Vineyards at Sand Creek

SCH#2014092010

Draft
Environmental Impact Report

Volume I of II

Prepared for
The City of Antioch

June 2015

Prepared by

RANEY
1501 Sports Drive, Suite A, Sacramento, CA 95834

Draft Environmental Impact Report
Vineyards at Sand Creek Project

SCH # 2014092010

Lead Agency:

City of Antioch
P.O. Box 5007
Antioch, CA 94531

Prepared By:

Raney Planning and Management, Inc.
1501 Sports Drive, Suite A
Sacramento, CA 95834
(916) 372-6100

Contact:
Cindy Gnos, AICP
Senior Vice President

Nick Pappani
Vice President

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1. INTRODUCTION

1 INTRODUCTION

1.1 INTRODUCTION

The Vineyards at Sand Creek Project (proposed project) Environmental Impact Report (EIR) has been prepared in accordance with the California Environmental Quality Act of 1970, Pub. Res. Code § 21000 et seq., as amended (CEQA) and the Guidelines for Implementation of the California Environmental Quality Act, Cal. Code Regs. Title 14, § 15000 et seq. (CEQA Guidelines). The City of Antioch is the lead agency for the environmental review of the proposed project evaluated herein and has the principal responsibility for approving the project. As required by Section 15121 of the CEQA Guidelines, this EIR will (a) inform public agency decision-makers, and the public generally, of the significant environmental effects of the project, (b) identify possible ways to minimize the significant adverse environmental effects, and (c) describe reasonable project alternatives. The public agency shall consider the information in the EIR along with other information that may be presented to the agency.

1.2 PROJECT DESCRIPTION

This section provides an overview of the project location and components. For additional project description details, please refer to Chapter 3, Project Description, of this EIR.

Project Location

The proposed project would be located within the City of Antioch, which is within eastern Contra Costa County, California. The project site is in the southeastern section of the City of Antioch, on the western side of State Route 4 (SR 4). The project site is within the northeastern corner of the Sand Creek Focus Area of the General Plan, which contains lands designated by the Antioch General Plan for open space, residential, business park, commercial, and mixed-use development. The project site is bounded by a residential subdivision to the north, Sand Creek to the south, Heidorn Ranch Road and City of Brentwood City limits to the east, and future Hillcrest Avenue extension and vacant residential land to the west.

Project Components

The proposed project consists of a residential development on 141.6 total acres, including up to 650 single-family residential units on 127.5 acres; 31.6 acres of parks and landscaped areas (some of which overlap with the residential area); extension of Heidorn Ranch Road, Hillcrest Avenue, and Sand Creek Road; extension of a portion of the Sand Creek Trail for connection to other City and regional trails; and utility improvements. In addition, the proposed project would construct off-site improvements (i.e., roadways and utilities) that would affect two adjacent off-site areas totaling approximately 6.47 acres: an area to the north and east that includes an approximately 6.02-acre portion of Heidorn Ranch Road (a dedicated public roadway in

Antioch); and a 0.4 acre area to the southeast that includes a portion of Sand Creek in which storm drain lines and a storm drain outfall structure would be constructed. The proposed project would be constructed in two main phases arranged into six neighborhoods. In addition, the project would include the construction of a detention basin south of the residential area and extension of the Sand Creek Trail, with the remaining acreage as undeveloped open space adjacent to Sand Creek. On-site infrastructure for the project would consist of subdivision roads, including curbs, gutters, and sidewalks, and water, sewer, and storm drainage connections and improvements.

The project applicant is seeking approval of the following by the City of Antioch at this time: a General Plan Amendment of the Sand Creek Focus Area of the General Plan from Business Park, Public/Quasi-Public, and Open Space/Senior Housing designations to Medium Low Density Residential; a Resource Management Plan; a Master Development Plan, Final Development Plan, and Planned Development Rezone; Tentative Map; and a Development Agreement.

1.3 PURPOSE OF THE EIR

As provided in CEQA Guidelines Section 15021, public agencies are charged with the duty to avoid or minimize environmental damage where feasible. The public agency has an obligation to balance a variety of public objectives, including economic, environmental, and social factors.

CEQA requires the preparation of an EIR prior to approving any project that may have a significant effect on the environment. For the purposes of CEQA, the term *project* refers to the whole of an action that has the potential for resulting in a direct physical change or a reasonably foreseeable indirect physical change in the environment (CEQA Guidelines Section 15378[a]). With respect to the proposed project, the City has determined that the proposed development is a project that has the potential for resulting in significant environmental effects within the definition of CEQA.

The EIR is an informational document that apprises decision makers and the general public of the potential significant environmental effects of a proposed project. An EIR must describe a reasonable range of potentially feasible alternatives to the project and identify feasible measures to minimize any significant effects. The lead agency, which is the City of Antioch for this project, is required to consider the information in the EIR in deciding whether to approve or deny the application. The basic requirements for an EIR include discussions of the environmental setting, environmental impacts, mitigation measures, alternatives, growth inducing impacts, and cumulative impacts.

