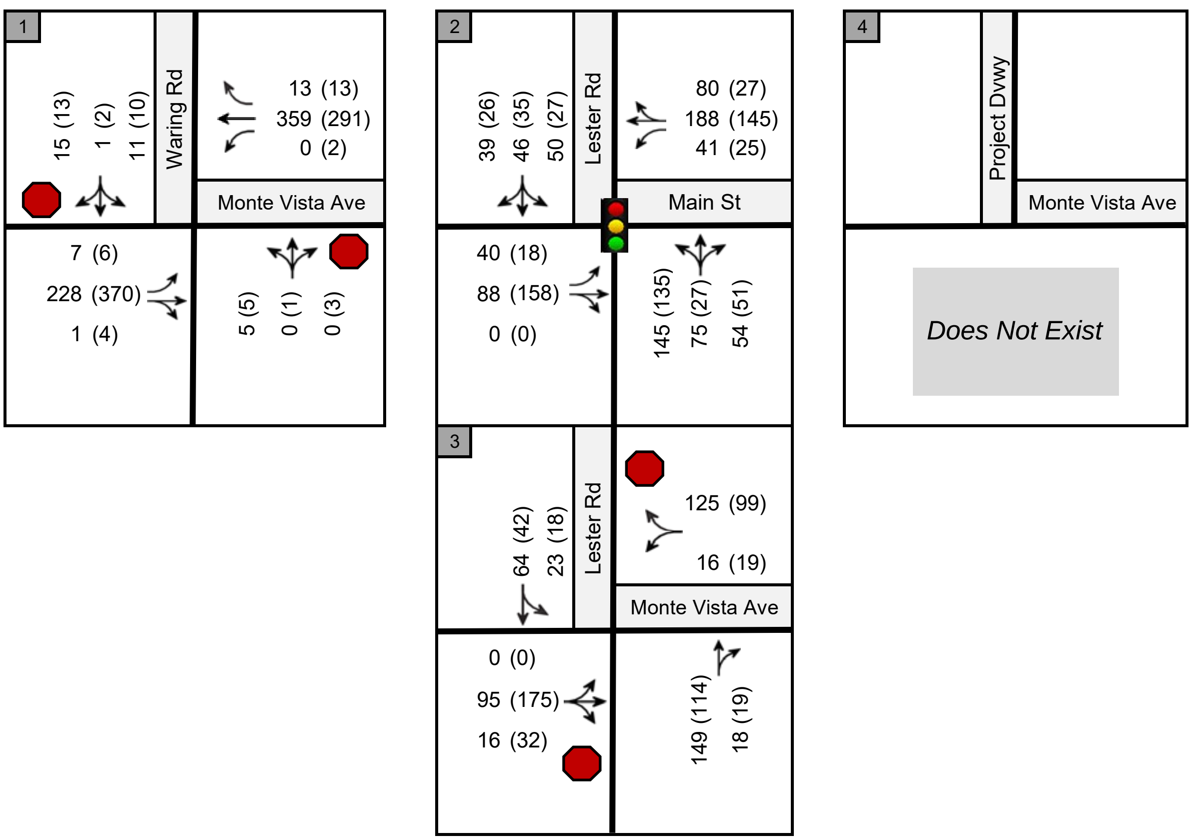
At the Monte Vista Avenue/Lester Road intersection, the traffic operations were regularly impacted by the vehicle queue spillback from the northbound approach to the Main Street/Lester Road intersection during the AM peak hour. The vehicle queue spillback results in the westbound approach to the Monte Vista Avenue/Lester Road intersection operating at LOS F during the AM peak hour. During the PM peak hour, the northbound queue at the Main Street/Lester Road intersection had minimal impact on the traffic operations at the Monte Vista/Lester Road intersection. The westbound approach to the Monte Vista Avenue/Lester Road intersection operates at LOS A during the PM peak hour. There is "Keep Clear" striping in the middle of the intersection to keep vehicles from queuing in the middle of the intersection that is obeyed by most drivers. At the Monte Vista Avenue/Lester Road intersection the northbound traffic is not required to stop; however, when long northbound queues developed at the Main Street/Lester Road intersection the Monte Vista Avenue/Lester Road intersection operates similar to all-way stop control where northbound traffic would allow side-street traffic to enter the intersection in a one-to-one ratio (i.e., one northbound traveling vehicle for every one side-street vehicle).

Table 2-1: Existing Conditions Peak Hour Intersection LOS Summary

Intersection	Control[1]	Peak Hour	Delay[2]	LOS
1. Monte Vista Avenue / Waring Road	SSSC	AM PM	5 (NB) 5 (NB)	A A
2. Main Street / Lester Road[3]	Signal	AM PM	23 17	C B
3. Monte Vista Avenue / Lester Road	SSSC	AM PM	**55 (WB)** 8 (WB)	**F** A

Notes:
Bold denotes locations that operate at an unacceptable service level.
1. SSSC = side-street stop-control; Signal = signalized intersection
2. For side-street stop-controlled intersections the worst approach/movement delay is reported. For signalized intersections the overall weighted average delay is reported.
3. The traffic analysis assumes a short right-turn lane on the northbound and westbound approaches even though a right-turn lane is not striped. Based on field observations, right-turning vehicles were consistently observed bypassing through vehicles waiting in queue due to the width of the pavement provided.
Source: BTC, 2021





Map Key

1 Study Intersection

Volumes Key

XX (YY) AM (PM) Peak Hour Traffic Volumes

Traffic Control Key

Stop Sign

Traffic Signal

BTC

Figure 2-1

Existing Traffic Volumes and Lane Configurations

Ninety-fifth percentile vehicle queues were calculated for each of the study intersections and the results are presented in **Table 2-2**. Detailed queuing reports are provided in **Appendix D**. With the exception of northbound approach to the Main Street/Lester Road intersection and northbound approach to the Monte Vista Avenue/Lester Road intersection, the existing 95th percentile queues are currently accommodated within the available storage.

Table 2-2: Existing 95th Percentile Queueing Analysis

Intersection	Movement[1]	Available Storage (ft)	AM Peak Hour 95th Percentile Queue (ft)	PM Peak Hour 95th Percentile Queue (ft)
1. Monte Vista Avenue / Waring Road	NB - LTR	>1,000	23	26
	SB - LTR	185	30	29
	EB – L	100	11	10
	EB – TR	>1,000	0	0
	WB – L	100	0	9
	WB – T	>1,000	0	0
	WB - R	550	0	0
2. Main Street / Lester Road	NB - LTR	75	**>75**	**>75**
	SB - LTR	>1,000	135	74
	EB – L	125	52	28
	EB – TR	>1,000	96	122
	WB – L	100	80	37
	WB – TR	>1,000	203	110
3. Monte Vista Avenue / Lester Road	NB – TR	175	**215**	73
	SB – LT	75	0	0
	EB – TR	350	64	74
	WB - LR	350	271	77

Notes:
Bold denotes locations that exceed available storage.
1. NB-northbound, SB-southbound, EB-eastbound, WB-westbound, L-left turn, T-through, R-right turn
Source: BTC, 2021

2.4.1 DAILY ROADWAY SEGMENT OPERATION

The existing average daily traffic volume and LOS on Monte Vista Avenue between Waring Road and Lester Road is presented in **Table 2-3**. The roadway operates at LOS B under existing conditions.

Table 2-3: Monte Vista Avenue ADT and LOS Under Existing Conditions

Segment	Daily Traffic[1]	LOS
1. Monte Vista Avenue between Waring Road and Lester Road	8,000	B

Notes:
1. Average daily two-way traffic.
Source: BTC, 2021.

2.5 COLLISION DATA

Table 2-4 summarizes the collision rates at the three existing intersections for the three-year period between January 2017 and December 2019 based on the Statewide Integrated Traffic Records System (SWITRS) database. The State average is the basic average crash rate for a similar intersection presented in the *2018 Crash Data on California State Highways*. One of the study intersections (Monte Vista Avenue/Lester Road) has a collision rate that is higher than the statewide average for a similar facility.

Table 2-4: Collision History at Existing Intersections (January 2017 to December 2019)

Intersection	Number of Collisions	Collision Rate (collisions/million entering vehicles)	
		Actual	State Average
	Total	Total	Total
1. Monte Vista Avenue / Waring Road	2	0.12	0.25
2. Main Street / Lester Road	5	0.36	0.54
3. Monte Vista Avenue / Lester Road	5	0.60	0.25

Source: Statewide Integrated Traffic Records System (SWITRS); BTC, 2021.

3.0 PROJECT CHARACTERISTICS

This chapter provides an overview of the proposed project components and addresses the proposed project trip generation, distribution, and assignment characteristics, allowing for an evaluation of project impacts on the surrounding roadway network. The amount of traffic associated with the project was estimated using a three-step process:

1. **Trip Generation** – The *amount* of vehicle traffic entering/exiting the project site was estimated.
2. **Trip Distribution** – The *direction* trips would use to approach and depart the site was projected.
3. **Trip Assignment** – Trips were then *assigned* to specific roadway segments and intersection turning movements.

3.1 PROJECT DESCRIPTION

The project, located in the Stanislaus County community of Denair, proposes to construct 69 single-family residential units on an 18.61-acre parcel that is currently occupied by two residential units and accessory buildings (i.e., barn and garage). The parcel is located on the north side of Monte Vista Avenue between Waring Road and Lester Road. The project site is bound by a mobile home park (Country Squire Estates)/single-family residential (Hideaway Terrance) to the west, Denair High School to the east, undeveloped land to the north, and Monte Vista Avenue to the south. Vehicular access would be provided by a single access point on Monte Vista Avenue. The project would widen Monte Vista Avenue along the project's frontage to match the existing roadway width provided near the Waring Road intersection. The roadway widening would allow for an exclusive eastbound left-turn lane to be provided into the project site.

3.2 PROJECT TRIP GENERATION

Trip generation refers to the process of estimating the amount of vehicular traffic a project would add to the surrounding roadway system. Estimates are created for the daily condition and for the peak one-hour period during the morning and evening commute when traffic volumes on the adjacent streets are typically the highest. Project trip generation was estimated using rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition), with the resulting estimates presented in **Table 3-1**. The project trip generation takes into consideration the existing trip generation from the two single-family homes on the project site. The project is expected to generate approximately 632 new daily vehicle trips, including approximately 50 morning peak hour and 66 evening peak hour trips.

Table 3-1: Vehicle Trip Generation Estimates

Use	Size	Weekday						
		Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
New Single Family Homes[1]	69 dwelling units	651	13	38	51	43	25	68
Existing Single Family Homes[1]	2 dwelling units	-19	0	-1	-1	-1	-1	-2
	Total New Project Trips	***632***	***13***	***37***	***50***	***42***	***24***	***66***

1. ITE land use category 210 – Single-Family Homes (Adj Streets, 7-9A, 4-6P):
   Daily: (T) = 9.44 (X)
   AM Peak Hour: T = 0.74(X); Enter = 25%; Exit = 75%
   PM Peak Hour: T = 0.99 (X); Enter = 63%; Exit = 37%

Source: *Trip Generation Manual* (10th Edition); BTC, 2021

3.3 PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

Project trip distribution refers to the directions of approach and departure that vehicles would take to access and leave the site. Estimates of project trip distribution were developed based on engineering judgement using existing traffic count data and land use patterns. The trip distribution percentages and traffic assignment are shown on **Figure 3-1**.

Map Key

1 Study Intersection

Volumes Key

XX (YY) AM (PM) Peak Hour Traffic Volumes

BTC

Figure 3-1

Project Trip Distribution and Assignment

4.0 EXISTING PLUS PROJECT CONDITIONS

This chapter evaluates potential off-site traffic impacts under Existing Plus Project conditions.

4.1 EXISTING PLUS PROJECT TRAFFIC VOLUMES

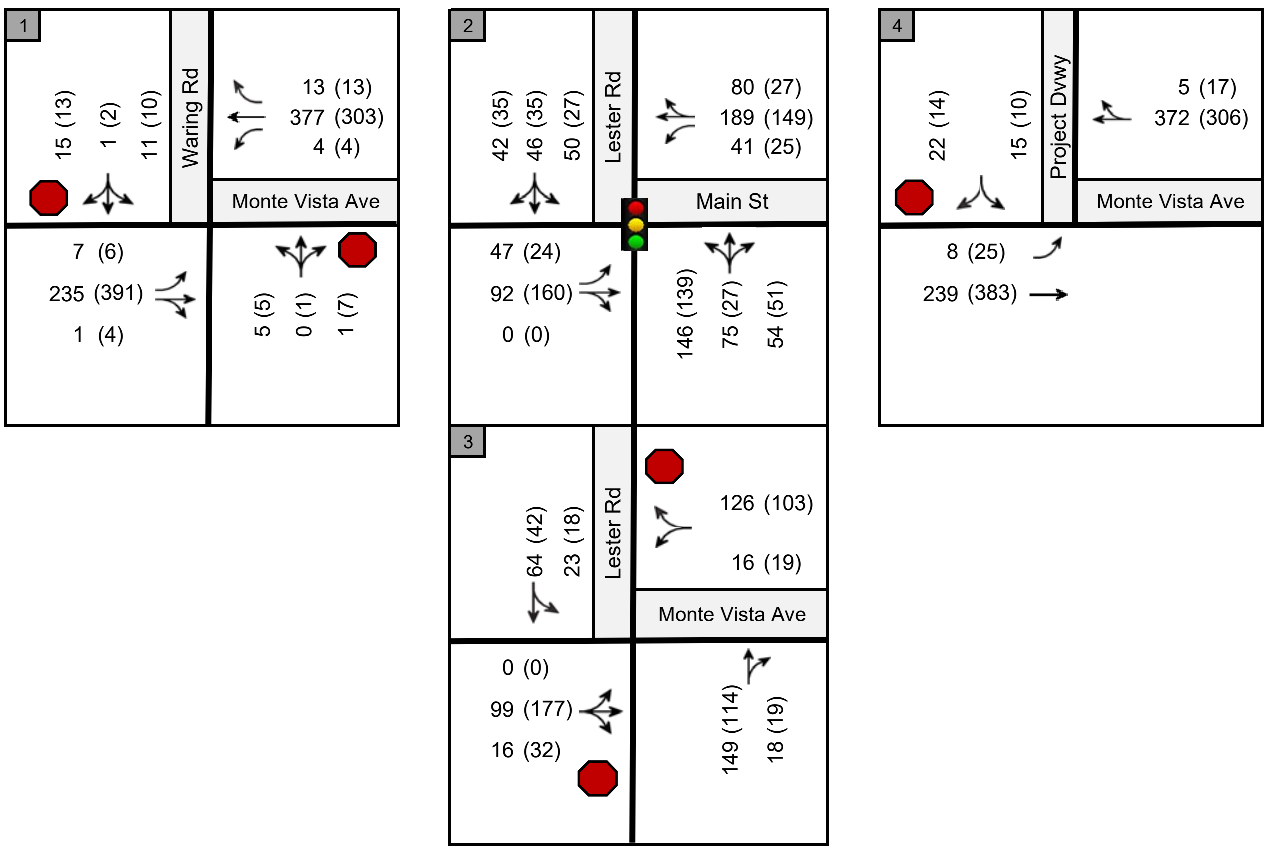
The project traffic volumes on **Figure 3-1** were added to the existing traffic volumes from **Figure 2-1** to estimate the Existing Plus Project traffic volumes, as shown on **Figure 4-1**. The greatest number of projects trips (39) would be added to the Monte Vista Avenue/Waring Road intersection during the PM peak hour, while the least number of project trips (5) would be added to the Monte Vista Avenue/Lester Road intersection during the AM peak hour.

4.2 EXISTING PLUS PROJECT CONDITIONS

4.2.1 INTERSECTION OPERATIONS

Existing Plus Project intersection operations were evaluated using the same methods described in Chapter 1. The Existing and Existing Plus Project analysis results are presented in **Table 4-1**, based on the traffic volumes and intersection configurations presented on **Figure 4-1**. Detailed intersection LOS calculation worksheets are presented in **Appendix E**. The project is not expected to add a substantial number of trips to the roadway network and as a result the intersection operations would remain relatively unchanged compared to Existing conditions. The westbound approach to the Monte Vista Avenue/Lester Road intersection is anticipated to continue to operate at LOS F conditions under Existing Plus Project conditions in the AM peak hour. The project is anticipated to add 1 vehicle trip to the westbound approach of the Monte Vista Avenue/Lester Road intersection in the AM peak hour. The project driveway is anticipated to operate at acceptable LOS A during the AM and PM peak hour.

Ninety-fifth percentile vehicle queues were calculated for each of the study intersections under Existing Plus Project conditions and the results are presented in **Table 4-2**. Detailed queuing reports are provided in **Appendix E**. As shown in Table 4-2, the 95th percentile queues under Existing Plus Project conditions remain relatively unchanged compared to Existing conditions.



Map Key

1 Study Intersection

Volumes Key

XX (YY) AM (PM) Peak Hour Traffic Volumes

Traffic Control Key

Stop Sign

Traffic Signal

BTC

Figure 4-1

Existing Plus Project Traffic Volumes

Table 4-1: Existing Plus Project Conditions Peak Hour Intersection LOS Summary

Intersection	Control[1]	Peak Hour	Existing		Existing Plus Project	
			Delay[2]	LOS	Delay[2]	LOS
1. Monte Vista Avenue / Waring Road	SSSC	AM PM	5 (NB) 5 (NB)	A A	5 (NB) 6 (NB)	A A
2. Main Street / Lester Road[3]	Signal	AM PM	23 17	C B	24 17	C B
3. Monte Vista Avenue / Lester Road	SSSC	AM PM	**55 (WB)** 8 (WB)	**F** A	**55 (WB)** 8 (WB)	**F** A
4. Monte Vista Avenue / Project Driveway	SSSC	AM PM	n/a	n/a	6 (SB) 5 (SB)	A A

Notes:
Bold denotes locations that operate at an unacceptable service level.
1. SSSC = side-street stop-control; Signal = signalized intersection
2. For side-street stop-controlled intersections the worst approach/movement delay is reported. For signalized intersection the overall weighted average delay is reported.
3. The traffic analysis assume a short right-turn lane on the northbound and westbound approaches even though a right-turn lane is not striped. Based on field observations, right-turning vehicles were consistently observed bypassing through vehicles waiting in queue due to the width of the pavement provided.

Table 4-2: Existing and Existing Plus Project 95th Percentile Queueing Analysis

			Existing		Existing Plus Project	
Intersection	**Movement[1]**	**Available Storage (ft)**	**AM Peak Hour 95th Percentile Queue (ft)**	**PM Peak Hour 95th Percentile Queue (ft)**	**AM Peak Hour 95th Percentile Queue (ft)**	**PM Peak Hour 95th Percentile Queue (ft)**
1. Monte Vista Avenue / Waring Road	NB - LTR	>1,000	23	26	23	33
	SB - LTR	185	30	29	30	30
	EB – L	160	11	10	13	11
	EB – TR	>1,000	0	0	0	0
	WB – L	150	0	9	6	9
	WB – T	>1,000	0	0	0	0
	WB - R	550	0	0	0	0
2. Main Street / Lester Road	NB - LTR	75	**>75**	**>75**	**>75**	**>75**
	SB - LTR	>1,000	135	74	135	82
	EB – L	125	52	28	56	35
	EB – TR	>1,000	96	122	107	134
	WB – L	100	80	37	80	37
	WB – TR	>1,000	203	110	221	112
3. Monte Vista Avenue / Lester Road	NB – TR	175	**215**	73	**215**	77
	SB – LT	75	0	0	0	0
	EB – TR	350	64	74	64	74
	WB - LR	350	271	77	271	77
4. Monte Vista Avenue / Project Driveway	SB - LTR	150	n/a	n/a	53	44
	EB – L	100			13	29
	EB – T	>1,000			0	0
	WB - TR	>1,000			0	0

Notes:
Bold denotes locations that exceed available storage.
1. NB-northbound, SB-southbound, EB-eastbound, WB-westbound, L-left turn, T-through, R-right turn
Source: BTC, 2021

4.2.2 DAILY ROADWAY SEGMENT OPERATION

The Existing Plus Project average daily traffic volume and LOS on Monte Vista Avenue between Waring Road and Project Driveway and Project Driveway and Lester Road is presented in **Table 4-3**. The roadway continues to operate at LOS B under Existing Plus Project conditions.

Table 4-3: Monte Vista Avenue ADT and LOS Under Existing Plus Project Conditions

Segment	Existing		Existing Plus Project	
	Daily Traffic[1]	LOS	Daily Traffic[1]	LOS
1. Monte Vista Avenue between Waring Road and Project Driveway	8,000	B	8,400	B
2. Monte Vista Avenue between Project Driveway and Lester Road	8,000	B	8,300	B

Notes:
1. Average daily two-way traffic.
Source: BTC, 2021.

5.0 CUMULATIVE CONDITIONS

This chapter evaluates potential off-site traffic impacts under Cumulative No Project and Cumulative Plus Project conditions. Cumulative conditions reflect year 2035 which is the Stanislaus County General Plan horizon year. Under Cumulative No Project conditions it was assumed that Monte Vista Avenue east of Waring Road and along the project frontage would be widened to a 110' cross section that could accommodate two through lanes in each direction and a median turn lane. The intersections of Lester Road with Main Street and Monte Vista Avenue were assumed to remain at their existing configuration.

5.1 CUMULATIVE NO PROJECT AND PLUS PROJECT TRAFFIC VOLUMES

The Three-County Travel Demand Model (Three-County TDM) was used to develop an annual growth factor in the project area to estimate AM and PM peak hour traffic volumes for Cumulative No Project conditions. Based on the Three-County TDM, the annual growth rate in the AM peak hour and PM peak hour is 1.0% per year. Cumulative Plus Project traffic volumes were developed by adding the project trips to the Cumulative No Project traffic volumes. The Cumulative No Project and Cumulative Plus Project traffic volumes are presented on **Figure 5-1** and **Figure 5-2**, respectively.

5.2 CUMULATIVE NO PROJECT AND PLUS PROJECT CONDITIONS

5.2.1 INTERSECTION OPERATIONS

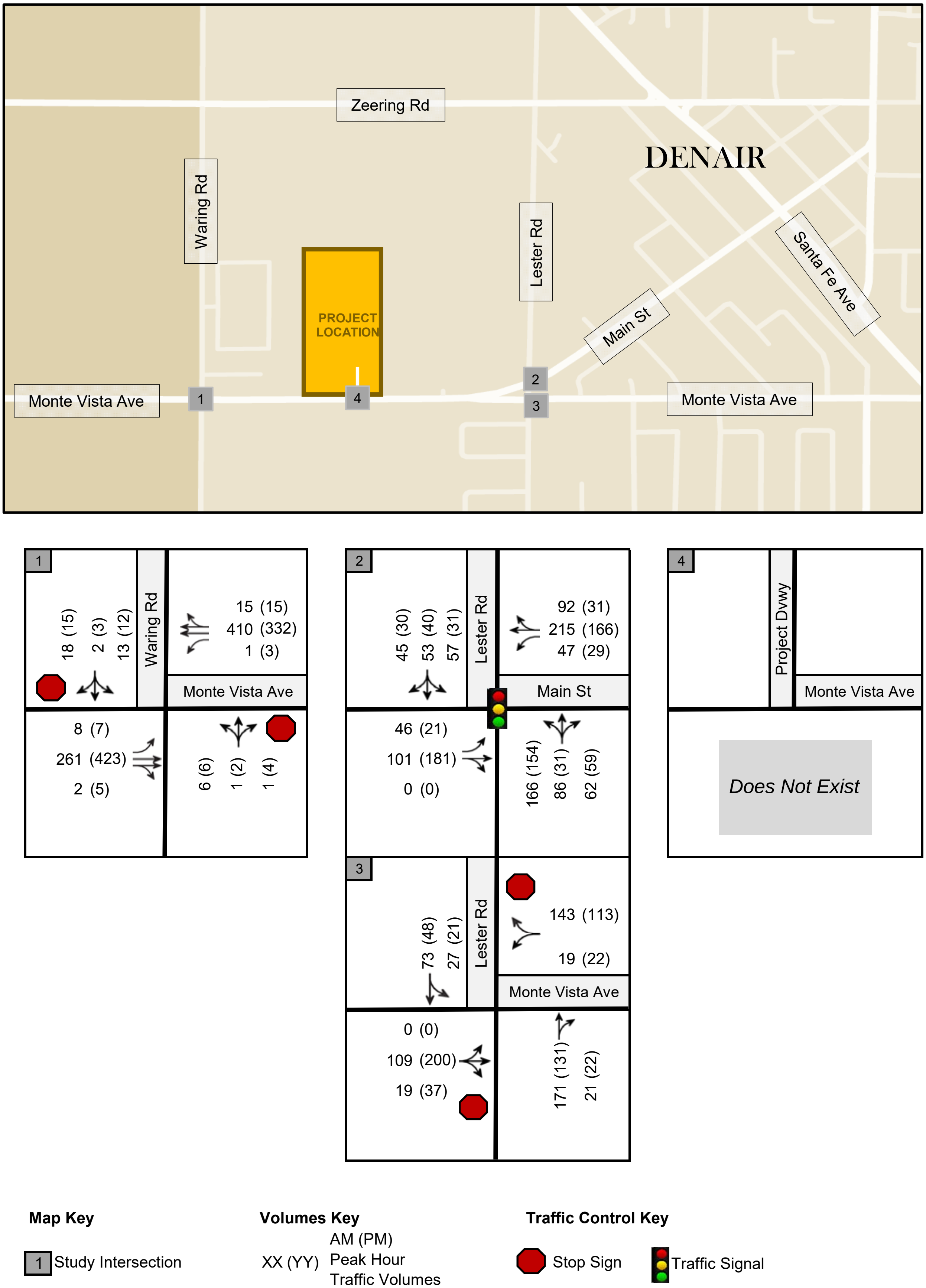
Cumulative No Project and Cumulative Plus Project intersection operations were evaluated using the same methods described in Chapter 1. The Cumulative No Project and Cumulative Plus Project analysis results are presented in **Table 5-1**. Detailed intersection LOS calculation worksheets are presented in **Appendix F**.

The project is not expected to add a substantial number of trips to the roadway network and as a result the intersection operations under Cumulative Plus Project conditions would remain relatively unchanged compared to Cumulative No Project conditions. The westbound approach to the Monte Vista Avenue/Lester Road intersection is anticipated to continue to operate at LOS F conditions under Cumulative No Project and Cumulative Plus Project conditions in the AM peak hour. The project is anticipated to add 1 vehicle trip on the westbound approach in the AM peak hour. The project driveway is anticipated to operate at acceptable LOS A during the AM and PM peak hour.

Table 5-1: Cumulative No Project and Plus Project Conditions Peak Hour Intersection LOS Summary

Intersection	Control[1]	Peak Hour	Cumulative No Project		Cumulative Plus Project	
			Delay[2]	LOS	Delay[2]	LOS
1. Monte Vista Avenue / Waring Road	SSSC	AM PM	5 (SB) 6 (SB)	A A	5 (SB) 6 (SB)	A A
2. Main Street / Lester Road[3]	Signal	AM PM	25 18	C B	26 18	C B
3. Monte Vista Avenue / Lester Road	SSSC	AM PM	**>100 (WB)** 10 (WB)	**F** A	**>100 (WB)** 11 (WB)	**F** B
4. Monte Vista Avenue / Project Driveway	SSSC	AM PM	n/a	n/a	6 (SB) 5 (SB)	A A

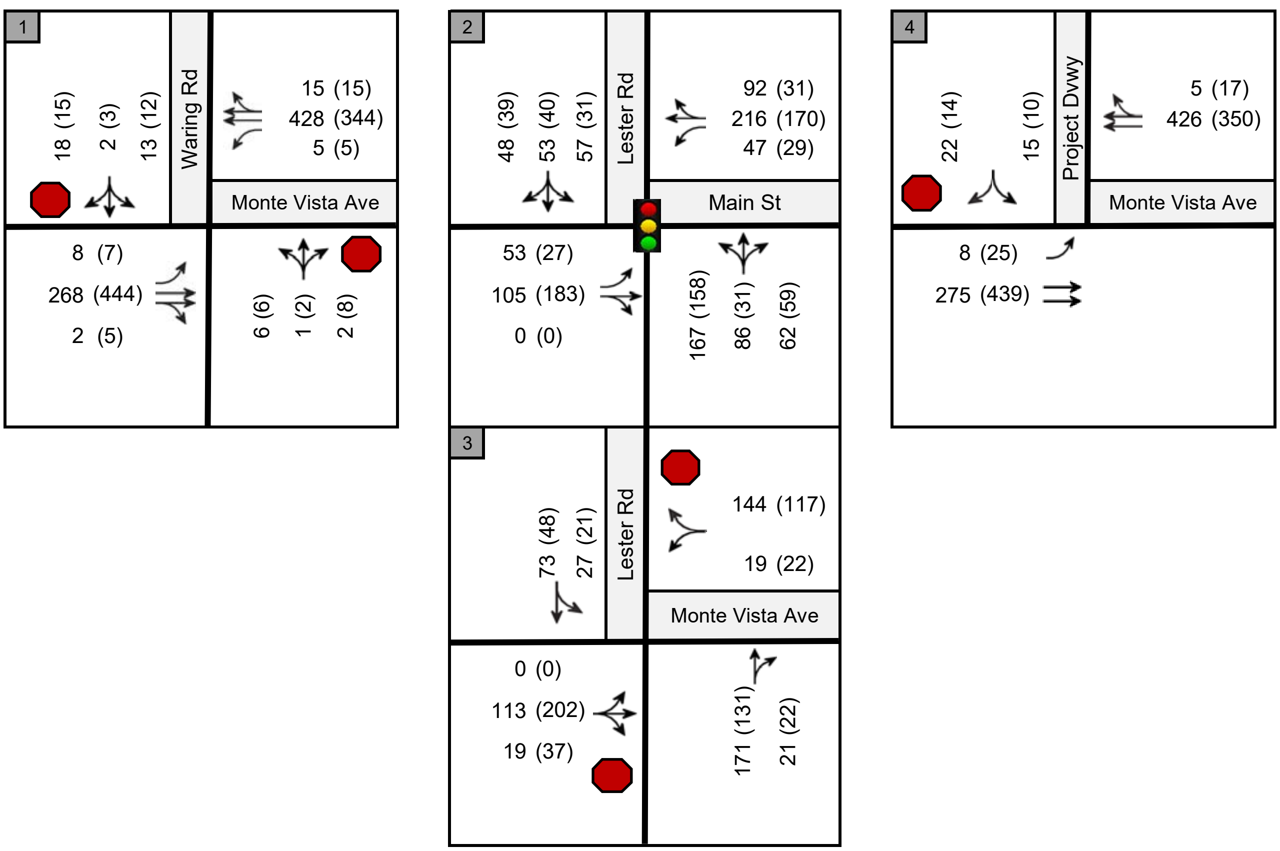
Notes:
1. SSSC = side-street stop-control; Signal = signalized intersection
2. For side-street stop-controlled intersections the worst approach/movement delay is reported. For signalized intersection the overall weighted average delay is reported.
Source: BTC, 2021



BTC

Figure 5-1

Cumulative No Project Traffic Volumes and Lane Configurations



Map Key

1 Study Intersection

Volumes Key

XX (YY) AM (PM) Peak Hour Traffic Volumes

Traffic Control Key

Stop Sign

Traffic Signal

BTC

Figure 5-2

Cumulative Plus Project Traffic Volumes

Ninety-fifth percentile vehicle queues were calculated for each of the study intersections under Cumulative No Project and Cumulative Plus Project conditions and the results are presented in **Table 5-2**. Detailed queuing reports are provided in **Appendix F**. As shown in Table 5-2, the 95th percentile queues under Cumulative Plus Project conditions remain relatively unchanged compared to Cumulative No Project conditions.

Table 5-2: Cumulative No Project and Plus Project 95th Percentile Queueing Analysis

			Cumulative No Project		Cumulative Plus Project	
Intersection	**Movement[1]**	**Available Storage (ft)**	**AM Peak Hour 95th Percentile Queue (ft)**	**PM Peak Hour 95th Percentile Queue (ft)**	**AM Peak Hour 95th Percentile Queue (ft)**	**PM Peak Hour 95th Percentile Queue (ft)**
1. Monte Vista Avenue / Waring Road	NB - LTR	>1,000	27	32	28	36
	SB - LTR	185	43	43	44	45
	EB – L	160	16	11	16	11
	EB – TR	>1,000	0	0	0	0
	WB – L	150	3	8	8	12
	WB – TR	>1,000	0	0	0	0
2. Main Street / Lester Road	NB - LTR	75	**>75**	**>75**	**>75**	**>75**
	SB - LTR	>1,000	151	93	153	93
	EB – L	125	57	34	66	39
	EB – TR	>1,000	109	136	120	136
	WB – L	100	95	38	95	40
	WB – TR	>1,000	268	124	268	127
3. Monte Vista Avenue / Lester Road	NB – TR	175	**493**	87	**493**	93
	SB – LT	75	0	0	0	0
	EB – TR	350	66	84	66	84
	WB - LR	350	**512**	91	**512**	98
4. Monte Vista Avenue / Project Driveway	SB - LTR	150	n/a	n/a	50	44
	EB – L	100			14	36
	EB – T	>1,000			0	0
	WB - TR	>1,000			0	0

Notes:
1. NB-northbound, SB-southbound, EB-eastbound, WB-westbound, L-left turn, T-through, R-right turn
Source: BTC, 2021

5.2.2 DAILY ROADWAY SEGMENT OPERATION

Cumulative No Project and Cumulative Plus Project average daily traffic volume and LOS on Monte Vista Avenue between Waring Road and Project Driveway and Project Driveway and Lester Road are presented in **Table 5-3**. The roadway would operate at LOS A as a four-lane roadway (two lanes in each direction) under Cumulative No Project and Cumulative Plus Project conditions.

Table 5-3: Monte Vista Avenue ADT and LOS Under Cumulative No Project and Plus Project Conditions

Segment	Cumulative No Project		Cumulative Plus Project	
	Daily Traffic[1]	LOS	Daily Traffic[1]	LOS
1. Monte Vista Avenue between Waring Road and Project Driveway	9,200	A	9,600	A
2. Monte Vista Avenue between Project Driveway and Lester Road	9,200	A	9,500	A

Notes:
1. Average daily two-way traffic.
Source: BTC, 2021.

6.0 VEHICLE MILES OF TRAVEL (VMT) EVALUATION

As part of the traffic evaluation a detailed VMT analysis was performed because the Project was seeking a General Plan Amendment based on the change in the approved land use of the Denair Community Plan. The following VMT analysis was completed to determine how the proposed Monte Vista Collection Subdivision Project would compare to the rest of the single-family households in the census-designated place (CDP) of Denair, California.

6.1 SENATE BILL (SB 743) AND VMT

Senate Bill (SB) 743 was signed into law in 2013 and is leading to substantial changes in the way transportation impact analyses are being prepared. Notably, it precludes the use of level of service (LOS) to identify significant transportation impacts in CEQA documents for land use projects, recommending instead that VMT be used as the preferred metric. On December 28, 2018, the CEQA Guidelines were amended to add Section 15064.3, Determining the Significance of Transportation Impacts, which states that generally, VMT is the most appropriate measure of transportation impacts. According to 15064.3(a), "Except as provided in subdivision (b)(2) (regarding roadway capacity), a project's effect on automobile delay shall not constitute a significant environmental impact." Beginning on July 1, 2020, the provisions of 15064.3 applied statewide.

To aid in SB 743 implementation, in December 2018, the Governor's Office of Planning and Research (OPR) released a Technical Advisory on Evaluating Transportation Impacts in CEQA (Technical Advisory). The Technical Advisory provides advice and recommendations to CEQA lead agencies on how to implement the SB 743 changes. This includes technical recommendations regarding the assessment of VMT, thresholds of significance, VMT mitigation measures, and screening thresholds for certain land use projects. Lead agencies may consider and use these recommendations at their discretion and with the provision of substantial evidence to support alternative approaches.

The Technical Advisory identifies "screening thresholds" to identify when a proposed project should be expected to cause a less-than-significant impact without conducting a detailed study. The Technical Advisory suggests that projects meeting one or more of the following criteria should be expected to have a less-than-significant impact on VMT.

- Small projects – projects consistent with a Sustainable Communities Strategy and local general plan that generate or attract fewer than 110 trips per day.

- Projects near major transit stops – certain projects (residential, retail, office, or a mix of these uses) proposed within ½ mile of an existing major transit stop or an existing stop along a high-quality transit corridor.
- Affordable residential development – a project consisting of a high percentage of affordable housing may be a basis to find a less-than-significant impact on VMT.
- Local-serving retail – local-serving retail development tends to shorten trips and reduce VMT. The Technical Advisory encourages lead agencies to decide when a project will likely be local-serving, but generally acknowledges that retail development including stores larger than 50,000 square feet might be considered regional-serving. The Technical Advisory suggests lead agencies analyze whether regional-serving retail would increase or decrease VMT (i.e., not presume a less-than-significant).
- Projects in low VMT areas – residential and office projects that incorporate similar features (i.e., density, mix of uses, transit accessibility) as existing development in areas with low VMT will tend to exhibit similarly low VMT.

The Technical Advisory also identifies recommended numeric VMT thresholds for residential, office, and retail projects. The residential threshold is described below.

- Residential development that would generate vehicle travel exceeding 15 percent below existing (baseline) residential VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as a regional VMT per capita or as city VMT per capita.

6.2 VMT SCREENING

The proposed Monte Vista Collection Subdivision Project was evaluated against the screening criteria in OPR's Technical Advisory. The following criteria is applicable to residential developments.

- Small projects – projects consistent with a Sustainable Communities Strategy and local general plan that generate or attract fewer than 110 trips per day.
- Projects near major transit stops – certain projects (residential, retail, office, or a mix of these uses) proposed within ½ mile of an existing major transit stop or an existing stop along a high-quality transit corridor.
- Affordable residential development – a project consisting of a high percentage of affordable housing may be a basis to find a less-than-significant impact on VMT.
- Projects in low VMT areas – residential and office projects that incorporate similar features (i.e., density, mix of uses, transit accessibility) as existing development in areas with low VMT will tend to exhibit similarly low VMT.

The proposed Monte Vista Collection Subdivision Project is not eligible to be screened out based on the following criteria:

- Does not constitute a small project because it is projected to generate 632 trips per day (Table 3-1);
- Is not located within ½ mile of an existing major transit stop (StanRTA provides Dial-A-Ride, and the Turlock-Denair Amtrak Station is located approximately one mile to the north-east); and
- Does not include a high percentage of affordable housing units.

It should also be noted that Stanislaus County has not developed low VMT areas; therefore, this criterion is not applicable at this time.

6.3 VMT ANALYSIS

The first step in the VMT analysis incorporated the use of the Three County Travel Demand Forecasting Model (TDF Model) developed for Stanislaus County to develop baseline (2019) VMT per single family residential household in the census-designated place (CDP) of Denair, California. Baseline represents 2019/2020 Pre-COVID Average Daily Traffic conditions, and the VMT was calculated by taking the total VMT generated by all single-family residential households in Denair, CA and dividing it by the total number of single-family residential households in Denair, CA.

Table 6-1 shows that the baseline VMT per single family household in Denair, CA was determined to be 197.3 vehicle miles. This is based on an average trip length of 20.9 miles per trip and an average daily trip generation of 9.44 vehicle trips per single family dwelling unit (20.9 x 9.44 = 197.3).

Table 6-1: Denair, CA Vehicle Miles Traveled Analysis

Baseline (2019/2020) Denair VMT Per Single Family Dwelling Unit	Cumulative (2045) Denair VMT Per Single Family Dwelling Unit	VMT Reduction Per Single Family Dwelling Unit	Percentage VMT Reduction Per Single Family Dwelling Unit
197.3	196.4	-0.9	-0.5%

Notes:
Source: Three County Model – Stanislaus County – Fehr & Peers, 2021.

For comparison, a StreetLight Data analysis was completed for the Census Tract bounded by E. Monte Vista to the north, E. Tuolumne Road to the south, N. Waring Road to the west and N. Gratton Road to the west. This polygon was used to estimate the average trip length of all vehicle trips either starting or ending in the predominately residential area located directly south-east of the proposed Monte Vista Collection Subdivision Project. The results of the StreetLight Data Origin-Destination analysis for weekday

2019 (Pre-COVID) conditions showed an average trip length of 17.9 miles per vehicle trip. When compared to the results obtained from the TDF Model, the StreetLight Data result was reasonable and within 14.5% (17.9 compared to 20.9) of the TDF Model.

In both the TDF Model and StreetLight Data analysis, less than 10% of the vehicle trips stay within Denair. The majority of trips (80%) travel to and from the west (towards Turlock and State Route 99), with 8% using Santa Fe Avenue to travel to and from the north towards Modesto, and the remaining 2% using Santa Fe Avenue to travel to and from the south towards Delhi / Atwater.

The second step in the VMT analysis also used the TDF Model for Stanislaus County to determine Cumulative (2045) VMT per single family residential household in Denair, California that includes full buildout of Denair, including the proposed Monte Vista Collection Subdivision Project. The estimated Cumulative (2045) VMT per single family household was determined to be 196.4 miles per household. This is based on an average trip length of 20.8 miles per trip and an average daily trip generation of 9.44 vehicle trips per single family dwelling unit (20.8 x 9.44 = 196.4).

6.4 VMT ANALYSIS CONCLUSIONS

The results of the VMT analysis showed a reduction (-0.9 mile or -0.5%) when comparing Cumulative with built out of Denair, including the proposed Monte Vista Collection Subdivision Project to Baseline Conditions (196.4 versus 197.3). It should be noted that based on the location of the proposed Monte Vista Collection Subdivision Project, near the west side of Denair, CA, and the majority of trips (80%) traveling to and from the west (towardsTurlock and State Route 99), it is anticipated that the average trip length for Monte Vista Collection Subdivision Project vehicle trips would be slightly lower than baseline (2019/2020) value of 20.9 miles, with an estimated average trip length of 20.1 miles (a reduction of 0.8 miles or -3.8%).

With 69 single family households located within 0.7 miles of Lester Road and Denair Elementary, Middle, and High School the ability of parents / students to walk to and from school has the additional potential to reduce two (2) vehicle trips per day. For households having school-aged children, the estimated Cumulative (2045) VMT per single family household for these households would be about 7.4% lower (175.6 compared to 189.7).

Therefore, the overall conclusions of the VMT analysis for the proposed Monte Vista Collection Subdivision Project are:

- The location of the proposed Monte Vista Collection Subdivision Project, near the west side of

Denair, CA, would result in an average trip length per household that is slightly lower than baseline (2019/2020) value of 20.9 miles, with an estimated average trip length of 20.1 miles (a reduction of 0.8 miles or -3.8%).