1.4 EIR PROCESS

The EIR process begins with the decision by the lead agency to prepare an EIR, either during a preliminary review of a project or at the conclusion of an Initial Study. Once the decision is made to prepare an EIR, the lead agency sends a Notice of Preparation (NOP) to appropriate government agencies and, when required, to the State Clearinghouse (SCH) in the Office of Planning and Research (OPR), which will ensure that responsible and trustee State agencies reply within the required time. The SCH assigns an identification number to the project, which

then becomes the identification number for all subsequent environmental documents on the project. Commenting agencies have 30 days to respond to the NOP and provide information regarding alternatives and mitigation measures they wish to have explored in the EIR and to provide notification regarding whether the agency will be a responsible agency or a trustee agency for the project. An NOP (see Appendix A) was prepared for the proposed project and was circulated from September 9, 2014 to October 9, 2014. A public scoping meeting was held on September 17, 2014 for the purpose of informing the public and receiving comments on the scope of the environmental analysis to be prepared for the proposed project. See Section 1.6 below for a summary of comments received on the NOP.

As soon as the Draft EIR is completed, a notice of completion will be filed with the SCH and a public notice of availability will be published to inform interested parties that a Draft EIR is available for agency and public review. In addition, the notice provides information regarding the location of copies of the Draft EIR available for public review and any public meetings or hearings that are scheduled. The Draft EIR will be circulated for a period of 45 days, during which time reviewers may make comments. The lead agency must respond to comments in writing, describing the disposition of any significant environmental issues raised and explaining in detail the reasons for not accepting any specific comments concerning major environmental issues. If significant new information, as defined in CEQA Guidelines Section 15088.5, is added to an EIR after public notice of availability is given but before certification of the EIR, the revised EIR or affected chapters must be recirculated for an additional public review period with related comments and responses.

A Final EIR will be prepared, containing the Draft EIR or a revision thereof as well as comments and responses to comments on the Draft EIR. Before approving a project, the lead agency shall certify that the Final EIR has been completed in compliance with CEQA, and that the Final EIR has been presented to the decision-making body of the lead agency, which has reviewed and considered the EIR. The lead agency shall also certify that the Final EIR reflects the lead agency's independent judgment and analysis.

The findings prepared by the lead agency must be based on substantial evidence in the administrative record. If the decision-making body elects to proceed with a project that would have unavoidable significant impacts, then a Statement of Overriding Considerations explaining the decision to balance the benefits of the project against unavoidable environmental impacts must be prepared.

1.5 SCOPE OF THE EIR

This EIR constitutes a project-level analysis, and pursuant to CEQA Guidelines Section 15161, covers "all phases of the project including planning, construction, and operation." State CEQA Guidelines Section 15126.2(a) states, in pertinent part:

> An EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the

notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced.

Pursuant to these guidelines, the scope of this EIR addresses specific issues and concerns identified as potentially significant in the NOP prepared for the proposed project (see Appendix A). The City determined that the following issues will be addressed in the EIR:

- Aesthetics;
- Air Quality and Greenhouse Gas Emissions;
- Biological Resources:
- Cultural Resources;
- Geology, Soils, and Mineral Resources;
- Hazards and Hazardous Materials;
- Hydrology and Water Quality;
- Land Use and Planning / Agricultural Resources;
- Noise;
- Public Services, Recreation, and Utilities; and
- Transportation and Circulation.

The evaluation of effects is presented on a resource-by-resource basis in Chapters 4.1 through 4.11 of the EIR. Each technical chapter is divided into four sections: Introduction, Existing Environmental Setting, Regulatory Context, and Impacts and Mitigation Measures.

Impacts that are determined to be significant in Chapter 4, and for which feasible mitigation measures are not available to reduce those impacts to a less-than-significant level, are identified as *significant and unavoidable*. Chapter 5 of the EIR presents a discussion of growth-inducing impacts, summary of cumulative impacts, energy conservation, and significant irreversible environmental changes associated with the project.

1.6 COMMENTS RECEIVED ON THE NOP

The City of Antioch received four comment letters (see Appendix B) during the open comment period on the NOP for the proposed project. The letters were authored by the following representatives of State, regional, and local agencies and organizations:

- Cleak, Trevor – Central Valley Regional Water Quality Control Board;
- Galvan, Juan Pablo – Save Mount Diablo;
- Quinn, Meghan – Adams Broadwell Joseph & Cardozo; and
- Wilson, Scott – California Department of Fish and Wildlife.