- With the proposed Monte Vista Collection Subdivision Project located within 0.7 miles of Lester Road and Denair Elementary, Middle, and High School the ability of parents / students to walk to and from school has the additional potential to reduce reliance on driving. For households having school-aged children, the estimated Cumulative (2045) VMT per single family household for these households would be about -7.4% lower (175.6 compared to 189.7).
- When comparing Cumulative with Build-out of Denair (with the proposed Monte Vista Collection Subdivision Project) to Baseline Conditions total VMT per household will decrease from 196.4 versus 197.3, a reduction of 0.9 miles or -0.5%; and
- Based on the detailed VMT analysis, the proposed Monte Vista Collection Subdivision Project would reduce average trip lengths, reduce total VMT per household, improve the health of residents and reduce greenhouse gas emissions in the census-designated place (CDP) of Denair, California.
- ***Based on current Stanislaus County guidance, the Project would have a less than significant VMT impact because the analysis resulted in a net-reduction of VMT.***

7.0 SITE PLAN REVIEW

This chapter analyzes site access and internal circulation for vehicles, pedestrians, bicycles, and emergency vehicles based on the tentative subdivision map presented previously on Appendix A. The proposed off-street parking was also reviewed.

7.1 VEHICULAR SITE ACCESS AND CIRCULATION

Access to the project site would be provided by a new roadway connection (Project Driveway) to Monte Vista Avenue. Based on the Stanislaus County General Plan the ultimate configuration of Monte Vista Avenue adjacent to the project site is a four-lane roadway with 110-foot right-of-way. The project proposes to widen Monte Vista Avenue on the north side to provide its equal share of right-of-way (55 feet as measured from the roadway center line). Monte Vista Avenue is a minor arterial; thus, it is recommended that a STOP (R1-1) sign be placed at the Project Driveway so that project traffic leaving the site would be required to stop and yield to through traffic on Monte Vista Avenue. According to the *Standards and Specifications 2014 Edition* (County Standards) prepared by the Stanislaus County Department of Public Works, a left-turn lane and taper may be required if the left-turn ingress volume (50 minimum) and the opposing volume per lane exceed 750 in any peak hour. The project traffic volumes do not meet these requirements. Nonetheless, the project will be providing a 100' left-turn lane with a 90' taper to provide some deceleration prior to the turn, as well as storage for vehicles that are stopped and waiting for the opportunity to complete the turn. This left-turn lane design would mirror what is provided at the Waring Road/Monte Vista Avenue intersection. As shown in previous chapters, the Project Driveway would operate at acceptable LOS A under Existing Plus Project and Cumulative Plus Project conditions.

> ***Recommendation:*** Provide a STOP (R1-1) sign at the Project Driveway so that project traffic leaving the site would be required to stop and yield to through traffic on Monte Vista Avenue.

The internal roadways would provide a 50-foot right-of-way with 32 feet of paved area that is sufficient for two travel lanes (one lane in each direction) and on-street parking on both sides of the roadway. The 50-foot right-of-way and two travel lanes is consistent with the engineering standards presented in the County Standards.

There are two internal "T" intersections that intersect at 90 degrees and provide adequate sight distance. According to the *California Manual on Uniform Traffic Control Devices* (CA MUTCD) the use of YIELD or STOP signs at an intersection should be used if on one or more of the following conditions exist:

- An intersection of a less important road with a main road where application of the normal right-of-way rule would not be expected to provide reasonable compliance with the law;
- A street entering a designated through highway or street; and/or
- An unsignalized intersection in a signalized area.

Based on the layout of the intersections it does not appear that any of these conditions exist. Therefore, it is recommended that neither YIELD nor STOP signs be provided at these intersections. Based on a review of the tentative subdivision map the project would provide adequate vehicle site access and circulation assuming the recommendation listed above is provided.

7.2 PEDESTRIAN ACCESS AND CIRCULATION

All of the internal roadways are proposed to have the same design and include a five-foot wide sidewalk on both sides of the roadway which is consistent with the County Standard. Along the project's frontage, 10-foot sidewalk would be provided to match the existing sidewalk width to the west. The project would also extend an off-site sidewalk (five-foot wide) from the project's southeast corner to the driveway near the southwest corner of the Denair High School Football Stadium. This would provide a complete sidewalk facility from the project to the Denair School District facilities (Denair Elementary, Middle, and High School). The project's proposed sidewalk improvements would eliminate the existing gap in the sidewalk system on the north side of Monte Vista Avenue between Waring Road and Lester Road. The project would provide adequate pedestrian access and circulation.

7.3 BICYCLE ACCESS AND CIRCULATION

The project does not propose to provide any dedicated bicycle facilities. Within the project site, dedicated bicycle facilities are not warranted given the low daily vehicle traffic volumes (less than 700 vehicles per day) and ample pavement width for vehicles and bicyclists to share the road. Along Monte Vista Avenue, there are no County plans to provide dedicated bicycle facilities. However, the project is widening Monte Vista Avenue on the north side that could accommodate a future Class II bicycle lane, if desired, in the future.

7.4 EMERGENCY VEHICLE ACCESS

Several factors determine whether a project has adequate access for emergency vehicles, including:

1. Number of access points (both public and emergency access only)
2. Width of internal roadways
3. Turnarounds at dead-end streets

Based on the County's Fire Code (adopted from the *2019 California Fire Code*), the minimum number of access roads serving a residential development shall be based upon the number of dwelling units served as follows:

- Development of one or two-family dwellings where the number of dwelling units exceed 30 shall be provided with two separate and approved fire apparatus access roads; where there are more than 30-dwelling units on a single public or private fire apparatus access road and all dwelling units are equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3 of the *California Fire Code*, access from two directions shall not be required.

The project (69 dwelling units) would only be served by a single access road; however, new single-family homes in California are required to have an automatic sprinkler system. Therefore, the project can have a single access road for emergency vehicles.

Cross-sections for the proposed streets within the project site were reviewed. All street sections provide a minimum of 20-feet of clearway (meaning no obstructions in terms of parked vehicles, landscaping, etc.), such that sufficient width is provided for emergency vehicle access and circulation.

There is one internal roadway (Street B) that dead-ends with no turnaround (i.e., no hammerhead or cul-de-sac) on the northern edge of the project site. A turnaround is not required based on the County's Fire Code because the dead-end street is below 150 feet in length.

7.5 PARKING

Two enclosed parking spaces for each residential unit would be provided. This is consistent with Stanislaus County Zoning Ordinance that requires two off-street parking spaces per single-family dwelling unit.

8.0 RECOMMENDATIONS AND SUMMARY OF FINDINGS

This chapter presents the recommendations and a summary of the findings of the transportation impact assessment.

8.1 RECOMMENDATIONS

The project is well designed and only one recommendation is provided to improve the project site layout.

> ***Recommendation:*** Provide a STOP (R1-1) sign at the Project Driveway so that project traffic leaving the site would be required to stop and yield to through traffic on Monte Vista Avenue.

8.2 SUMMARY OF FINDINGS

The key findings of this study are:

1) The project would not have a perceptible increase in traffic delay on the adjacent transportation facilities.
2) The project vehicle, pedestrian, and bicycle circulation are consistent with adopted Stanislaus County standards.
3) The project provides adequate vehicle and emergency vehicle access.
4) The project's proposed sidewalk improvements would eliminate the existing gap in the sidewalk system on the north side of Monte Vista Avenue between Waring Road and Lester Road. This would improve pedestrian circulation between the Monte Vista Collection Subdivision (and adjacent Hideaway Terrace neighborhood) to the Denair School District facilities (Denair Elementary, Middle, and High School).
5) When comparing Cumulative with Build-out of Denair (with the proposed Monte Vista Collection Subdivision Project) to Baseline Conditions total VMT per household will decrease from 196.4 versus 197.3, a reduction of 0.9 miles or -0.5%. Based on the detailed VMT analysis, the proposed Monte Vista Collection Subdivision Project would reduce average trip lengths, reduce total VMT per household, improve the health of residents and reduce greenhouse gas emissions in the census-designated place (CDP) of Denair, California. ***Based on current Stanislaus County guidance, the Project would have a less than significant VMT impact because the analysis resulted in a net-reduction of VMT.***

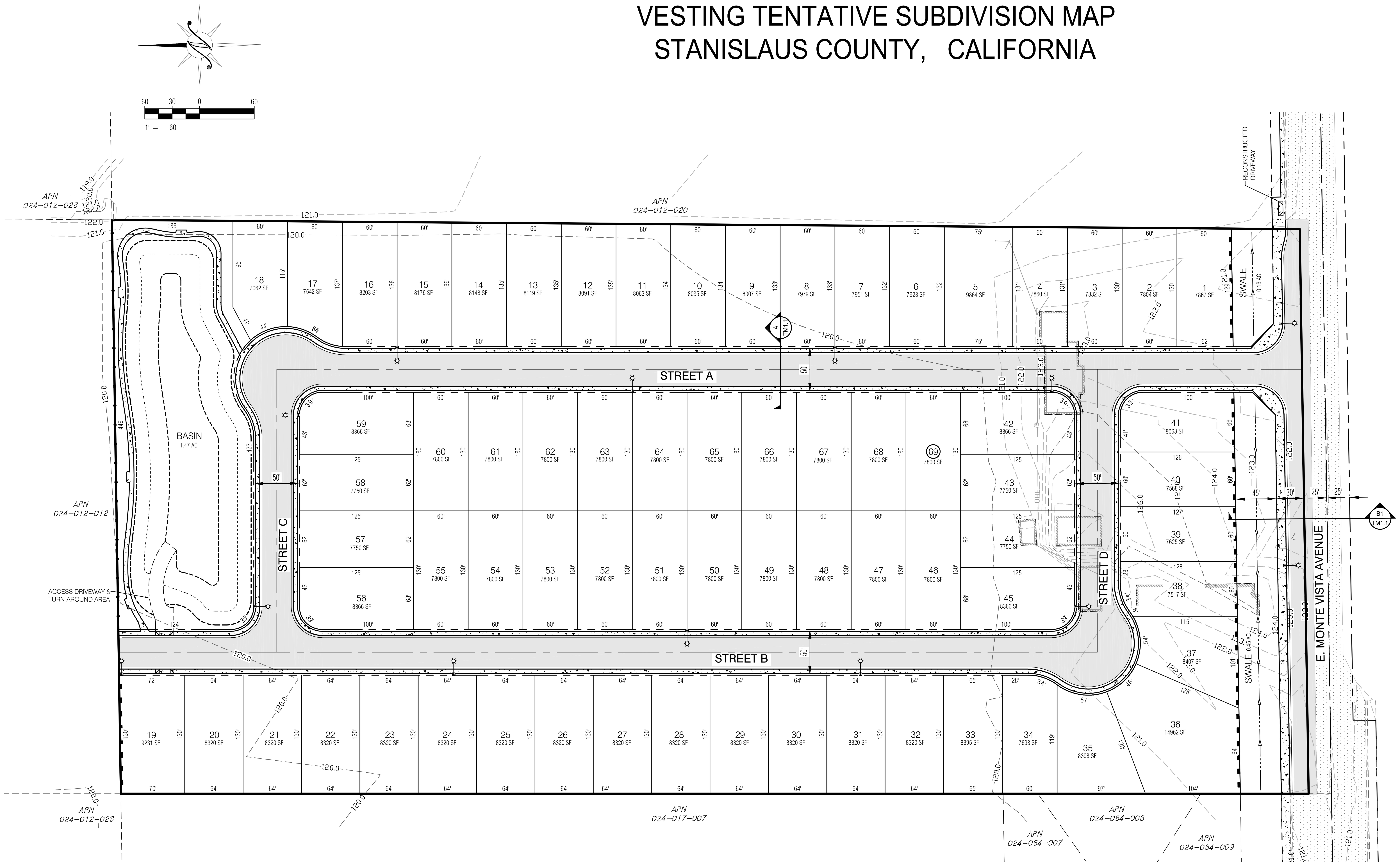
APPENDIX A

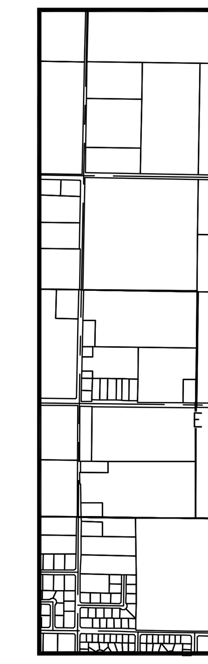
TENTATIVE SUBDIVISION MAP

MONTE VISTA COLLECTION SUBDIVISION

VESTING TENTATIVE SUBDIVISION MAP

STANISLAUS COUNTY, CALIFORNIA





VICINITY MAP

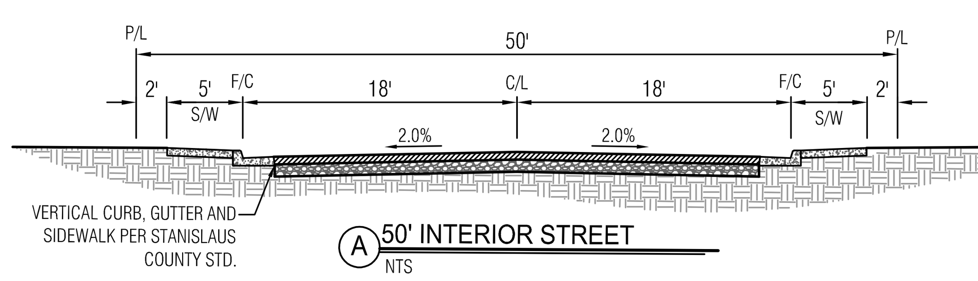
SHEET INDEX

PROJECT INFORMATION

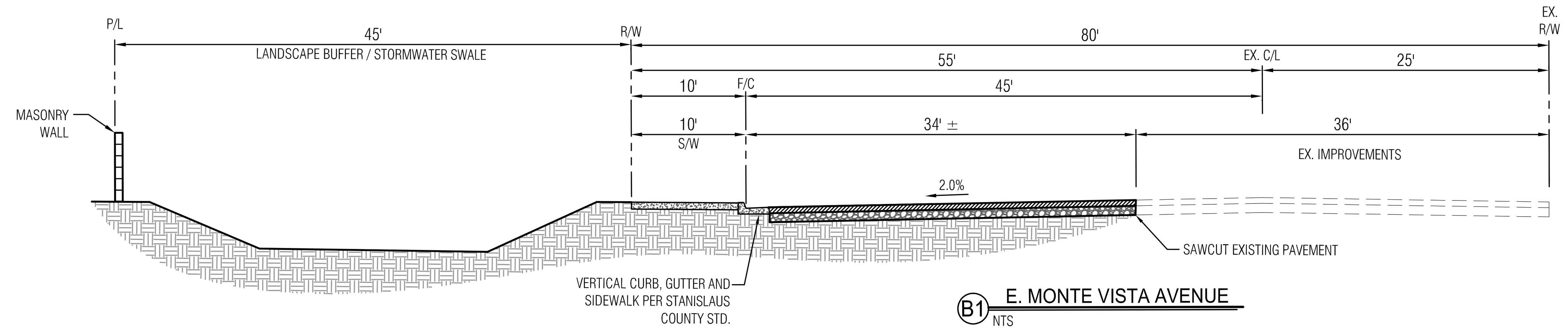
A. REGULATORY AGENCY:	STANISLAUS COUNTY 1010 10TH STREET, SUITE 3400 MODESTO, CA 95354 T: (209) 525-6557 CONTACT: JEREMY BALLARD
B. APPLICANT:	LAZARES COMPANIES 16795 LARK AVENUE, SUITE 106 LOS GATOS, CA. 95032 T: (209) 662-5098 CONTACT: TREVOR SMITH
C. ENGINEER:	NORTHSTAR ENGINEERING GROUP, INC 620 12th STREET MODESTO CA, 95354 T: (209) 524-3525 CONTACT: PAMELA HURBAN
D. ASSESSOR'S PARCEL NUMBER:	024-012-09
E. EXISTING LAND USE:	AGRICULTURE
F. PROPOSED LAND USE:	SINGLE FAMILY HOMES
G. EXISTING ZONING/GP:	LOW-DENSITY RESIDENTIAL (COUNTY GP) RESIDENTIAL-ESTATE (DENAIR CP)/ R-A
H. PROPOSED ZONING/GP:	PLANNED DEVELOPMENT/ R-1
I. TOTAL PROJECT SIZE:	18.6± ACRES
J. NET ACREAGE:	15.9± ACRES
K. TOTAL NUMBER OF R-1 LOTS:	69
L. NET DENSITY:	4.4 DU/AC
M. TYPICAL LOT SIZE:	60 X 130'
N. MAXIMUM FOOTPRINT COVERAGE:	40%
O. PARKING:	MINIMUM TWO CAR GARAGE, AND TWO DRIVEWAY SPACES PER LOT
P. CONTOURS:	1.0-FOOT INTERVALS
Q. UTILITIES:	WATER SYSTEM - DENAIR COMMUNITY SERVICE DISTRICT SANITARY SEWER - DENAIR COMMUNITY SERVICE DISTRICT STORM DRAINAGE - PRIVATE RETENTION SYSTEM GAS - PG&E ELECTRIC - TID TELEPHONE - AT&T SCHOOL DISTRICT - DENAIR UNIFIED SCHOOL DISTRICT

GENERAL NOTES

1. ALL IMPROVEMENTS SHALL BE CONSTRUCTED AS PER THE STANISLAUS COUNTY STANDARD PLANS AND SPECIFICATIONS EXCEPT AS NOTED.
2. STORM DRAINAGE TO BE CONVEYED TO A ON-SITE STORM DRAIN RETENTION BASIN. ALL IMPROVEMENTS TO BE CONSTRUCTED TO THE STANISLAUS COUNTY STANDARDS.
3. ALL STORM DRAINAGE IMPROVEMENTS AS PART OF FUTURE IMPROVEMENTS PLANS AND STUDIES SHALL CONFORM TO THE REQUIREMENTS SET FORTH IN NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT 2013-0001-DWQ AND THE MULTI-AGENCY POST-CONSTRUCTION STORMWATER STANDARDS MANUAL APPROVED OR ADOPTED PRIOR TO THE TIME OF THIS TENTATIVE MAP APPLICATION BEING DEEMED COMPLETE.
4. SANITARY SEWER TO BE CONSTRUCTED TO THE DENAIR COMMUNITY SERVICE DISTRICT STANDARDS AND SPECIFICATIONS.
5. WATER SYSTEM TO BE CONSTRUCTED TO THE DENAIR COMMUNITY SERVICE DISTRICT STANDARDS AND SPECIFICATIONS.
6. STREET LIGHTING SHALL BE INSTALLED PER STANISLAUS COUNTY STANDARD SPECIFICATIONS.
7. PUBLIC UTILITIES ARE TO BE INSTALLED UNDER GROUND IN EASEMENTS.
8. THE SUBDIVIDER HEREBY RESERVES THE RIGHT TO FILE "MULTIPLE SUBDIVISION MAPS" AS SET FORTH BY THE SUBDIVISION MAP ACT, ARTICLE 4, SECTION 66456.1., AND FILE PARCEL MAPS FOR REASON OF SALE. ALL PARCEL LINES SHALL CONFORM TO THIS TENTATIVE MAP.
9. PUBLIC UTILITY EASEMENTS WILL BE PROVIDED ALONG ALL STREET IN-TRACT FRONTAGES.
10. ALL EXISTING STRUCTURES AND TREES ARE TO BE REMOVED UNLESS OTHERWISE NOTED. ALL EXISTING POWER POLES AND OVERHEAD POWERLINES TO BE REMOVED/ UNDERGROUNDED.
11. ALL LOT SETBACK REQUIREMENTS AND LOT SIZES ARE TO BE IN ACCORDANCE WITH THE DENAIR COMMUNITY PLAN.



A 50' INTERIOR STREET
NTS



B1 E. MONTE VISTA AVENUE
NTS

LEGAL DESCRIPTION

THE LAND DESCRIBED HEREIN IS SITUATED IN THE STATE OF CALIFORNIA, COUNTY OF STANISLAUS UNINCORPORATED AREA AND DESCRIBED AS FOLLOWS: THE EAST ONE-HALF OF LOT 27 OF THE ELMWOOD COLONY, ACCORDING TO THE OFFICIAL MAP THEREOF, FILES IN THE OFFICE OF THE RECORDER OF STANISLAUS COUNTY, CALIFORNIA, ON APRIL 11, 1905 IN VOLUME 2 OF MAPS, AND PAGE 13.

CALL BEFORE YOU DIG 800-227-2600

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTIONS	DATE	APPROVED
	REVISIONS		

VESTING TENTATIVE SUBDIVISION MAP AND CROSS SECTIONS

MONTE VISTA COLLECTION SUBDIVISION

STANISLAUS COUNTY, CALIFORNIA

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

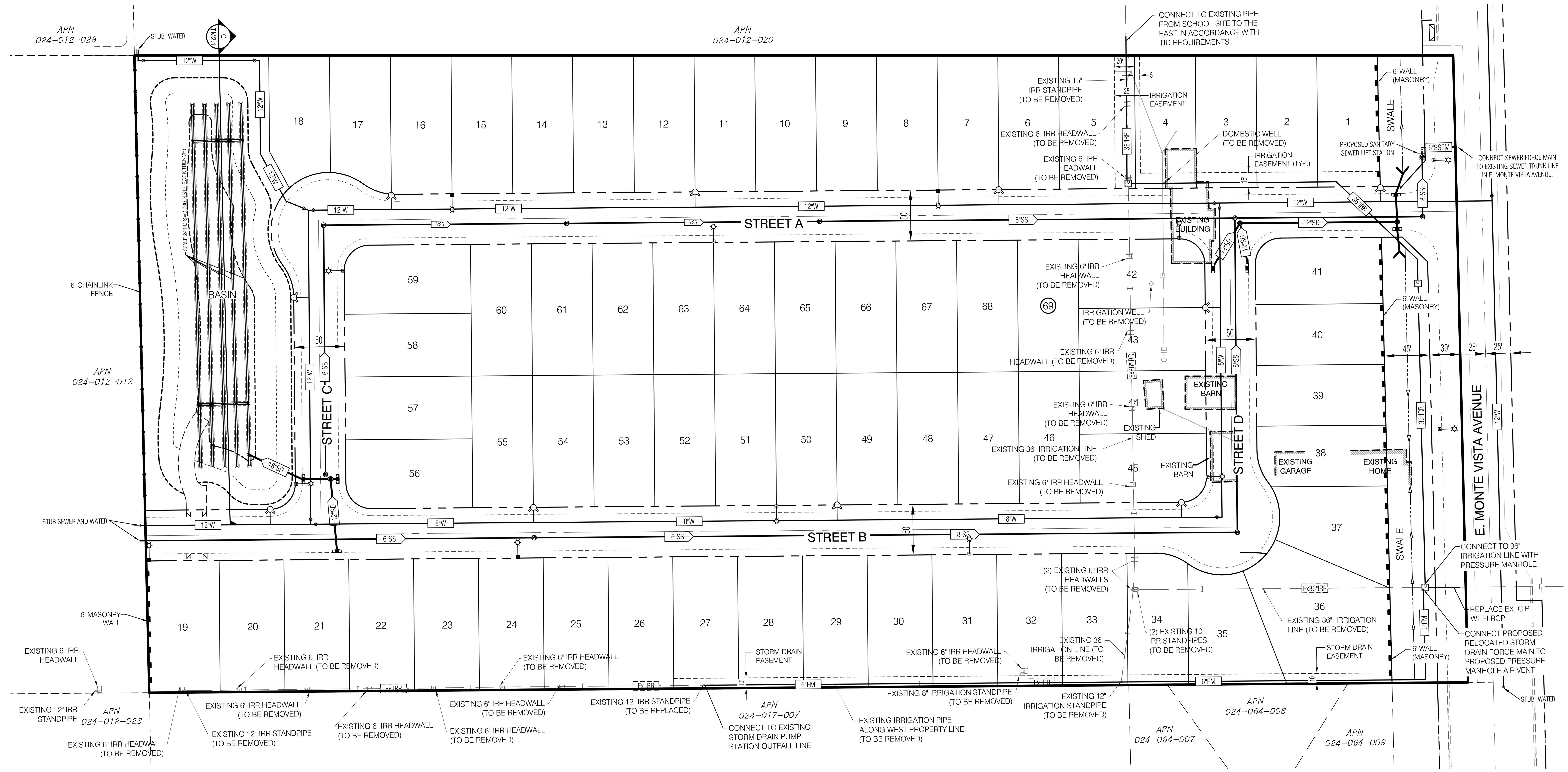
JOB #:	20-2759
DATE:	05/17/2022
SCALE:	AS SHOWN
DRAWN:	DR
DESIGN:	PMH/KM
CHK'D:	TPD

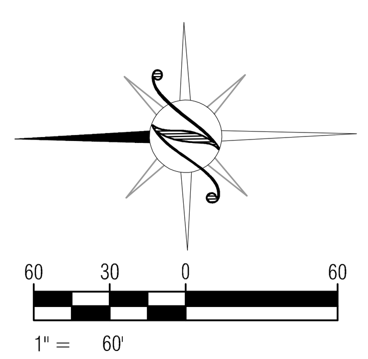
SHEET NUMBER

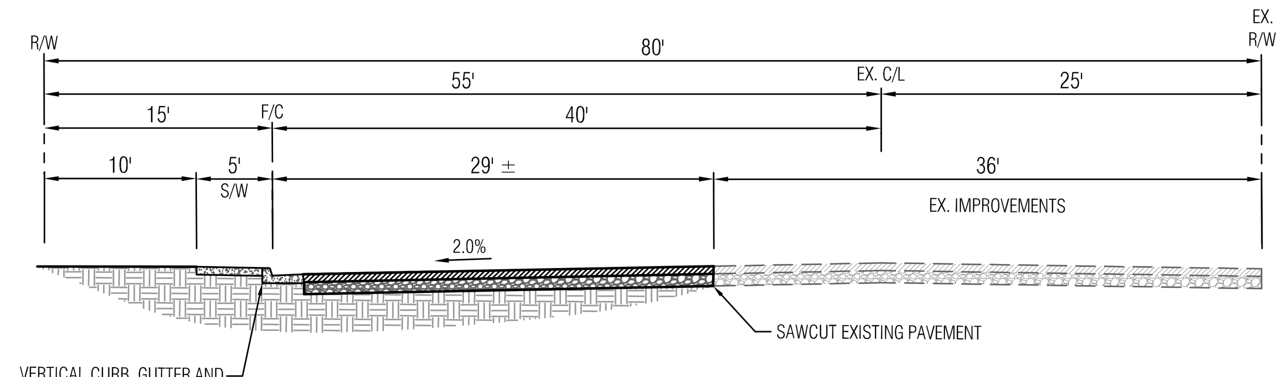
TM1.1

LEGEND

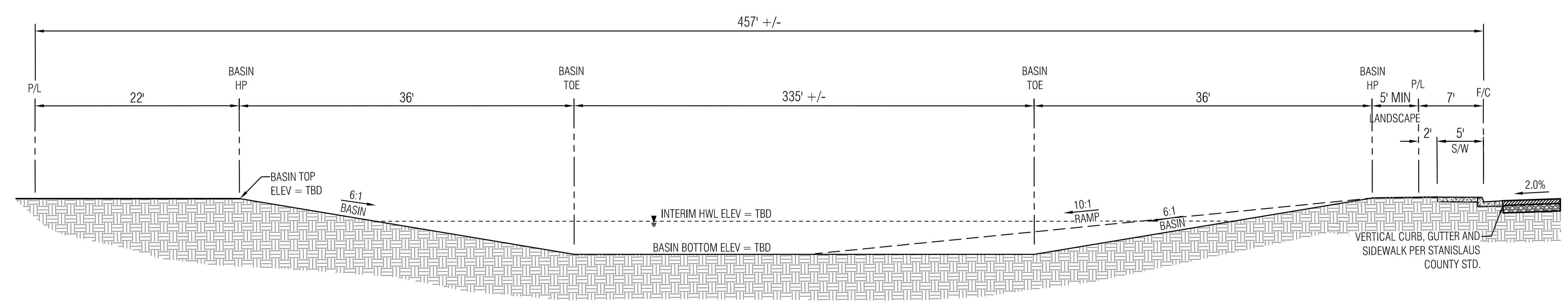
	EXISTING	PROPOSED
BOUNDARY LINE	N/A	
CENTERLINE		
RIGHT-OF-WAY		
PARCEL LINE		
CURB, GUTTER, AND SIDEWALK		
EDGE OF PAVEMENT		
DIRT ROAD		N/A
OVER HEAD ELECTRICAL	OHE	N/A
GAS LINE	G	N/A
CONTOURS	32	32
WALL (SEE LABEL FOR TYPE)		
FENCE (CHAINLINK OR VINYL)		
FENCE (WIRE OR HOGWIRE)		
FENCE (WOOD OR WROUGHT IRON)		
BARRICADE		
TREE OR SHRUB/TO BE REMOVED		N/A
SIGN		
SERVICE POLE		N/A
FLOW LINE		
STORM DRAIN (MAIN)	SD Ex12"SD	12"SD
STORM DRAIN MAINTENANCE HOLE		
CURB INLET		
STORM PUMP STATION	N/A	
STORM DRAIN OUTLET	N/A	
WATER (MAIN)	W Ex8"W	8"W
WATER VALVE	WV	WV
FIRE HYDRANT	N/A	
SEWER MAINTENANCE HOLE		
SEWER (MAIN)	SS Ex12"SS	12"SS
IRRIGATION MAIN	I Ex IRR	36"IRR
IRRIGATION MANHOLE	N/A	
IRRIGATION STRUCTURE		N/A



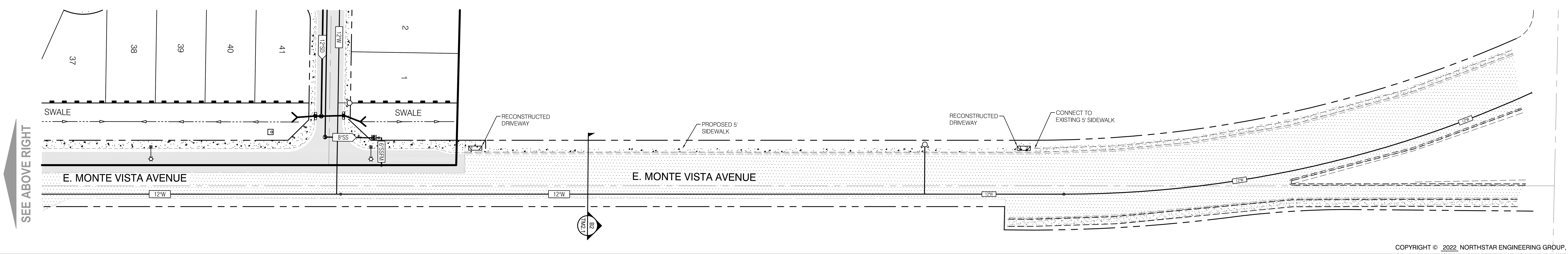




B2 E. MONTE VISTA AVENUE
NTS



C RETENTION BASIN CROSS SECTION
NTS



CALL BEFORE YOU DIG 800-227-2600

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTIONS	DATE	APPROVED
REVISIONS			

TENTATIVE SUBDIVISION MAP DETAILS

MONTE VISTA COLLECTION SUBDIVISION

STANISLAUS COUNTY, CALIFORNIA

NorthStar Engineering Group, Inc.
CIVIL ENGINEERING • SURVEYING • PLANNING
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

JOB #:	20-2759
DATE:	05/17/2022
SCALE:	AS SHOWN
DRAWN:	DR
DESIGN:	PMH/KM
CHKD:	TPD

SHEET NUMBER

TM2.1

APPENDIX B

LOS CRITERIA

Signalized Intersections

Traffic conditions at signalized intersections were evaluated using methods developed by the Transportation Research Board (TRB), as documented in the *Highway Capacity Manual 6th Edition* (2016 HCM) for vehicles using the analysis software Synchro 11.0. The HCM method calculates control delay at an intersection based on inputs such as traffic volumes, lane geometry, signal phasing and timing, pedestrian crossing times, and peak hour factors. Control delay is defined as the delay directly associated with the traffic control device (i.e., a traffic signal or stop sign) and specifically includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The relationship between LOS and control delay for signalized intersections is summarized in **Table A.**

Table A: Signalized Intersection LOS Criteria

Level of Service	Description	Delay in Seconds
A	Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	< 10.0
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10.0 to 20.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20.0 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35.0 to 55.0
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	This level is considered unacceptable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.	> 80.0

Source: 2016 *Highway Capacity Manual*

Unsignalized Intersections

For unsignalized (all-way stop controlled and side-street stop controlled) intersections, the HCM 6th Edition method for unsignalized intersections was used. With this method, operations are defined by the average control delay per vehicle (measured in seconds). The control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in queue. **Table B** summarizes the relationship between LOS and delay for unsignalized intersections. At side-street stop-controlled intersections, the delay is calculated for each stop-controlled movement. The highest movement/approach delay are reported for side-street stop-controlled intersections.

Table B: Unsignalized Intersection LOS Criteria

Level of Service	Description	Delay in Seconds
A	Little or no delays	≤ 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic, delays where intersection capacity exceeded	> 50.0

Source: 2016 *Highway Capacity Manual*

Roadway Segments

The roadway segment analysis for Monte Vista Avenue between Waring Road and Lester Road was based on the average daily traffic (ADT) volume, functional classification of the roadway (minor arterial) and the LOS thresholds presented in the Stanislaus County General Plan (Table II-1). **Table C** summarizes the roadway segment LOS criteria.

Table C: Roadway Segment LOS Criteria

Street Classification	LOS Thresholds (vehicles / per day / per lane)				
	A	B	C	D	E
Rural Minor Arterial	3,000	5,000	7,000	8,400	10,000

Source: *Stanislaus County General Plan*

APPENDIX C

TRAFFIC COUNT COMPARISON

Traffic Count Comparison

Location	Direction	Period	YEAR OF DATA 2016	2017	2021	% Difference (2021 vs. Historical Count)	Adjusted 2021 Count
Main Street east of Lester	Eastbound	AM	164		192	17%	192
		PM	228		236	4%	236
	Westbound	AM	289		309	7%	309
		PM	197		189	-4%	***197***
Monte Vista east of Waring	Eastbound	AM		152	239	58%	239
		PM		246	383	56%	383
	Westbound	AM		214	372	74%	372
		PM		246	306	24%	306
	Both	Daily		6818	8006	17%	8006
Monte Vista west of Waring	Eastbound	AM		145	236	63%	236
		PM		285	380	33%	380
	Westbound	AM		211	379	80%	379
		PM		242	309	28%	309
Average AM % Difference						50%	
Average PM % Difference						23%	
Average Daily % Difference						17%	

Adjusted Count: Assume volume is at least equal to a historical traffic count.

APPENDIX D

EXISTING CONDITIONS ANALYSIS WORKSHEETS

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.0	0.1	0.1	0.1
Total Del/Veh (s)	1.6	0.5	5.3	4.4	1.1
Vehicles Entered	232	396	6	28	662
Vehicles Exited	233	396	6	28	663
Hourly Exit Rate	233	396	6	28	663
Input Volume	236	394	5	27	662
% of Volume	99	101	114	105	100

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	1.1	0.0	0.2	0.4
Total Del/Veh (s)	25.4	23.4	19.0	30.0	23.3
Vehicles Entered	127	308	278	136	849
Vehicles Exited	126	309	279	135	849
Hourly Exit Rate	126	309	279	135	849
Input Volume	128	310	274	135	848
% of Volume	98	100	102	100	100

3: Lester Rd & Monte Vista Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.2	0.0	0.1
Total Del/Veh (s)	5.9	54.1	33.2	1.3	27.5
Vehicles Entered	113	143	169	89	514
Vehicles Exited	113	143	169	89	514
Hourly Exit Rate	113	143	169	89	514
Input Volume	112	141	168	88	508
% of Volume	101	101	101	101	101

10: Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.2	2.2	1.4
Vehicles Entered	253	375	628
Vehicles Exited	253	375	628
Hourly Exit Rate	253	375	628
Input Volume	253	372	625
% of Volume	100	101	100

Total Network Performance

Denied Del/Veh (s)	0.5
Total Del/Veh (s)	33.8
Vehicles Entered	1062
Vehicles Exited	1061
Hourly Exit Rate	1061
Input Volume	4277
% of Volume	25

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	WB	NB	SB
Directions Served	L	T	LTR	LTR
Maximum Queue (ft)	23	3	31	36
Average Queue (ft)	1	0	5	13
95th Queue (ft)	11	4	23	30
Link Distance (ft)		1053	706	1119
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	68	127	134	268	148	71	56	168
Average Queue (ft)	20	47	24	98	37	62	27	66
95th Queue (ft)	52	96	80	203	95	79	65	135
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						35	1	
Queuing Penalty (veh)						104	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)		0	0	8	0	53	1	
Queuing Penalty (veh)		0	0	12	0	29	2	

Intersection: 3: Lester Rd & Monte Vista Ave

Movement	EB	WB	NB
Directions Served	LTR	LTR	TR
Maximum Queue (ft)	72	297	258
Average Queue (ft)	40	100	82
95th Queue (ft)	64	271	215
Link Distance (ft)	432	1040	1166
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10:

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 147

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.0	0.1	0.1	0.2
Total Del/Veh (s)	1.8	0.5	5.0	4.9	1.4
Vehicles Entered	379	311	8	26	724
Vehicles Exited	379	312	8	25	724
Hourly Exit Rate	379	312	8	25	724
Input Volume	380	310	9	25	724
% of Volume	100	101	89	100	100

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.8	0.0	0.1	0.3
Total Del/Veh (s)	17.7	15.8	14.5	22.2	16.7
Vehicles Entered	176	198	215	89	678
Vehicles Exited	176	199	216	89	680
Hourly Exit Rate	176	199	216	89	680
Input Volume	176	196	214	87	674
% of Volume	100	101	101	102	101

3: Lester Rd & Monte Vista Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.2	0.0	0.1
Total Del/Veh (s)	5.8	7.4	5.6	1.3	5.6
Vehicles Entered	207	123	132	61	523
Vehicles Exited	208	123	132	61	524
Hourly Exit Rate	208	123	132	61	524
Input Volume	207	118	134	60	519
% of Volume	100	104	99	101	101

10: Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	1.9	1.0
Vehicles Entered	387	307	694
Vehicles Exited	387	307	694
Hourly Exit Rate	387	307	694
Input Volume	388	306	695
% of Volume	100	100	100

Total Network Performance

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	17.3
Vehicles Entered	966
Vehicles Exited	968
Hourly Exit Rate	968
Input Volume	4251
% of Volume	23

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	WB	WB	WB	NB	SB
Directions Served	L	L	T	R	LTR	LTR
Maximum Queue (ft)	20	19	8	1	32	30
Average Queue (ft)	1	1	0	0	6	12
95th Queue (ft)	10	9	6	2	26	29
Link Distance (ft)			1053		706	1119
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100	100		550		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	39	147	60	147	36	69	56	93
Average Queue (ft)	9	64	11	55	13	54	28	35
95th Queue (ft)	28	122	37	110	36	81	64	74
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						13	0	
Queuing Penalty (veh)						27	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)		1		1		34	1	
Queuing Penalty (veh)		0		1		18	2	

Intersection: 3: Lester Rd & Monte Vista Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	TR	LT
Maximum Queue (ft)	86	100	98	1
Average Queue (ft)	50	45	28	0
95th Queue (ft)	74	77	73	2
Link Distance (ft)	432	1040	1166	56
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 10:

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 48

APPENDIX E

EXISTING PLUS PROJECT CONDITIONS ANALYSIS WORKSHEETS

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.0	0.1	0.1	0.1
Total Del/Veh (s)	0.4	0.5	5.0	4.0	0.6
Vehicles Entered	242	408	6	27	683
Vehicles Exited	242	408	6	27	683
Hourly Exit Rate	242	408	6	27	683
Input Volume	243	404	6	27	680
% of Volume	100	101	96	101	100

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	1.1	0.0	0.2	0.4
Total Del/Veh (s)	26.0	25.0	19.4	29.8	24.2
Vehicles Entered	140	312	276	140	868
Vehicles Exited	141	313	277	140	871
Hourly Exit Rate	141	313	277	140	871
Input Volume	139	310	276	138	863
% of Volume	101	101	101	101	101

3: Lester Rd & Monte Vista Ave Performance by approach (Low Project Volume-No Change)

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)					
Total Del/Veh (s)					
Vehicles Entered					
Vehicles Exited					
Hourly Exit Rate					
Input Volume					
% of Volume					

4: Monte Vista Ave & Project Dvwy Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.5	0.6	5.7	1.2
Vehicles Entered	251	393	41	685
Vehicles Exited	251	394	41	686
Hourly Exit Rate	251	394	41	686
Input Volume	253	390	37	680
% of Volume	99	101	110	101

10: Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.2	2.1	1.3
Vehicles Entered	263	382	645
Vehicles Exited	265	382	647
Hourly Exit Rate	265	382	647
Input Volume	263	377	640
% of Volume	101	101	101

Total Network Performance

Denied Del/Veh (s)	0.5
Total Del/Veh (s)	35.5
Vehicles Entered	1114
Vehicles Exited	1118
Hourly Exit Rate	1118
Input Volume	4448
% of Volume	25

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	WB	WB	NB	SB
Directions Served	L	L	T	LTR	LTR
Maximum Queue (ft)	24	9	2	29	32
Average Queue (ft)	2	0	0	5	12
95th Queue (ft)	13	6	3	23	29
Link Distance (ft)			1059	706	1119
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100	100			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	82	136	121	292	159	71	56	168
Average Queue (ft)	23	51	23	105	40	61	26	68
95th Queue (ft)	56	107	73	221	106	80	65	135
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						36	0	
Queuing Penalty (veh)						105	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)	0	1	0	11	0	53	1	
Queuing Penalty (veh)	0	0	0	15	0	30	2	

Intersection: 3: Lester Rd & Monte Vista Ave (Low Project Volume - No Change)

Movement	EB	WB	NB
Directions Served	LTR	LTR	TR
Maximum Queue (ft)			
Average Queue (ft)			
95th Queue (ft)			
Link Distance (ft)			
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Monte Vista Ave & Project Dvwy

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	22	60
Average Queue (ft)	2	26
95th Queue (ft)	13	53
Link Distance (ft)		314
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10:

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 153

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.0	0.1	0.1	0.2
Total Del/Veh (s)	1.9	0.5	5.9	5.1	1.5
Vehicles Entered	402	321	13	25	761
Vehicles Exited	403	320	13	25	761
Hourly Exit Rate	403	320	13	25	761
Input Volume	401	322	13	25	761
% of Volume	100	100	100	100	100

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.8	0.0	0.1	0.2
Total Del/Veh (s)	18.6	16.0	14.6	23.4	17.3
Vehicles Entered	188	196	217	99	700
Vehicles Exited	187	197	217	99	700
Hourly Exit Rate	187	197	217	99	700
Input Volume	184	201	218	96	698
% of Volume	102	98	100	103	100

3: Lester Rd & Monte Vista Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.2	0.0	0.1
Total Del/Veh (s)	5.8	7.5	6.1	1.4	5.8
Vehicles Entered	208	123	130	61	522
Vehicles Exited	209	123	131	61	524
Hourly Exit Rate	209	123	131	61	524
Input Volume	209	122	134	60	526
% of Volume	100	100	98	101	100

4: Monte Vista Ave & Project Driveway Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	0.5	0.3	5.2	0.6
Vehicles Entered	413	326	24	763
Vehicles Exited	414	326	24	764
Hourly Exit Rate	414	326	24	764
Input Volume	410	326	24	760
% of Volume	101	100	100	100

10: Monte Vista Ave Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	1.8	1.0
Vehicles Entered	399	323	722
Vehicles Exited	400	324	724
Hourly Exit Rate	400	324	724
Input Volume	396	324	720
% of Volume	101	100	101

Total Network Performance

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	17.6
Vehicles Entered	1025
Vehicles Exited	1027
Hourly Exit Rate	1027
Input Volume	4481
% of Volume	23

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (ft)	19	3	18	4	1	36	30
Average Queue (ft)	1	0	1	0	0	10	12
95th Queue (ft)	11	3	9	4	2	33	30
Link Distance (ft)		1847		1059		706	1119
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	100		100		550		
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	49	172	45	146	47	68	56	107
Average Queue (ft)	11	69	11	56	12	54	28	41
95th Queue (ft)	35	134	33	112	39	81	64	82
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						14	0	
Queuing Penalty (veh)						30	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)		1		2		35	1	
Queuing Penalty (veh)		0		1		18	1	

Intersection: 3: Lester Rd & Monte Vista Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	TR	LT
Maximum Queue (ft)	81	101	99	1
Average Queue (ft)	49	45	29	0
95th Queue (ft)	73	76	77	2
Link Distance (ft)	432	1040	1166	56
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Monte Vista Ave & Project Driveway

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	36	40
Average Queue (ft)	7	17
95th Queue (ft)	29	44
Link Distance (ft)		302
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: Monte Vista Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 50

APPENDIX F
CUMULATIVE NO PROJECT AND PLUS PROJECT ANALYSIS WORKSHEETS

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.1	0.1	0.1
Total Del/Veh (s)	1.4	0.4	4.8	5.0	1.0
Vehicles Entered	272	450	9	31	762
Vehicles Exited	272	450	9	30	761
Hourly Exit Rate	272	450	9	30	761
Input Volume	272	451	8	33	763
% of Volume	100	100	109	92	100

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	1.1	0.0	0.2	0.5
Total Del/Veh (s)	27.4	26.4	20.6	31.0	25.4
Vehicles Entered	144	363	316	156	979
Vehicles Exited	143	361	315	158	977
Hourly Exit Rate	143	361	315	158	977
Input Volume	147	354	315	155	971
% of Volume	97	102	100	102	101

3: Lester Rd & Monte Vista Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.2	0.0	0.1
Total Del/Veh (s)	6.2	130.5	92.2	1.2	67.8
Vehicles Entered	130	162	192	105	589
Vehicles Exited	130	162	194	105	591
Hourly Exit Rate	130	162	194	105	591
Input Volume	128	162	192	101	584
% of Volume	101	100	101	104	101

10: Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.1	2.2	1.3
Vehicles Entered	290	425	715
Vehicles Exited	291	426	717
Hourly Exit Rate	291	426	717
Input Volume	291	426	718
% of Volume	100	100	100

Total Network Performance

Denied Del/Veh (s)	0.5
Total Del/Veh (s)	54.0
Vehicles Entered	1227
Vehicles Exited	1229
Hourly Exit Rate	1229
Input Volume	4913
% of Volume	25

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	L	TR	LTR	LTR
Maximum Queue (ft)	22	4	1	4	7	30	44
Average Queue (ft)	3	0	0	0	0	7	19
95th Queue (ft)	16	4	2	3	6	27	43
Link Distance (ft)		1847	1847		1053	694	1121
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	100			100			
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	86	140	152	352	155	73	56	189
Average Queue (ft)	22	55	31	124	47	64	27	77
95th Queue (ft)	57	109	95	268	121	75	66	151
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						48	1	
Queuing Penalty (veh)						155	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)	0	1	0	13	0	62	1	
Queuing Penalty (veh)	0	0	0	21	0	39	4	

Intersection: 3: Lester Rd & Monte Vista Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	TR	LT
Maximum Queue (ft)	79	486	490	3
Average Queue (ft)	41	200	182	0
95th Queue (ft)	66	512	493	3
Link Distance (ft)	432	1040	1166	56
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 10:

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 219

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.1	0.1	0.1
Total Del/Veh (s)	1.5	0.3	5.9	5.7	1.2
Vehicles Entered	442	354	12	28	836
Vehicles Exited	442	353	12	28	835
Hourly Exit Rate	442	353	12	28	835
Input Volume	435	355	12	30	832
% of Volume	102	100	100	93	100

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.8	0.0	0.2	0.3
Total Del/Veh (s)	19.0	16.5	15.6	24.2	17.9
Vehicles Entered	204	230	243	101	778
Vehicles Exited	203	230	243	101	777
Hourly Exit Rate	203	230	243	101	777
Input Volume	202	225	245	100	773
% of Volume	100	102	99	100	101

3: Lester Rd & Monte Vista Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.2	0.0	0.1
Total Del/Veh (s)	6.3	9.8	7.4	1.4	6.8
Vehicles Entered	241	137	148	73	599
Vehicles Exited	241	137	147	73	598
Hourly Exit Rate	241	137	147	73	598
Input Volume	237	136	153	70	596
% of Volume	102	101	96	105	100

10: Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.1	1.9	0.9
Vehicles Entered	451	351	802
Vehicles Exited	451	351	802
Hourly Exit Rate	451	351	802
Input Volume	445	351	796
% of Volume	101	100	101

Total Network Performance

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	18.4
Vehicles Entered	1111
Vehicles Exited	1112
Hourly Exit Rate	1112
Input Volume	4879
% of Volume	23

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	22	4	3	18	7	6	31	42
Average Queue (ft)	1	0	0	1	0	0	10	19
95th Queue (ft)	11	4	4	8	6	4	32	43
Link Distance (ft)		1847	1847		1053	1053	694	1121
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			100				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	53	170	58	148	51	71	56	124
Average Queue (ft)	11	75	12	65	15	58	30	43
95th Queue (ft)	34	136	38	124	44	81	68	93
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						19	1	
Queuing Penalty (veh)						45	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)		2		2		41	1	
Queuing Penalty (veh)		0		1		24	2	

Intersection: 3: Lester Rd & Monte Vista Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	TR	LT
Maximum Queue (ft)	100	114	115	2
Average Queue (ft)	54	50	36	0
95th Queue (ft)	84	91	87	2
Link Distance (ft)	432	1040	1166	56
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 10:

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 74

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.0	0.1	0.1	0.1
Total Del/Veh (s)	0.4	0.6	4.8	4.8	0.7
Vehicles Entered	277	459	10	33	779
Vehicles Exited	277	458	10	33	778
Hourly Exit Rate	277	458	10	33	778
Input Volume	278	459	9	33	779
% of Volume	100	100	108	101	100

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	1.1	0.1	0.2	0.5
Total Del/Veh (s)	26.3	28.7	21.3	32.5	26.5
Vehicles Entered	158	352	318	156	984
Vehicles Exited	158	354	318	156	986
Hourly Exit Rate	158	354	318	156	986
Input Volume	158	355	316	158	988
% of Volume	100	100	101	98	100

3: Lester Rd & Monte Vista Ave Performance by approach (Low Project Volume - No Change)

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)					
Total Del/Veh (s)					
Vehicles Entered					
Vehicles Exited					
Hourly Exit Rate					
Input Volume					
% of Volume					

4: Monte Vista Ave & Project Dvwy Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.6	0.6	6.4	1.2
Vehicles Entered	290	447	34	771
Vehicles Exited	291	447	34	772
Hourly Exit Rate	291	447	34	772
Input Volume	290	446	37	772
% of Volume	101	100	91	100

10: Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.2	2.1	1.3
Vehicles Entered	298	433	731
Vehicles Exited	298	433	731
Hourly Exit Rate	298	433	731
Input Volume	300	432	732
% of Volume	99	100	100

Total Network Performance

Denied Del/Veh (s)	0.5
Total Del/Veh (s)	60.9
Vehicles Entered	1263
Vehicles Exited	1269
Hourly Exit Rate	1269
Input Volume	5086
% of Volume	25

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	T	LTR	LTR
Maximum Queue (ft)	24	4	20	4	33	36
Average Queue (ft)	2	0	1	0	8	14
95th Queue (ft)	14	5	9	4	30	32
Link Distance (ft)		1847		1059	706	1119
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100		100			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	97	148	145	370	160	73	56	194
Average Queue (ft)	27	57	29	130	50	64	27	79
95th Queue (ft)	65	114	94	284	131	74	67	159
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						51	1	
Queuing Penalty (veh)						163	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)	0	1	0	15	0	63	1	
Queuing Penalty (veh)	0	1	1	24	0	39	4	

Intersection: 3: Lester Rd & Monte Vista Ave (Low Project Volume - No Change)

Movement	EB	WB	NB	SB
Directions Served				
Maximum Queue (ft)				
Average Queue (ft)				
95th Queue (ft)				
Link Distance (ft)				
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Monte Vista Ave & Project Dvwy

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	26	53
Average Queue (ft)	2	23
95th Queue (ft)	15	51
Link Distance (ft)		314
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10:

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 232

1: Monte Vista Ave & Waring Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.1	0.1	0.1
Total Del/Veh (s)	1.5	0.4	4.8	5.9	1.3
Vehicles Entered	453	370	18	31	872
Vehicles Exited	454	370	18	31	873
Hourly Exit Rate	454	370	18	31	873
Input Volume	456	366	16	30	868
% of Volume	100	101	112	103	101

2: Main St & Lester Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.8	0.0	0.2	0.3
Total Del/Veh (s)	19.7	17.8	15.5	23.6	18.4
Vehicles Entered	208	229	251	110	798
Vehicles Exited	208	228	251	109	796
Hourly Exit Rate	208	228	251	109	796
Input Volume	210	229	249	110	798
% of Volume	99	99	101	100	100

3: Lester Rd & Monte Vista Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.2	0.0	0.1
Total Del/Veh (s)	6.3	10.8	8.4	1.3	7.3
Vehicles Entered	240	140	155	69	604
Vehicles Exited	240	141	156	69	606
Hourly Exit Rate	240	141	156	69	606
Input Volume	239	140	153	70	602
% of Volume	100	101	102	99	101

4: Monte Vista Ave & Project Driveway Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	0.4	0.2	5.1	0.4
Vehicles Entered	465	374	26	865
Vehicles Exited	465	374	26	865
Hourly Exit Rate	465	374	26	865
Input Volume	467	370	24	862
% of Volume	100	101	108	100

10: Monte Vista Ave Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.2	1.9	1.0
Vehicles Entered	452	370	822
Vehicles Exited	451	370	821
Hourly Exit Rate	451	370	821
Input Volume	452	367	819
% of Volume	100	101	100

Total Network Performance

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	18.8
Vehicles Entered	1177
Vehicles Exited	1176
Hourly Exit Rate	1176
Input Volume	5107
% of Volume	23

Intersection: 1: Monte Vista Ave & Waring Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	23	3	6	22	6	6	35	48
Average Queue (ft)	1	0	0	2	0	0	13	20
95th Queue (ft)	10	2	4	12	4	4	36	45
Link Distance (ft)		1847	1847		1059	1059	694	1121
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			100				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: Main St & Lester Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	R	LT	R	LTR
Maximum Queue (ft)	60	168	63	163	56	70	56	116
Average Queue (ft)	12	76	13	67	15	59	31	45
95th Queue (ft)	39	136	40	127	44	79	68	91
Link Distance (ft)		430		1807		56		1470
Upstream Blk Time (%)						19	1	
Queuing Penalty (veh)						48	0	
Storage Bay Dist (ft)	125		100		100		25	
Storage Blk Time (%)		2		3		42	1	
Queuing Penalty (veh)		0		2		25	2	

Intersection: 3: Lester Rd & Monte Vista Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	TR	LT
Maximum Queue (ft)	104	130	118	3
Average Queue (ft)	53	53	37	0
95th Queue (ft)	84	98	93	3
Link Distance (ft)	432	1040	1166	56
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Monte Vista Ave & Project Driveway

Movement	EB	WB	SB
Directions Served	L	TR	LR
Maximum Queue (ft)	36	2	44
Average Queue (ft)	7	0	18
95th Queue (ft)	30	2	44
Link Distance (ft)		659	290
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: Monte Vista Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 77

CSD

Denair Community
Service District

3850 N. Gratton Road
P.O. Box 217
Denair, California 95316

Phone: 209-634-4986
Fax: 209-634-9805

May 12, 2022

Stanislaus County
Planning & Community Development
1010 10th St.
Modesto CA 95354

Re:	Applicant's Name:	**Lazares Development, Inc.** **Dave Lazares, President** **Trevor Smith, Vice President**
	Project Name:	**Monte Vista Collection**
	Location:	**3531 E. Monte Vista Ave. / Denair CA / 95316**
	APN:	**024-012-009**

Valid Until: 5-12-2023

Dear Reader:

The Denair Community Services District can provide water and sewer services to the location noted above.

Before any project begins, approval must first be obtained from the appropriate departments(s) at Stanislaus County, in addition to verifying availability of services form the Denair Community Services District.

When the owner does choose to develop this parcel, they must enter into an Agreement with the Denair Community Services District to construct and pay for the necessary infrastructure to enable the District to provide water and sewer services to the project. The Agreement will require, among other things that the infrastructure be constructed to the District specifications, that security be given to the District to guarantee performance and payment for the infrastructure and that all current connections fees be paid in full. Once all fees are paid, a "Will Serve Letter" will be submitted to the applicant. The "Will Serve Letter" must be presented to the Stanislaus County Building Department before a Building Permit will be issued.

Any substantial revision to the Tentative Map during Stanislaus County processing may require additional conditions by Denair Community Services District.

A "Will Serve Letter" is required for all additions, remodels, and swimming pool construction.
This letter is valid until 5-12-2023, and pending Board review of the Public Facilities may be renewed.

Sincerely, David Odom

David Odom, General Manager
Denair Community Services District.

Via E-Mail

April 23, 2021
BGG Project No. G188.03

Trevor Smith
Lazares Companies
16795 Lark Avenue, Suite 106
Los Gatos, California 95032

Subject: Geotechnical Investigation
Monte Vista Collection Residential Subdivision
APN 024-012-009-000
3531 East Monte Vista Avenue
Denair, California

Dear Mr. Smith:

We have completed a geotechnical investigation for the design and construction of the proposed 69-lot, Monte Vista Collection residential subdivision. The subject 18.61-acre site is located on the north side of East Monte Vista Avenue, east of East Waring Road, in Denair, California (see Plate 1, Vicinity Map). It is our understanding that the proposed residential subdivision will include the construction of one-story and two-story, single-family residences, with a 1.5-acre stormwater basin in the northeast corner of the development and 0.6-acres of swale areas along the southern boundary adjacent to Monte Vista Avenue. We anticipate site walls will be constructed along the project boundaries, with portions near the base of the walls to be partially retaining walls. The residences will be supported on shallow foundations with interior floor slabs. The site is relatively flat; hence, minor grading is anticipated.

PURPOSE AND SCOPE OF SERVICES

The purpose of our investigation was to evaluate the subject site with respect to soil and groundwater conditions, and to provide geotechnical recommendations for the design and construction of the proposed improvements. The scope of our services included a review of available geologic literature covering the site, field exploration, field percolation testing, laboratory testing, engineering analyses, and preparation of this report.

FIELD EXPLORATION, PERCOLATION TESTING & LABORATORY TESTING

Our field exploration was conducted on April 8, 2021, which included excavating eight test pits to depths of up to 6-feet below the ground surface (bgs). We also performed field percolation testing in two test pits located in the areas of the proposed stormwater management improvements. The locations of the test pits and field percolation tests are shown on Plate 2, Site Plan. The test pits were excavated using a compact excavator and were loosely backfilled and track-walked upon completion. Materials encountered in the test pits were visually classified in the field and logs were recorded. Bulk soil samples and manually driven tube soil samples were obtained from the test pits for laboratory testing. The test pit logs are contained in Appendix A.

Field percolation testing was performed at depths of 3 to 6 feet bgs, at the bottom of TP2/P1 and in TP8/P2. Details of the test procedures and results obtained for the percolation testing are contained in Appendix B. A summary of the percolation rates recorded are provided in subsequent text of this report.

Laboratory testing was performed on selected soil samples obtained from our test pits, including consolidation/swell, R-Value, and corrosivity tests. The laboratory test results are summarized below and in the test pit logs, and are contained in Appendix B. An R-Value of 72 was obtained for a mixture of soil from the upper 3-feet from TP1, TP5, and TP8. Single-point consolidation/swell tests consisted of loading relatively undisturbed soil samples with a minor initial seating load, followed by an overburden pressure load, then recording the long-term consolidation under a surcharge load of 2,500 psf and again after saturation. The results of the consolidation/swell tests are summarized below.

LABORATORY TEST RESULTS

Location	Soil Type	Consolidation or Swell (1)	Consolidation or Swell (2)
TP1 at 2.5-3-ft	SM/SP, Silty Sand to Sand with Silt	-1.0%	-1.2%
TP7 at 2-2.5-ft	SM/SP, Silty Sand to Sand with Silt	-1.4%	-1.6%
TP6 at 3-3.5-ft	SM/SP, Silty Sand to Sand with Silt	-0.9%	-1.1%
TP3 at 3.5-4-ft (3)	SM/SP, Silty Sand to Sand with Silt	-1.6%	-3.3%

(1) Long-term consolidation or swell percent – surcharge load
(2) Additional long-term consolidation or swell – after saturation
(3) Sample was likely disturbed

A sample containing a mixture of soils from the upper two feet from TP1, TP2, TP5, TP7 and TP8 was submitted to CERCO Analytical, a state-certified analytical laboratory, in Concord, California. A suite of corrosion tests was performed on the sample, including Redox, pH, Resistivity, Sulfides, Chlorides, and Sulfates. The test results were not available at the time this report was issued; hence the results and a brief evaluation will be provided under separate cover, upon completion.

GEOTECHNICAL AND GEOLOGICAL FINDINGS

SITE DESCRIPTION

The site is relatively flat with surface elevations of about 120- to 125-feet above mean sea level (MSL) according to Google Earth mapping and data. The approximately 18.6-acre property is located on the north side of East Monte Vista Avenue between Waring Road to the west, Lester Road to the east, and Zeering Road to the north. The property currently contains two ranch residences and several outbuildings in the southern portion of the property. The remainder of the property is currently in use for orchard tree agriculture.

SUBSURFACE CONDITIONS

The USDA Web Soil Survey indicates that the site is underlain by the Hanford sandy loam soil series. The following summarizes the published data for the soils in the upper 5-feet bgs:

- 95 to 100 percent passing the No. 4 sieve (i.e. less than 5 percent gravel).

- 51 to 72 percent sand.
- 28 to 44 percent passing the No. 200 sieve (i.e. silt-sized and clay-sized soil particles).
- Liquid Limit between 18 and 31 and Plasticity Index between 3 and 12.
- Hydrologic Group A.
- Infiltration rate of 2 to 6 inches per hour.

The following is a general description of the soils observed in our test pit excavations. The soils encountered in the test pits consisted of alternating layers and lenses of silty sand and sand with silt, with occasional lenses of silt. The upper 2 to 3-feet was found to be loose to medium dense and the soils below this depth were predominantly medium dense with some minor dense layers. More detailed descriptions of the soils identified at the site are contained in the test pit logs in Appendix A.

FIELD PERCOLATION TESTING

The results of our field percolation tests are contained in Appendix B and a summary of the test results is presented below. The civil engineer should apply an appropriate factor-of-safety to the measured field percolation rates, for use in the design of stormwater management facilities.

Location	Depth (bgs)	Rate	Soil Type
P1/TP2	6-feet	5.33 inches/hour	Silty Sand to Sand with Silt
P2/TP8	3-feet	2.40 inches/hour	Silty Sand to Sand with Silt

GROUNDWATER

According to the California Water Data Library Groundwater Level Reports, two wells are located within ¼-mile from the site. Data from these nearby wells indicates that groundwater levels were historically about 10-feet deep, but within recent years are reported to be about 30 to 40-feet deep. Groundwater was not encountered in our test pits which were excavated up to a depth of 6-feet bgs. Numerous factors contribute to groundwater level fluctuations including precipitation, irrigation, and well pumping. A detailed evaluation of these and other factors, which may be responsible for groundwater fluctuations, was beyond the scope of this investigation.

RELEVANT GEOLOGIC HAZARDS

The site is located proximal to a seismically active region and will likely experience seismic shaking from large earthquakes. The site modified peak ground acceleration (PGA), according to the Structural Engineers Association of California (SEAOC) website, is 0.35g based on the 2019 California Building Code (CBC). The site is not located within a seismic hazard zone mapped for earthquake faults by the California Geological Survey. Hence, the likelihood for surface fault rupture to occur at the site is nil.

The potential for liquefaction induced settlement to impact the development at the site is low, due to the low site peak ground acceleration and the relatively dense subsurface soils. The potential for site impact from the settlement of dry sands above the water table is also low, due to the low site peak ground acceleration and relatively dense soils.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

We conclude, from a geotechnical engineering standpoint, that the proposed residential subdivision can generally be constructed as planned, provided that the conclusions and recommendations contained in this report are incorporated into the project design and construction. The predominant geotechnical condition that will impact the proposed development will be the presence of loose surface soils from the removal of the existing orchard trees. We recommend that grading provide a minimum of 3-feet of engineered fill in building pad areas to support the proposed residences.

SITE PREPARATION AND GRADING

Our general site preparation and grading recommendations are as follows:

1. The areas to be graded should be cleared of debris, surface vegetation, trees and their roots, organics, and existing abandoned utilities and buried structures (such as leach fields and septic tanks).
2. Building pad and other fill areas should be reworked such that the residences will be underlain by a minimum of 3-feet of compacted engineered fill. Depending on the final grading plan and whether the pad areas will be in cut or fill, this can be achieved with a combination of overexcavation, scarification, and fill placement operations. The extent and depth of overexcavation and compaction can be determined when the grading plan is finalized.
3. If zones of soft or loose soil are encountered during grading or soil processing operations, additional overexcavation of the loose soils may be required to expose deeper, firm soils. This should be determined in the field by the soils engineer.
4. Engineered fill soils should be compacted to at least 90 percent relative compaction at a moisture content at least 2 percent above the optimum moisture.
5. Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density determined by ASTM D1557 compaction test procedure. Optimum moisture is the water content (percentage by weight) corresponding to the maximum dry density.
6. Fill should be properly moisture conditioned and placed in thin lifts (normally 6 to 8 inches, depending on the compaction equipment used) and compacted as prescribed above.
7. The onsite soils are generally suitable for engineered fill, provided they are free of debris, significant vegetation, tree roots, rocks greater than 4 inches in largest dimension, and other deleterious matter. Debris, if encountered during grading, will need to be removed from the site.
8. Import fill, if required, should be subject to the evaluation of the soil engineer prior to its use. Import fill should have a Plasticity Index less than 10, contain no deleterious matter, and contain no rocks greater than 4 inches in largest dimension.
9. Observation and soil density tests should be performed during site preparation and grading to assist the contractor in obtaining the required degree of compaction and proper moisture

content. Where the compaction is outside the range required, additional effort and adjustments to the moisture content should be made until the specified compaction and moisture conditioning is achieved.

10. The soil engineer should be notified at least 48 hours prior to any grading operations. The procedure and methods of grading may then be discussed between the contractor and the soils engineer.

UTILITY TRENCH EXCAVATION AND BACKFILL

Excavations should conform to applicable State and Federal industrial safety requirements. Temporary trench sidewalls more than 4-feet deep may need to be laid back to 1H:1V or flatter to have stable sidewalls in the clean, sandy site soils. Flatter trench slopes may be required if seepage is encountered during construction or if exposed soil conditions are conducive to instability. If the trench side slopes cannot be excavated due to site constraints, shoring should be provided; we can provide shoring design recommendations upon request, if needed.

Materials quality, placement procedures and compaction operations for utility line bedding and shading materials should meet local agency and/or other applicable agency requirements. Utility trench backfill above the shading materials may be comprised of the onsite soils, provided they are processed to remove rubble, rock fragments over 4 inches in largest dimension, rubbish, vegetation, and other undesirable substances. Backfill materials should be placed in level lifts about 8 to 10 inches in loose thickness, moisture conditioned, and mechanically compacted according to the requirements contained in the "Site Preparation and Grading" section.

CALIFORNIA BUILDING CODE (CBC) SEISMIC DESIGN PARAMETERS

The subject site is located at approximately 37.5236 degrees north latitude and -120.8089 degrees west longitude. We are providing the following ASCE7-16 (2019 CBC) seismic design criteria, according to the SEAOC website, www.seismicmaps.org.

CBC SEISMIC DESIGN CRITERIA

Seismic Design Parameter	**ASCE7-16**
Site Modified Peak Ground Acceleration	0.35 g
Mapped Spectral Acceleration for Short Periods, S_s, for Site Class B with 5% damping	0.627 g
Mapped Spectral Acceleration for 1-Second Period, S_1, for Site Class B with 5% damping	0.254 g
Site Class	D
Site Coefficient F_a (for Site Class D)	1.298
Site Coefficient F_v (for Site Class D)	Null
Acceleration Parameter S_{MS} (adjusted for Site Class D)	0.814 g
Acceleration Parameter, S_{M1} (adjusted for Site Class D)	Null
Acceleration Parameter, S_{DS} (adjusted for Site Class D)	0.543 g
Acceleration Parameter, S_{D1} (adjusted for Site Class D)	Null

FOUNDATIONS

It is our opinion, from a geotechnical engineering standpoint, that shallow foundations can support the proposed residences. We recommend that the following criteria be incorporated in the design of shallow foundations.

SHALLOW STRIP AND ISOLATED FOOTINGS

Allowable Bearing Capacity (DL + LL) (may be increased by one-third for temporary seismic and wind loads, at the discretion of the structural engineer)	2,500 psf
Allowable Passive Equivalent Fluid Pressure (neglect the upper foot)	300 pcf
Allowable Base Friction Coefficient	0.35
Minimum Footing Depth Below Lowest Adjacent Finished Grade	18-inches

The following are our recommendations for the design of drilled, reinforced concrete piers.

DRILLED REINFORCED CONCRETE PIERS

Allowable Skin Friction, Vertically Down Ignore the upper foot	400 psf
Allowable Skin Friction, Vertically Up Ignore the upper foot	250 psf
Allowable Lateral Passive Resistance, equivalent fluid pressure, acting on 2 pier diameters, ignore the upper foot	300 pcf
Minimum Pier Diameter	12 inches

CONCRETE SLAB-ON-GRADE FLOORS

We recommend that concrete slab-on-grade interior floors be at least 5-inches thick, reinforced with reinforcing bars, and be underlain by a vapor retarder. We suggest utilizing ASTM E1745 and ASTM E1643 as guidelines for the vapor retarder material and its installation. The floor slab can be placed directly on properly prepared subgrade soil. From a geotechnical standpoint, a rock cushion is not required on these sandy site soils nor do we require a layer of sand above the vapor retarder.

During foundation and/or utility trench excavation, previously compacted subgrade soils may become disturbed. Before placement of the vapor retarder, the disturbed subgrade soils should be moisture conditioned and compacted according to the requirements outlined under the section titled "Site Preparation and Grading" in this report. Subgrade soils should be maintained in a moist and compacted condition until covered with the complete slab section.

RETAINING WALLS

The following pressures should be utilized in the design of retaining walls. The recommended lateral pressures are based on drained conditions. Backdrains are not required for retaining walls 2-feet tall or shorter.

RETAINING WALL DESIGN PARAMETERS

Active Equivalent Fluid Pressure (Level backfill and drained conditions)	30 pcf
At-Rest Equivalent Fluid Pressure (Level backfill and drained conditions)	50 pcf
Surcharge Load, where applicable	Designated by structural engineer

PAVEMENT RECOMMENDATIONS

The following are recommended structural pavement sections for the onsite soils. We obtained an R-Value of 72 for a mixture of soil obtained from the upper 3 feet from the test pits. Our pavement analyses are based upon an R-Value of 40 using the Caltrans Design Method for Flexible Pavement for a 20-year design life. The following are our recommendations for Asphalt Concrete (AC) pavement sections along with their corresponding traffic indices (TI), which are indications of load frequency and intensity.

AC PAVEMENT SECTIONS

Traffic Index	AC (in)	Class 2 AB (in)	Total (in)
TI=4.5	2.5 3	4 4	6.5 7
TI=5	2.5 3	5 4	7.5 7
TI=6	3	6	9
TI=7	3.5 4	8 7	11.5 11

The upper foot of subgrade soils should be compacted to at least 95 percent relative compaction to provide an unyielding surface. Class 2 aggregate base should also be compacted to at least 95 percent relative compaction.

ADDITIONAL SOIL ENGINEERING SERVICES

To a degree, the performance of the proposed project is dependent on the procedures and quality of the construction. Therefore, we should provide observation of the contractor's procedures and the exposed soil conditions, and field and laboratory testing during site preparation, mass grading, building pad preparation, placement and compaction of fill, underground utility backfilling, retaining wall backfilling, foundation construction, and pavement area construction. These observations will allow us to check the contractor's work for conformance with the intent of our recommendations and to observe any unanticipated soil conditions that could require modification of our recommendations. In addition, we would welcome the opportunity to meet with the contractor prior to the start of earthwork operations to discuss the procedures and methods of construction. This can facilitate the performance of the construction operation and minimize possible misunderstanding and construction delays.

LIMITATIONS

The conclusions and recommendations contained in this report are based upon the information provided to us regarding the proposed site improvements, subsurface conditions encountered during our field exploration, laboratory testing, and professional judgment. This study has been conducted in accordance with current professional geotechnical engineering standards; no other warranty is expressed or implied.

If changes occur in the nature, design, and/or location of the proposed improvements are planned, or if it is found during construction that subsurface conditions differ from those described in this report, then the conclusions and recommendations in this report shall be considered invalid, unless the changes are reviewed, and the conclusions and recommendations are modified or approved in writing.

Should you have questions or need additional information, please contact us. We appreciate the opportunity to provide professional services to you and look forward to working with you through the design and construction of this project.

Respectfully submitted,

BAEZ GEOTECHNICAL GROUP

REGISTERED PROFESSIONAL ENGINEER
WILLIAM R. STEVENS
No. 2339
GEOTECHNICAL
STATE OF CALIFORNIA

Stefanie M. Parman
Project Engineer

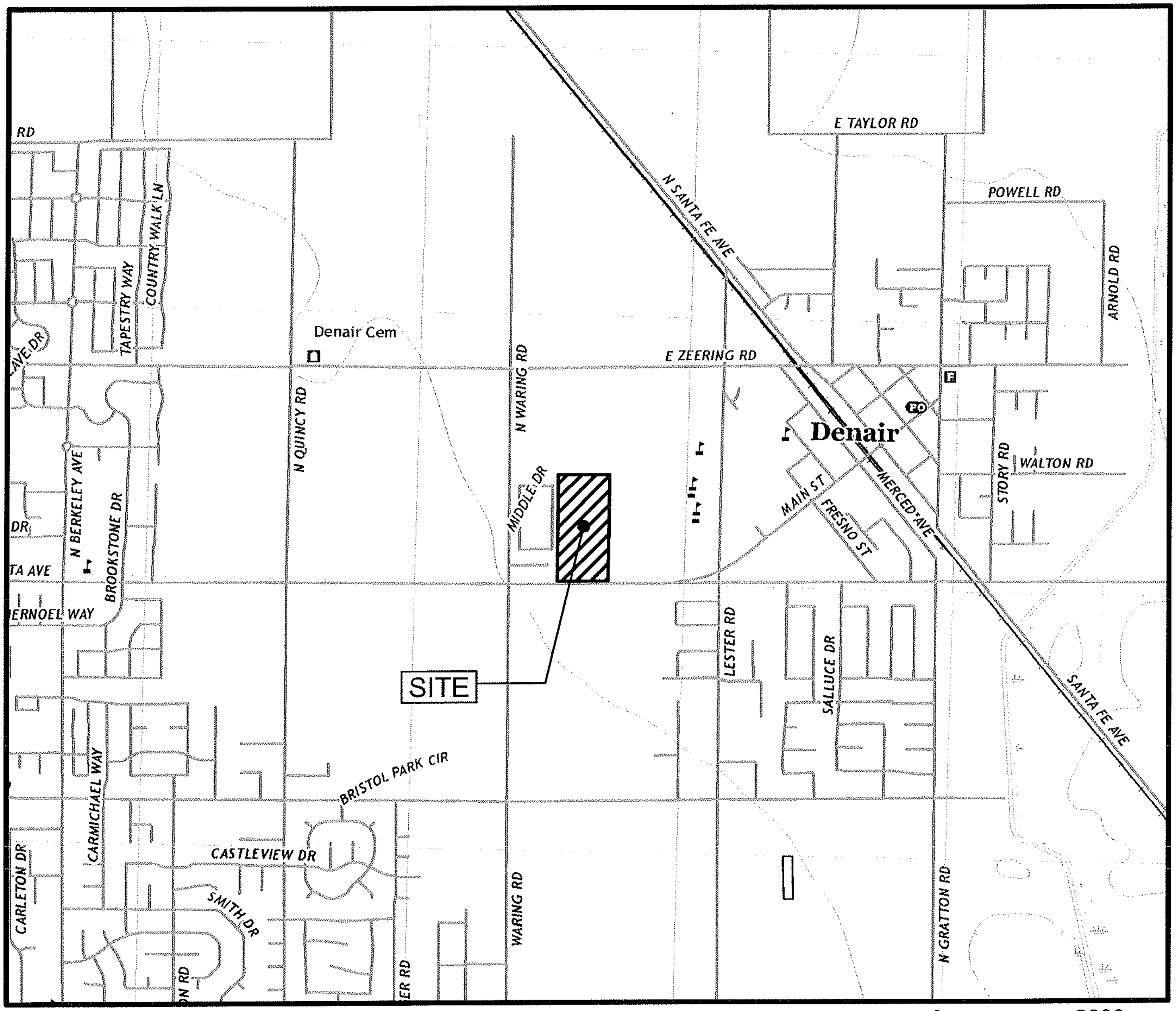
William R. Stevens
Principal Engineer
GE 2339

Attachments:

- Plate 1 – Vicinity Map
- Plate 2 – Site Plan
- Appendix A – Test Pit Logs
- Appendix B – Field Percolation Test Results
- Appendix C – Laboratory Test Results

C:\BGG\1Projects\G188-Lazares Monte Vista\3-GI\GI G188.03 Monte Vista.docx

BGG NUMBER: G188.03 DATE: 04/22/2021 DRAWN BY: SP



BASE: PORTION OF U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLE, DENAIR, CALIFORNIA, PHOTOREVISED 2018, AT A SCALE OF 1:24,000.

0 2000

1 INCH = 2000 FEET

VICINITY MAP

MONTE VISTA COLLECTION RESIDENTIAL SUBDIVISION

3531 EAST MONTE VISTA AVENUE

DENAIR, CALIFORNIA

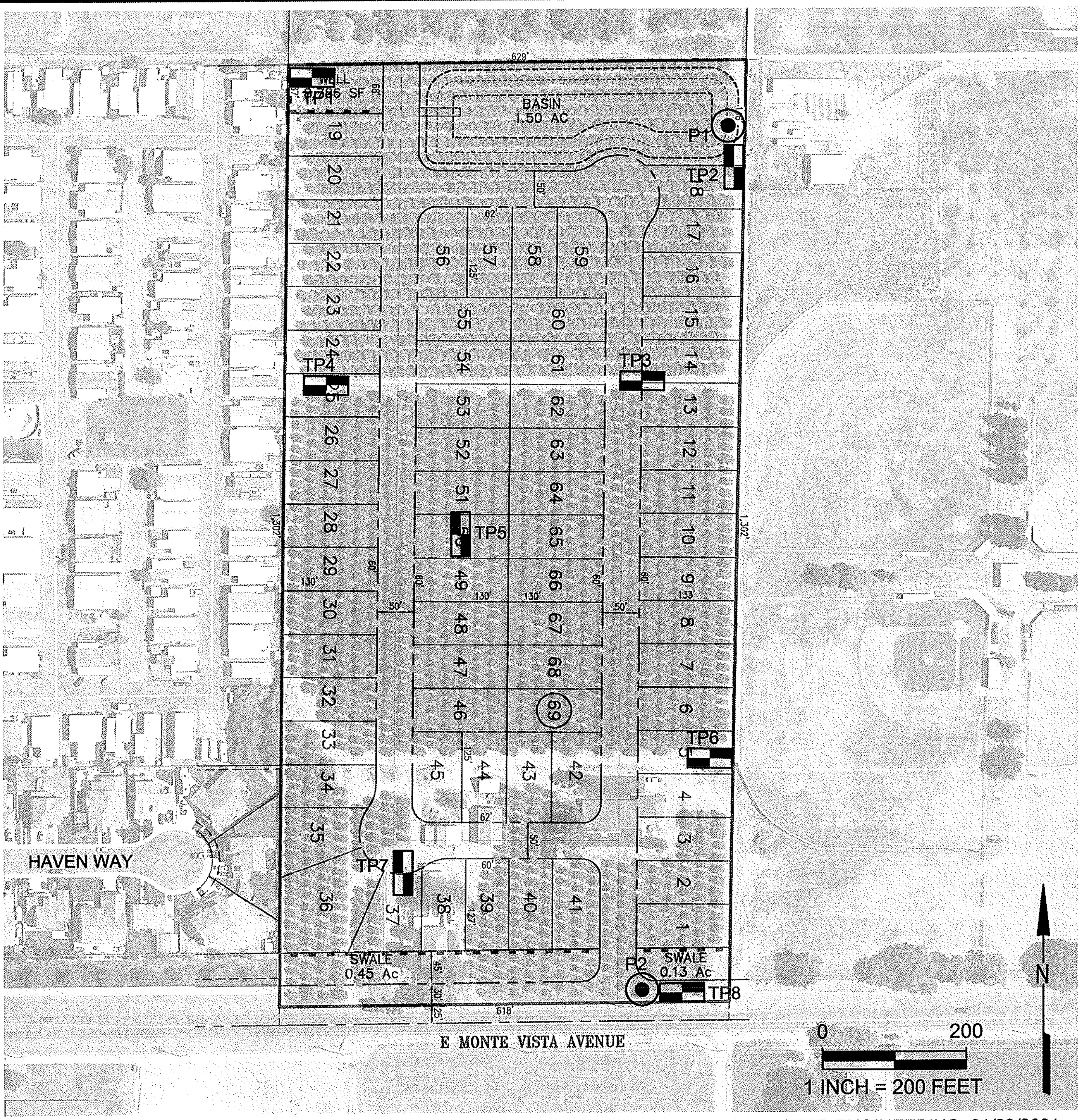
FOR

LAZARES COMPANIES, INC.

BAEZ GEOTECHNICAL GROUP

PLATE 1

DRAWN BY: KJR
DATE: 03/26/2021
BGG NUMBER: G188.03



BASE: GOOGLE EARTH IMAGE AND MONTE VISTA COLLECTION SITE PLAN, BY NORTHSTAR ENGINEERING, 01/29/2021.

EXPLANATION

TP8 APPROXIMATE TEST PIT LOCATION

P2 APPROXIMATE PERCOLATION TEST LOCATION

BAEZ GEOTECHNICAL GROUP

SITE PLAN

MONTE VISTA COLLECTION RESIDENTIAL SUBDIVISION

3531 EAST MONTE VISTA AVENUE
DENAIR, CALIFORNIA
FOR
LAZARES COMPANIES

APPENDIX A

Test Pit Logs

TEST PIT NUMBER: TP1

PROJECT NAME: Monte Vista Collection Subdivision
PROJECT NUMBER: G188.03
DATE EXCAVATED: 04/08/2021
EXCAVATION CONTRACTOR: Lion River Construction
EXCAVATION METHOD: CAT 303.5E2
LOGGED BY: SP
NOTES: Elevations obtained from Google Earth

PROJECT LOCATION: 3531 East Monte Vista Avenue, Denair
CLIENT: Lazares Companies, Inc.
GROUND ELEVATION: 123 feet
GROUNDWATER: Groundwater not encountered
SAMPLER TYPE: Bulk Sample; Modified California Sampler

USCS	MATERIAL DESCRIPTION	ELEVATION (feet)	DEPTH (feet)	SAMPLER	BLOW COUNT (blows/foot)	DRY UNIT WEIGHT (pcf)	MOISTURE CONTENT (%)	PLASTICITY INDEX	FINES CONTENT % PASSING #200
SM/SP	SILTY SAND to SAND with SILT, brown, moist, loose to medium dense, fine- to medium-grained sand	123	0	Bulk Sample					
	below 2 feet, yellow-brown, medium dense								
	(Sample consolidated 1.0% with a 2,500 psf surcharge load and an additional 1.2% upon saturation)			Modified California Sampler			5.6		
		118	5						
	Bottom of Test Pit at 6 feet below the ground surface (bgs). Groundwater not encountered.								
		113	10						
		108	15						

TEST PIT NUMBER: TP2

PROJECT NAME: Monte Vista Collection Subdivision
PROJECT NUMBER: G188.03
DATE EXCAVATED: 04/08/2021
EXCAVATION CONTRACTOR: Lion River Construction
EXCAVATION METHOD: CAT 303.5E2
LOGGED BY: SP
NOTES: Elevations obtained from Google Earth

PROJECT LOCATION: 3531 East Monte Vista Avenue, Denair
CLIENT: Lazares Companies, Inc.
GROUND ELEVATION: 122 feet
GROUNDWATER: Groundwater not encountered
SAMPLER TYPE: Bulk Sample; Modified California Sampler

USCS	MATERIAL DESCRIPTION	ELEVATION (feet)	DEPTH (feet)	SAMPLER	BLOW COUNT (blows/foot)	DRY UNIT WEIGHT (pcf)	MOISTURE CONTENT (%)	PLASTICITY INDEX	FINES CONTENT % PASSING #200
SM/SP	SILTY SAND to SAND with SILT, brown, moist, medium dense, fine- to medium-grained sand	122	0						
	below 2 feet, yellow-brown to orange-brown			Modified California Sampler					
		117	5						
	Bottom of Test Pit at 6 feet bgs. Groundwater not encountered. Percolation Test P1 conducted at bottom of Test Pit.								
		112	10						
		107	15						

TEST PIT NUMBER: TP3

PROJECT NAME: Monte Vista Collection Subdivision
PROJECT LOCATION: 3531 East Monte Vista Avenue, Denair
PROJECT NUMBER: G188.03
CLIENT: Lazares Companies, Inc.
DATE EXCAVATED: 04/08/2021
GROUND ELEVATION: 122 feet
EXCAVATION CONTRACTOR: Lion River Construction
GROUNDWATER: Groundwater not encountered
EXCAVATION METHOD: CAT 303.5E2
SAMPLER TYPE: Bulk Sample; Modified California Sampler
LOGGED BY: SP
NOTES: Elevations obtained from Google Earth

USCS	MATERIAL DESCRIPTION	ELEVATION (feet)	DEPTH (feet)	SAMPLER	BLOW COUNT (blows/foot)	DRY UNIT WEIGHT (pcf)	MOISTURE CONTENT (%)	PLASTICITY INDEX	FINES CONTENT % PASSING #200
		122	0						
SM/ SP	SILTY SAND to SAND with SILT, brown, moist, medium dense, fine- to coarse-grained sand			Bulk Sample					
	below 2 feet, orange-brown								
	(Sample consolidated 1.6% with a 2,500 psf surcharge load and an additional 3.3% upon saturation)			Modified California Sampler			7.8		
SM	SILTY SAND, gray and tan, dry to moist, dense, fine- to coarse-grained sand, weakly cemented								
SM/ SP	SILTY SAND to SAND with SILT, brown, moist, medium dense, fine- to coarse-grained sand	117	5						
	Bottom of Test Pit at 6 feet bgs. Groundwater not encountered.								
		112	10						
		107	15						

TEST PIT NUMBER: TP4

PROJECT NAME: Monte Vista Collection Subdivision
PROJECT LOCATION: 3531 East Monte Vista Avenue, Denair
PROJECT NUMBER: G188.03
CLIENT: Lazares Companies, Inc.
DATE EXCAVATED: 04/08/2021
GROUND ELEVATION: 123 feet
EXCAVATION CONTRACTOR: Lion River Construction
GROUNDWATER: Groundwater not encountered
EXCAVATION METHOD: CAT 303.5E2
SAMPLER TYPE: Bulk Sample; Modified California Sampler
LOGGED BY: SP
NOTES: Elevations obtained from Google Earth

USCS	MATERIAL DESCRIPTION	ELEVATION (feet)	DEPTH (feet)	SAMPLER	BLOW COUNT (blows/foot)	DRY UNIT WEIGHT (pcf)	MOISTURE CONTENT (%)	PLASTICITY INDEX	FINES CONTENT % PASSING #200
		123	0						
SM/ SP	SILTY SAND to SAND with SILT, brown, moist, medium dense, fine- to medium-grained sand			Bulk Sample					
	below 2 feet, orange-brown, fine- to coarse-grained sand			Modified California Sampler					
		118	5						
	Bottom of Test Pit at 5 feet bgs. Groundwater not encountered.								
		113	10						
		108	15						

TEST PIT NUMBER: TP5

PROJECT NAME: Monte Vista Collection Subdivision
PROJECT NUMBER: G188.03
DATE EXCAVATED: 04/08/2021
EXCAVATION CONTRACTOR: Lion River Construction
EXCAVATION METHOD: CAT 303.5E2
LOGGED BY: SP
NOTES: Elevations obtained from Google Earth

PROJECT LOCATION: 3531 East Monte Vista Avenue, Denair
CLIENT: Lazares Companies, Inc.
GROUND ELEVATION: 123 feet
GROUNDWATER: Groundwater not encountered
SAMPLER TYPE: Bulk Sample; Modified California Sampler

USCS	MATERIAL DESCRIPTION	ELEVATION (feet)	DEPTH (feet)	SAMPLER	BLOW COUNT (blows/foot)	DRY UNIT WEIGHT (pcf)	MOISTURE CONTENT (%)	PLASTICITY INDEX	FINES CONTENT % PASSING #200
		123	0						
SM/SP	SILTY SAND to SAND with SILT, brown, moist, medium dense, fine- to medium-grained sand below 2 feet, orange-brown, fine- to coarse-grained sand			Bulk Sample					
		118	5						
	Bottom of Test Pit at 5 feet bgs. Groundwater not encountered.								
		113	10						
		108	15						

TEST PIT NUMBER: TP6

PROJECT NAME: Monte Vista Collection Subdivision
PROJECT LOCATION: 3531 East Monte Vista Avenue, Denair
PROJECT NUMBER: G188.03
CLIENT: Lazares Companies, Inc.
DATE EXCAVATED: 04/08/2021
GROUND ELEVATION: 123 feet
EXCAVATION CONTRACTOR: Lion River Construction
GROUNDWATER: Groundwater not encountered
EXCAVATION METHOD: CAT 303.5E2
SAMPLER TYPE: Bulk Sample; Modified California Sampler
LOGGED BY: SP
NOTES: Elevations obtained from Google Earth

USCS	MATERIAL DESCRIPTION	ELEVATION (feet)	DEPTH (feet)	SAMPLER	BLOW COUNT (blows/foot)	DRY UNIT WEIGHT (pcf)	MOISTURE CONTENT (%)	PLASTICITY INDEX	FINES CONTENT % PASSING #200
		123	0						
SM	SILTY SAND, tan-brown, dry to moist, medium dense, fine- to medium-grained sand			Bulk Sample					
SM/SP	SILTY SAND to SAND with SILT, mottled brown, tan, and rust-orange, moist, medium dense, fine- to medium-grained sand (Sample consolidated 0.9% with a 2,500 psf surcharge load and an additional 1.1% upon saturation)			Modified California Sampler			6.0		
		118	5						
	Bottom of Test Pit at 5 feet bgs. Groundwater not encountered.								
		113	10						
		108	15						

TEST PIT NUMBER: TP7

PROJECT NAME: Monte Vista Collection Subdivision
PROJECT NUMBER: G188.03
DATE EXCAVATED: 04/08/2021
EXCAVATION CONTRACTOR: Lion River Construction
EXCAVATION METHOD: CAT 303.5E2
LOGGED BY: SP
NOTES: Elevations obtained from Google Earth

PROJECT LOCATION: 3531 East Monte Vista Avenue, Denair
CLIENT: Lazares Companies, Inc.
GROUND ELEVATION: 122 feet
GROUNDWATER: Groundwater not encountered
SAMPLER TYPE: Bulk Sample; Modified California Sampler

USCS	MATERIAL DESCRIPTION	ELEVATION (feet)	DEPTH (feet)	SAMPLER	BLOW COUNT (blows/foot)	DRY UNIT WEIGHT (pcf)	MOISTURE CONTENT (%)	PLASTICITY INDEX	FINES CONTENT % PASSING #200
SM	SILTY SAND, brown, dry to moist, medium dense, fine- to medium-grained sand	122	0	Bulk Sample					
SM/ SP	SILTY SAND to SAND with SILT, brown, moist, medium dense, fine- to medium-grained sand (Sample consolidated 1.4% with a 2,500 psf surcharge load and an additional 1.6% upon saturation)			Modified California Sampler		6.4			
	Bottom of Test Pit at 5 feet bgs. Groundwater not encountered.	117	5						
		112	10						
		107	15						

TEST PIT NUMBER: TP8

PROJECT NAME: Monte Vista Collection Subdivision
PROJECT LOCATION: 3531 East Monte Vista Avenue, Denair
PROJECT NUMBER: G188.03
CLIENT: Lazares Companies, Inc.
DATE EXCAVATED: 04/08/2021
GROUND ELEVATION: 125 feet
EXCAVATION CONTRACTOR: Lion River Construction
GROUNDWATER: Groundwater not encountered
EXCAVATION METHOD: CAT 303.5E2
SAMPLER TYPE: Bulk Sample; Modified California Sampler
LOGGED BY: SP
NOTES: Elevations obtained from Google Earth

USCS	MATERIAL DESCRIPTION	ELEVATION (feet)	DEPTH (feet)	SAMPLER	BLOW COUNT (blows/foot)	DRY UNIT WEIGHT (pcf)	MOISTURE CONTENT (%)	PLASTICITY INDEX	FINES CONTENT % PASSING #200
SM	SILTY SAND, brown, dry to moist, medium dense, fine- to medium-grained sand	125	0	Bulk Sample					
SM/SP	SILTY SAND to SAND with SILT, brown, moist, medium dense, fine- to medium-grained sand			Modified California Sampler					
		120	5						
	Bottom of Test Pit at 6 feet bgs. Groundwater not encountered. Percolation Test P2 conducted at 3 feet bgs.								
		115	10						
		110	15						

APPENDIX B

Percolation Test Results

APPENDIX B - FIELD PERCOLATION TESTING

We performed field percolation testing at the site on April 8, 2021 to support the design of stormwater management facilities for the proposed subdivision. Percolation testing was performed at the specified depths at the locations shown on Plate 2, Site Plan. Test pits were excavated to the specified percolation test depths at each location. The soils encountered in the test pits were classified and logged, and the bottom of the test pits were then saturated. Double ring infiltrometers were utilized for percolation testing by setting the infiltrometer into the saturated soil, filling both the inner and outer rings with water, and measuring the rate of water drop in the inner ring. The rate of the water level drop was monitored and recorded until a stabilized percolation rate was observed. The following are the results of the field percolation testing conducted at the site:

P1 at 6 feet bgs (Silty Sand to Sand with Silt)

Elapsed Time (min:sec)	Test Duration (min:sec)	Water Level (feet)	Water Level Drop (inches)	Percolation Rate (in/hour)
0	0	5.7		
1:47	1:47	5.6	0.1	6.73
3:41	1:54	5.5	0.1	6.32
5:47	2:06	5.4	0.1	5.71
7:50	2:03	5.3	0.1	5.85
10:00	2:10	5.2	0.1	5.54
12:15	2:15	5.1	0.1	5.33
14:30	2:15	5.0	0.1	5.33
16:46	2:16	4.9	0.1	5.29
19:01	2:15	4.8	0.1	5.33
21:15	2:14	4.7	0.1	5.37
23:30	2:15	4.6	0.1	**5.33**

P2 at 3 feet bgs (Silty Sand to Sand with Silt)

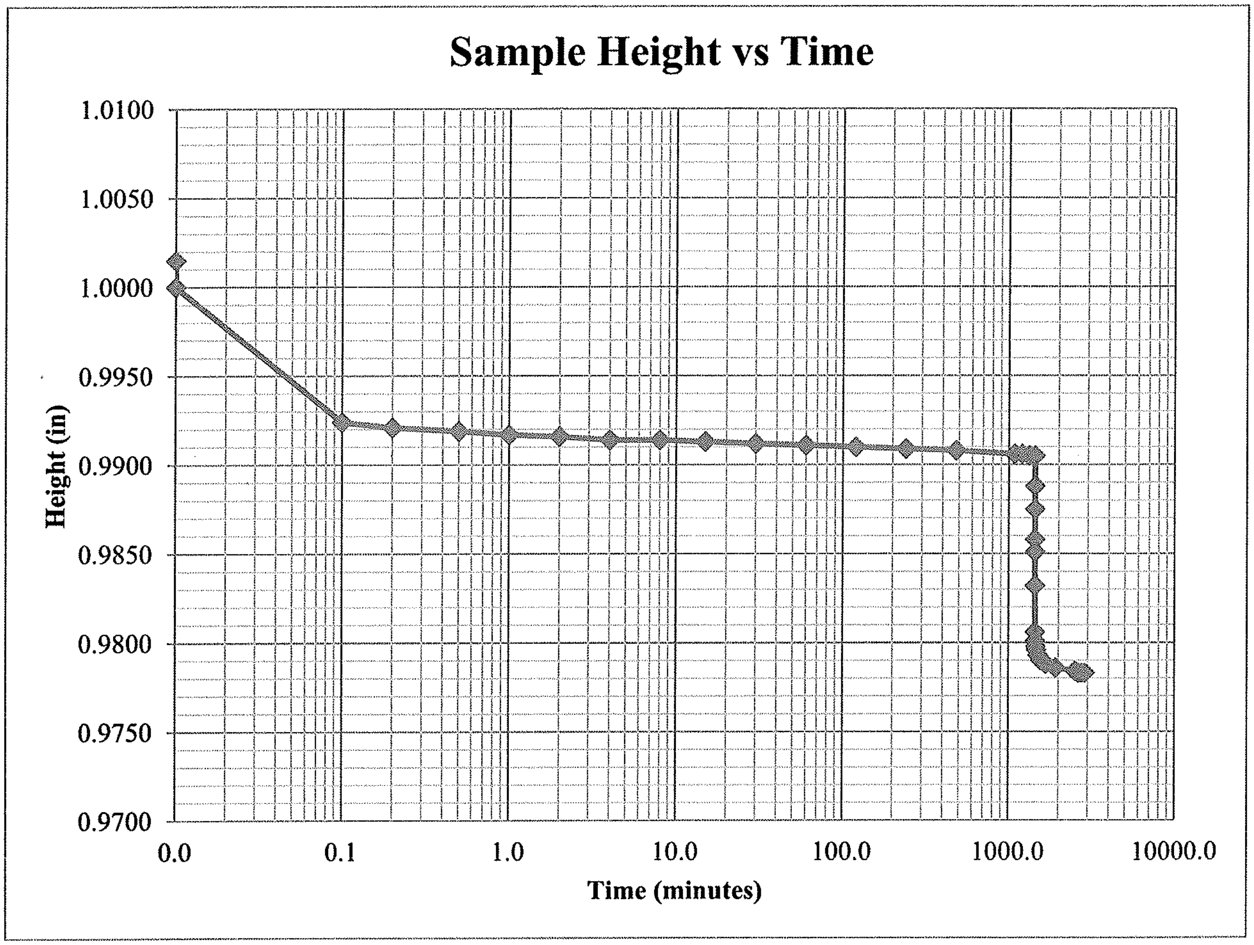
Elapsed Time (min:sec)	Test Duration (min:sec)	Water Level (inches)	Water Level Drop (inches)	Percolation Rate (in/hour)
0	0	5.9		
2:02	2:02	5.8	0.1	2.95
4:20	2:18	5.7	0.1	2.61
6:40	2:20	5.6	0.1	2.57
9:05	2:25	5.5	0.1	2.48
11:30	2:25	5.4	0.1	2.48
14:00	2:30	5.3	0.1	2.40
16:30	2:30	5.2	0.1	2.40
19:00	2:30	5.1	0.1	2.40
21:30	2:30	5.0	0.1	2.40
24:00	2:30	4.9	0.1	**2.40**

APPENDIX C

Laboratory Test Results

ONE DIMENSIONAL SWELL/COLLAPSE POTENTIAL - METHOD 'C' Modified

ASTM D4546



SAMPLE ID:	TP1 @ 2.5-3	IN-SITU LOAD (psf):	350
SAMPLE DESCRIPTION:	See exploration logs	DESIGN LOAD (psf):	2500
TYPE OF WATER USED:	Tap USCS: n/a	SOURCE OF WATER:	Distilled
TRANSPORTATION METHOD:	Insulated bucket	SAMPLING DATE:	n/a
STORAGE ENVIRONMENT:	Controlled	TEST START DATE:	04/15/21
Remolded? (Y/N):	N	Initial % Saturation:	34.05
Number of lifts, if remolded:	n/a	Final % Saturation:	100.00
Specific Gravity, <#4 (Measured):	2.669	Initial water content:	5.60
Initial sample height (in):	1.0015	Final water content:	15.16
Dry in-situ load height (in):	1.0000	Post-test dry density (pcf):	118.54
Dry design load height (in):	0.9905	*Dry In-situ load % SWELL/COLLAPSE:*	*-0.15*
Wet design load height (in):	0.9783	*Dry design load % SWELL/COLLAPSE:*	*-0.95*
Initial sample mass (g):	145.61	*Wet design load % SWELL/COLLAPSE:*	*-1.22*
Final saturated sample mass (g):	158.79	***Overall % SWELL/COLLAPSE:***	***-2.32***

Testing remarks:

PROJECT NAME: G188.03, Monte Vista Collection, Denair, CA
PROJECT NUMBER: 14368.000.103 PHLAB
CLIENT: Baez Geotechnical Group
PHASE NUMBER: LAB

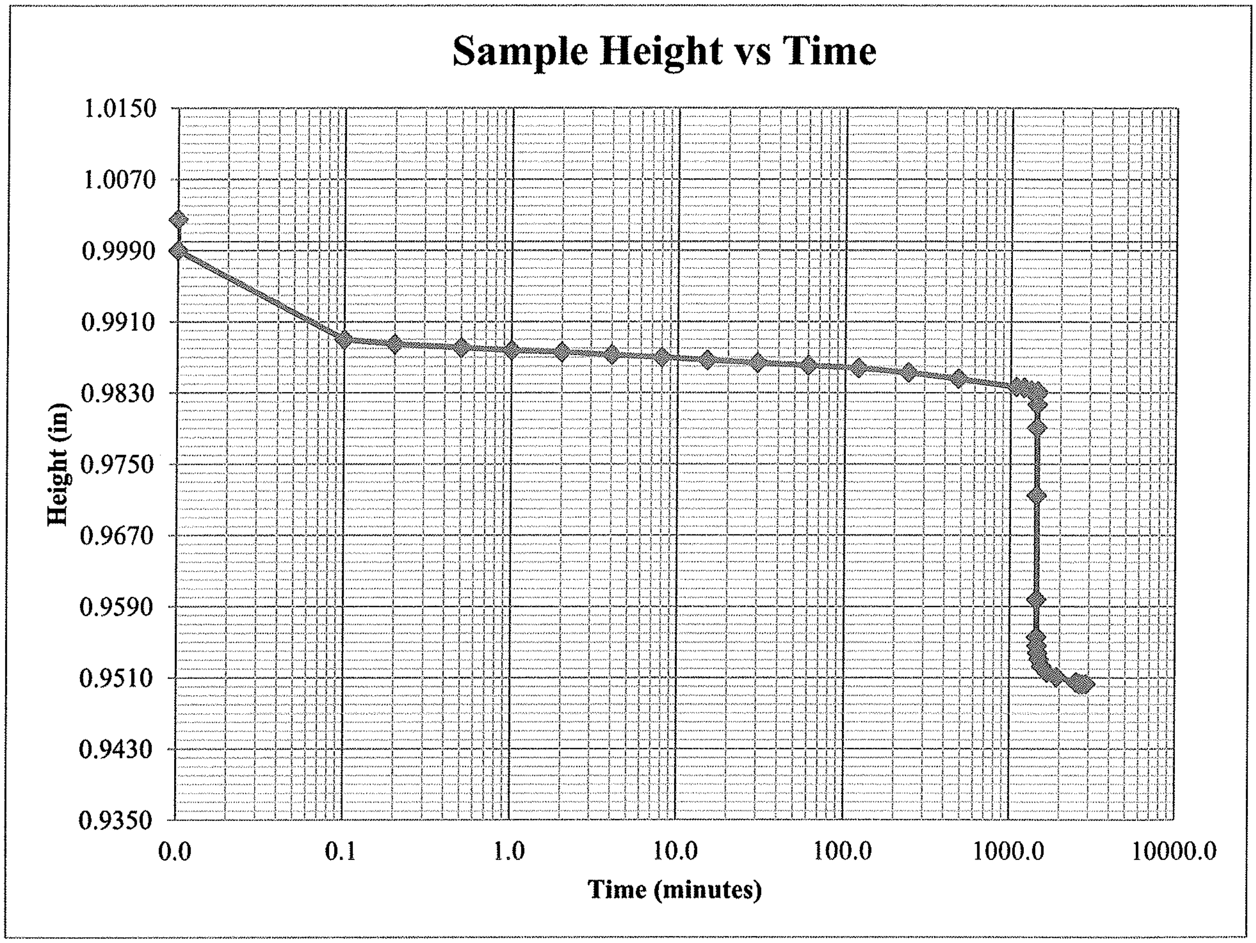
REPORT DATE: 04/19/21

ENGEO
Expect Excellence

Tested by: K. Lecce   Reviewed by: M. Tong

ONE DIMENSIONAL SWELL/COLLAPSE POTENTIAL - METHOD 'C' Modified

ASTM D4546



SAMPLE ID: TP3 @ 3.5-4
SAMPLE DESCRIPTION: See exploration logs
TYPE OF WATER USED: Tap
TRANSPORTATION METHOD: Insulated bucket
STORAGE ENVIRONMENT: Controlled

USCS: n/a

IN-SITU LOAD (psf): 450
DESIGN LOAD (psf): 2500
SOURCE OF WATER: Distilled
SAMPLING DATE: n/a
TEST START DATE: 04/15/21

Remolded? (Y/N): N
Number of lifts, if remolded: n/a
Specific Gravity, <#4 (Measured): 2.664
Initial sample height (in): 1.0025
Dry in-situ load height (in): 0.9990
Dry design load height (in): 0.9832
Wet design load height (in): 0.9503
Initial sample mass (g): 142.45
Final saturated sample mass (g): 153.75

Initial % Saturation: 40.15
Final % Saturation: 100.00
Initial water content: 7.75
Final water content: 16.29
Post-test dry density (pcf): 115.89
Dry In-situ load % SWELL/COLLAPSE: -0.35
Dry design load % SWELL/COLLAPSE: -1.58
Wet design load % SWELL/COLLAPSE: -3.28
Overall % SWELL/COLLAPSE: ***-5.21***

Testing remarks:

PROJECT NAME: G188.03, Monte Vista Collection, Denair, CA
PROJECT NUMBER: 14368.000.103 PHLAB
CLIENT: Baez Geotechnical Group
PHASE NUMBER: LAB

REPORT DATE: 04/19/21

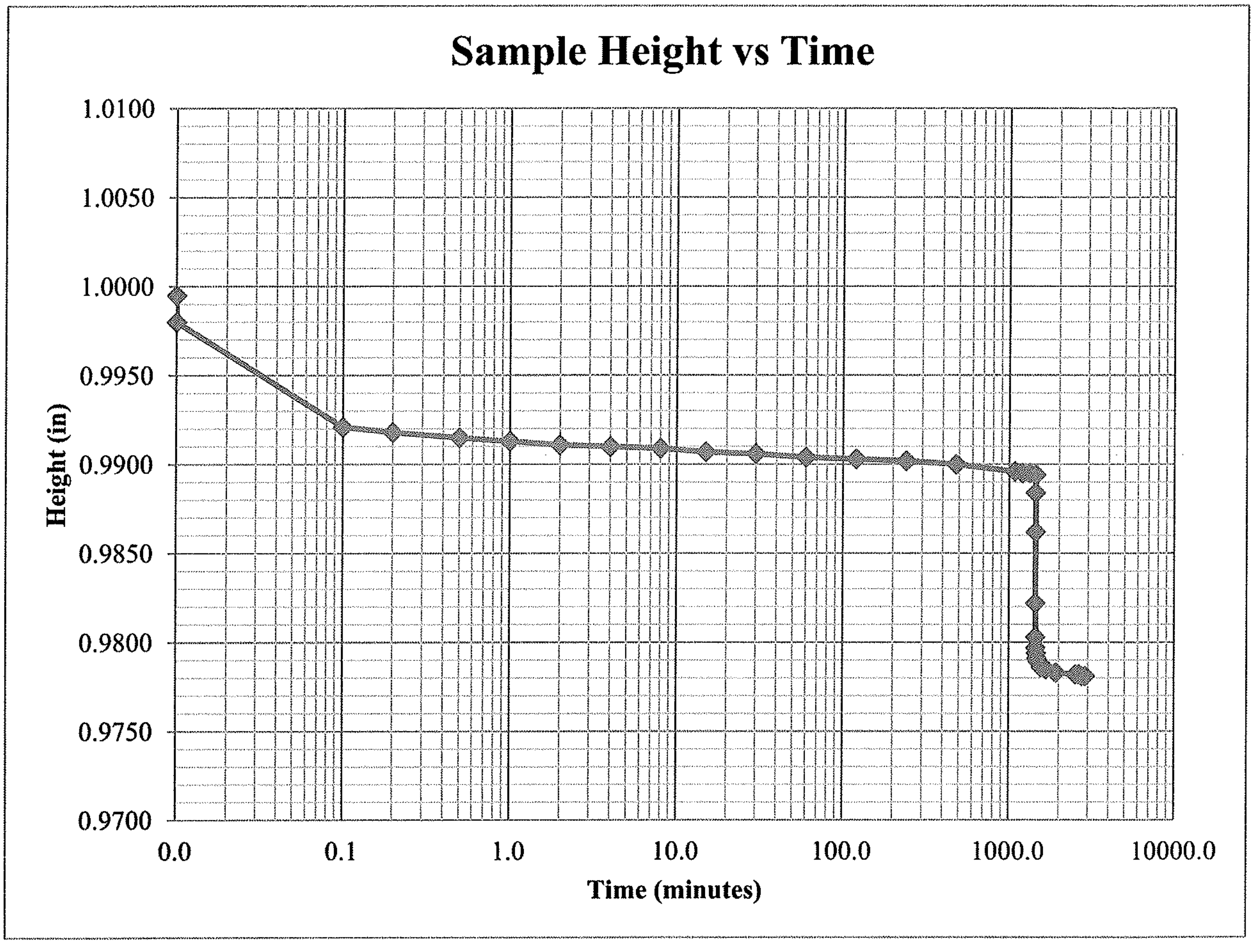
ENGEO
Expect Excellence

Tested by: K. Lecce

Reviewed by: M. Tong

ONE DIMENSIONAL SWELL/COLLAPSE POTENTIAL - METHOD 'C' Modified

ASTM D4546



SAMPLE ID:	**TP6 @ 3-3.5**		**IN-SITU LOAD (psf):**	**400**
SAMPLE DESCRIPTION:	**See exploration logs**		**DESIGN LOAD (psf):**	**2500**
TYPE OF WATER USED:	**Tap**	**USCS: n/a**	**SOURCE OF WATER:**	**Distilled**
TRANSPORTATION METHOD:	**Insulated bucket**		**SAMPLING DATE:**	**n/a**
STORAGE ENVIRONMENT:	**Controlled**		**TEST START DATE:**	**04/15/21**

Remolded? (Y/N):	**N**	**Initial % Saturation:**	**40.32**
Number of lifts, if remolded:	**n/a**	**Final % Saturation:**	**99.98**
Specific Gravity, <#4 (Measured):	**2.707**	**Initial water content:**	**5.98**
Initial sample height (in):	**0.9995**	**Final water content:**	**13.69**
Dry in-situ load height (in):	**0.9980**	**Post-test dry density (pcf):**	**123.21**
Dry design load height (in):	**0.9894**	*Dry In-situ load % SWELL/COLLAPSE:*	*-0.15*
Wet design load height (in):	**0.9781**	*Dry design load % SWELL/COLLAPSE:*	*-0.86*
Initial sample mass (g):	**151.48**	*Wet design load % SWELL/COLLAPSE:*	*-1.13*
Final saturated sample mass (g):	**162.49**	***Overall % SWELL/COLLAPSE:***	***-2.14***

Testing remarks:

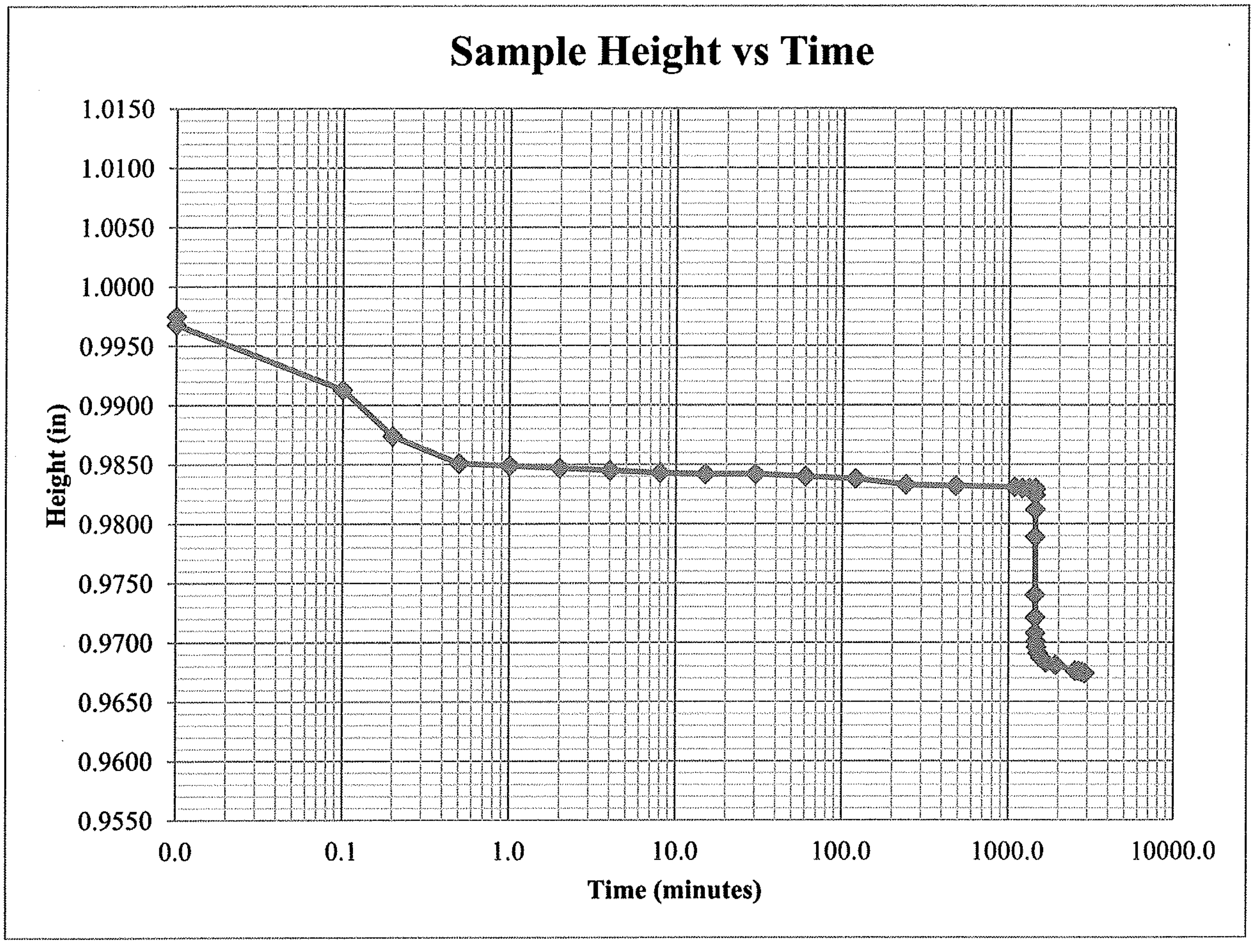
PROJECT NAME: **G188.03, Monte Vista Collection, Denair, CA**
REPORT DATE: **04/19/21**
PROJECT NUMBER: **14368.000.103 PHLAB**
CLIENT: **Baez Geotechnical Group**
PHASE NUMBER: **LAB**

ENGEO
Expect Excellence

Tested by: K. Lecce   Reviewed by: M. Tong

ONE DIMENSIONAL SWELL/COLLAPSE POTENTIAL - METHOD 'C' Modified

ASTM D4546



SAMPLE ID:	TP7 @ 2-2.5		**IN-SITU LOAD (psf):**	300
SAMPLE DESCRIPTION:	See exploration logs		**DESIGN LOAD (psf):**	2500
TYPE OF WATER USED:	Tap	**USCS:** n/a	**SOURCE OF WATER:**	faucet
TRANSPORTATION METHOD:	Insulated bucket		**SAMPLING DATE:**	n/a
STORAGE ENVIRONMENT:	Controlled		**TEST START DATE:**	04/12/21

Remolded? (Y/N):	N	**Initial % Saturation:**	32.42
Number of lifts, if remolded:	n/a	**Final % Saturation:**	99.99
Specific Gravity, <#4 (Measured):	2.655	**Initial water content:**	6.44
Initial sample height (in):	0.9975	**Final water content:**	18.10
Dry in-situ load height (in):	0.9968	**Post-test dry density (pcf):**	111.86
Dry design load height (in):	0.9830	*Dry In-situ load % SWELL/COLLAPSE:*	*-0.07*
Wet design load height (in):	0.9674	*Dry design load % SWELL/COLLAPSE:*	*-1.38*
Initial sample mass (g):	136.62	*Wet design load % SWELL/COLLAPSE:*	*-1.56*
Final saturated sample mass (g):	151.58	***Overall % SWELL/COLLAPSE:***	***-3.02***

Testing remarks:

PROJECT NAME: G188.03, Monte Vista Collection, Denair, CA
PROJECT NUMBER: 14368.000.103 PHLAB
CLIENT: Baez Geotechnical Group
PHASE NUMBER: LAB

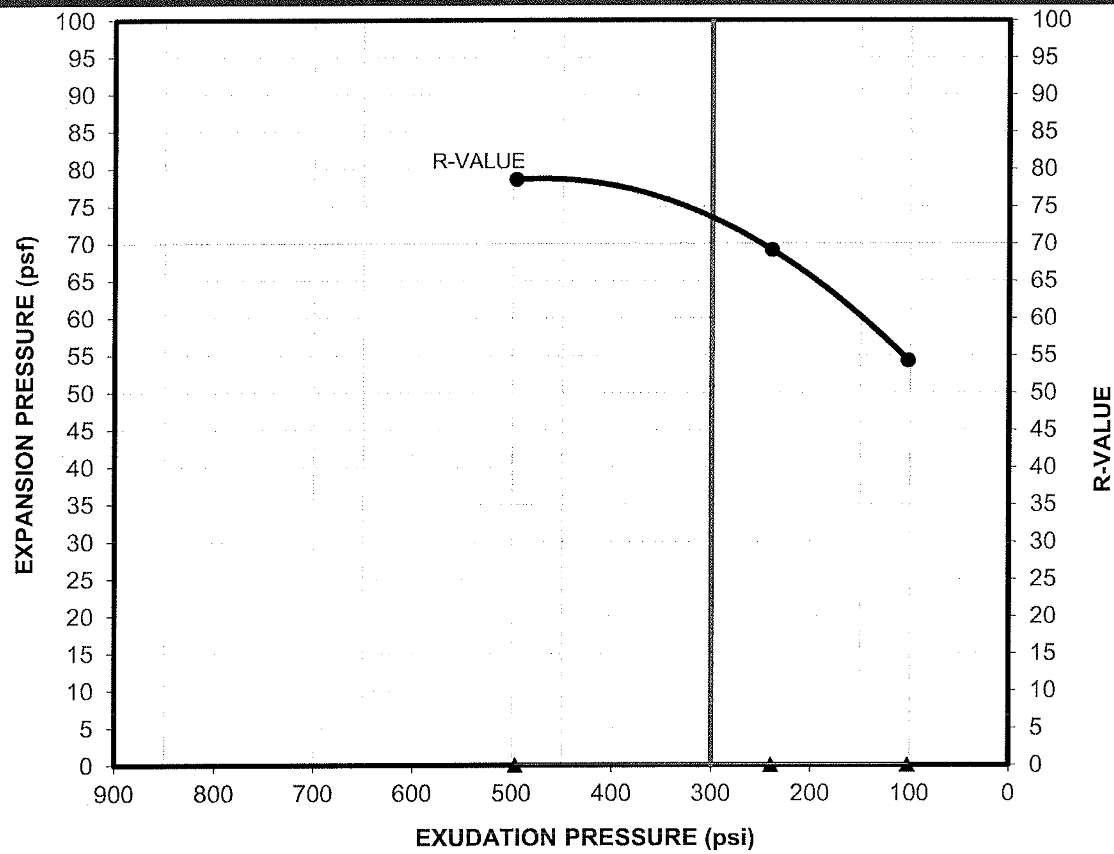
REPORT DATE: 04/16/21

ENGEO
Expect Excellence

Tested by: K. Lecce   Reviewed by: M. Tong

Lab Address: 17278 Golden Valley Parkway, Lathrop, CA 95330. Phone No. (209) 835-0610.

R-VALUE TEST REPORT
CTM 301



SAMPLE ID	MATERIAL DESCRIPTION [1]	SAMPLE LOCATION
TP1+5+8@0-3	Yellowish brown SAND	TP1+5+8 at 0-3 feet

SPECIMENS	1	2	3
EXUDATION PRESSURE (psi)	496	240	102
EXPANSION PRESSURE (psf)	0	0	0
R-VALUE	79	69	54
MOISTURE CONTENT (%)	7.3	8.5	9.7
DRY DENSITY (pcf)	124.0	123.9	123.2
EXPANSION PRESSURE (psf) AT EXUDATION PRESSURE OF 300 psi		0	

	TEST RESULT
R-VALUE AT EXUDATION PRESSURE OF 300 psi	73

[1] Material description per ASTM D2488

ENGEO
Expect Excellence

CLIENT: Baez Geotechnical Group, Inc.
PROJECT NAME: G188.03, Monte Vista Collection, Denair, CA
PROJECT NO: 14368.000.103 PHLAB
PROJECT LOCATION: Denair, CA
REPORT DATE: 4/14/2021
TESTED BY: R. Montalvo
REVIEWED BY: M. Gilbert

CENTRAL CALIFORNIA INFORMATION CENTER
California Historical Resources Information System
Department of Anthropology – California State University, Stanislaus
One University Circle, Turlock, California 95382
(209) 667-3307

Alpine, Calaveras, Mariposa, Merced, San Joaquin, Stanislaus & Tuolumne Counties

Date: 3/16/2021

Records Search File #: 11705N
Project: General Plan Amendment
APN 024-012-009, 3531 E. Monte Vista
Avenue, Denair, CA

Trevor Smith, Vice President
Lazares Companies
16795 Lark Avenue, Suite 106
Los Gatos, CA 95032
209-662-5098
tsmith@lazarescompanies.com

Dear Mr. Smith:

We have conducted a non-confidential records search as per your request for the above-referenced project area located on the Denair USGS 7.5-minute quadrangle map in Stanislaus County.

Search of our files includes review of our maps for the specific project area and the immediate vicinity of the project area, and review of the following:

National Register of Historic Places (NRHP)
California Register of Historical Resources (CRHR)
California Inventory of Historic Resources (1976)
California Historical Landmarks
California Points of Historical Interest listing
Office of Historic Preservation Built Environment Resource Directory (BERD) and the Archaeological Determinations of Eligibility (ADOE)
Survey of Surveys (1989)
Caltrans State and Local Bridges Inventory
General Land Office Plats
Other pertinent historic data available at the CCaIC for each specific county

The following details the results of the records search:

Prehistoric or historic resources within the project area:

- There are no **formally recorded** prehistoric or historic archaeological sites or historic structures within the project area.

- The General Land Office survey plat for T5S R11E (dated 1855) shows the W ½ of the SE ¼ of Section 6 as a 75.98-acre parcel.

- The Official Map of the County of Stanislaus, California (1908) shows the project area in the E ½ of the SW ¼ of the SW ¼ of Section 6 as parcels 69 and 74 of the Elmwood tract.

- The 1916 edition of the Denair USGS quadrangle shows one building within the project area that would be 105 years in age or older. The 1953 edition of the Denair quadrangle references the 1916-era building, as well as an additional building that would be 68 years in age (or older). We have no further information on file regarding these possible historical resources.

Prehistoric or historic resources within the immediate vicinity of the project area: None has been formally reported to the Information Center. We must caution that there has been very little archaeological/historical research conducted on private parcels within this portion of Stanislaus County.

Resources that are known to have value to local cultural groups: None has been formally reported to the Information Center.

Previous investigations within the project area: None has been formally reported to the Information Center.

Recommendations/Comments: Please be advised that a historical resource is defined as a building, structure, object, prehistoric or historic archaeological site, or district possessing physical evidence of human activities over 45 years old. Since the project area has not been subject to previous investigations, there may be unidentified features involved in your project that are 45 years or older and considered as historical resources requiring further study and evaluation by a qualified professional of the appropriate discipline.

Although the project area has been under cultivation, this does not preclude the possible discovery of subsurface remains below the plow zone. Instances of such inadvertent discoveries have occurred elsewhere in Stanislaus County.

If the current project does not include ground disturbance, further study for archaeological resources is not recommended at this time. If ground disturbance is considered a part of the current project, we recommend further review for the possibility of identifying prehistoric or historic-era archaeological resources.

If the proposed project contains buildings or structures that meet the minimum age requirement (45 years in age or older) it is recommended that the resource/s be assessed by a professional familiar with architecture and history of the county. Review of the available historic building/structure data has included only those sources listed above and should not be considered comprehensive.

If at any time you might require the services of a qualified professional the Statewide Referral List for Historical Resources Consultants is posted for your use on the internet at http://chrisinfo.org

If archaeological resources are encountered during project-related activities, work should be temporarily halted in the vicinity of the discovered materials and workers should avoid altering the materials and their context until a qualified professional archaeologist has evaluated the situation and provided appropriate recommendations. Project personnel should not collect cultural resources.

If human remains are discovered, California Health and Safety Code Section 7050.5 requires you to protect the discovery and notify the county coroner, who will determine if the find is Native American. If the remains are recognized as Native American, the coroner shall then notify the Native American Heritage Commission (NAHC). California Public Resources Code Section 5097.98 authorizes the NAHC to appoint a Most Likely Descendant (MLD) who will make recommendations for the treatment of the discovery.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the State Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

The California Office of Historic Preservation (OHP) contracts with the California Historical Resources Information System's (CHRIS) regional Information Centers (ICs) to maintain information in the CHRIS inventory and make it available to local, state, and federal agencies, cultural resource professionals, Native American tribes, researchers, and the public. Recommendations made by IC coordinators or their staff regarding the interpretation and application of this information are advisory only. Such recommendations do not necessarily represent the evaluation or opinion of the State Historic Preservation Officer in carrying out the OHP's regulatory authority under federal and state law.

We thank you for contacting this office regarding historical resource preservation. Please let us know when we can be of further service. Thank you for completing the **Access Agreement Short Form.**

Note: Billing will be transmitted separately via email from the Financial Services office ($150.00), payable within 60 days of receipt of the invoice.

If you wish to include payment by Credit Card, you must wait to receive the official invoice

from Financial Services so that you can reference the CMP # (Invoice Number), and then contact the link below:

https://commerce.cashnet.com/ANTHROPOLOGY

Sincerely,

E. A. Greathouse

E. A. Greathouse, Coordinator
Central California Information Center
California Historical Resources Information System

* Invoice Request sent to: ARBilling@csustan.edu, CSU Stanislaus Financial Services