The following list, categorized by issue, summarizes the concerns:

Biological Resources (*c.f.* Chapter 4.3)	Concerns related to: • The presence of listed rare, threatened, endangered, locally unique, and special-status species. • Potential impacts to wildlife habitat. • Project consistency with the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan.
Hazards and Hazardous Materials (*c.f.* Chapter 4.6)	Concerns related to: • Potential impacts related to the previous oil and gas uses on the site.
Hydrology and Water Quality (*c.f.* Chapter 4.7)	Concerns related to: • Potential impacts to river, streams, or wetlands, including Sand Creek.
Land Use and Planning / Agricultural Resources (*c.f.* Chapter 4.8)	Concerns related to: • Potential growth-inducing impacts. • Potential impacts to the jobs-housing balance in Antioch and east Contra Costa County.
Public Services, Recreation, and Utilities (*c.f.* Chapter 4.10)	Concerns related to: • Surface water runoff and impacts to drainage facilities and water quality. • Potential impacts on City surface water supplies.
Transportation and Circulation (c.f. Chapter 4.11)	Concerns related to: • Potential impacts to bicycle and pedestrian mobility and connectivity to nearby trails. • Individual and cumulative potential impacts to roadway intersections and segments of SR 4.

All of these issues are addressed in this EIR, in the relevant chapters identified in the first column.

1.7 ORGANIZATION OF THE EIR

The EIR for the proposed project is organized into the following chapters:

Chapter 1 – Introduction
Provides an introduction and overview describing the intended use of the EIR and the review and certification process, as well as summaries of the chapters included in the EIR and summaries of the issues and concerns received from the public and public agencies during the NOP review period.

Chapter 2 – Executive Summary
Summarizes the elements of the project and the environmental impacts that would result from implementation of the proposed project, describes proposed mitigation measures, and indicates

the level of significance of impacts after mitigation. Acknowledges alternatives that could reduce or avoid significant impacts.

Chapter 3 – Project Description
Provides a detailed description of the proposed project, including the project's location, background information, major objectives, and technical characteristics.

Chapter 4 – Existing Environmental Setting, Impacts, and Mitigation
Contains a project-level and cumulative analysis of environmental issue areas associated with the proposed project. Each environmental issue chapter contains an introduction and description of the project setting, identifies impacts, and recommends appropriate mitigation measures, if needed.

Chapter 5 – Statutorily Required Sections
Provides discussions required by CEQA regarding impacts that would result from the proposed project, including a summary of cumulative impacts, potential growth-inducing impacts, significant and unavoidable impacts, and significant irreversible changes to the environment.

Chapter 6 – Alternatives Analysis
Describes the alternatives to the proposed project, their respective environmental effects, and a determination of the environmentally superior alternative.

Chapter 7 – References
Provides bibliographic information for all references and resources cited.

Chapter 8 – EIR Authors and Persons Consulted
Lists EIR and technical report authors who provided technical assistance in the preparation and review of the Draft EIR.

Appendices
Includes the NOP, comments received during the NOP comment period, and all technical reports prepared for the proposed project.

2. EXECUTIVE SUMMARY

2 EXECUTIVE SUMMARY

2.1 INTRODUCTION

The Executive Summary chapter of the EIR provides an overview of the Vineyards at Sand Creek Project (proposed project) and summarizes the conclusions of the environmental analysis provided in Chapters 4.1 through 4.11. The chapter also reviews the alternatives to the proposed project that are described in the Alternatives Analysis chapter, and identifies the Environmentally Superior Alternative. Table 2-1, found at the end of this chapter, provides a summary of the environmental effects of the proposed project, as identified in each technical chapter of the EIR. Table 2-1 also contains the potential environmental impacts associated with the proposed project, the significance of the impacts, the proposed mitigation measures for the impacts, and the significance of the impacts after implementation of the mitigation measures.

2.2 PROJECT LOCATION AND DESCRIPTION

The proposed project would be located within the City of Antioch, which is within eastern Contra Costa County, California. The project site is in the southeastern section of the City of Antioch, on the western side of State Route 4 (SR 4). The project site is within the northeastern corner of the Sand Creek Focus Area of the General Plan, which contains lands designated by the Antioch General Plan for open space, residential, business park, commercial, and mixed-use development. The project site is bounded by a residential subdivision to the north, Sand Creek to the south, Heidorn Ranch Road and City of Brentwood City limits to the east, and future Hillcrest Avenue extension and vacant residential land to the west.

The proposed project consists of a residential development on 141.6 total acres, including up to 650 single-family residential units on 127.5 acres; 31.6 acres of parks and landscaped areas (some of which overlap with the residential areas); extension of Heidorn Ranch Road, Hillcrest Avenue, and Sand Creek Road; extension of a portion of the Sand Creek Trail for connection to other City and regional trails; and utility improvements. In addition, the proposed project would construct off-site improvements (i.e., roadways and utilities) that would affect two adjacent off-site areas totaling approximately 6.47 acres: an area to the north and east that includes an approximately 6.02-acre portion of Heidorn Ranch Road (a dedicated public roadway in Antioch); and a 0.4 acre area to the southeast that includes a portion of Sand Creek in which storm drain lines and a storm drain outfall structure would be constructed. The proposed projectwould be constructed in two main phases arranged into six neighborhoods. In addition, the project would include the construction of a detention basin south of the residential area and extension of the Sand Creek Trail, with the remaining acreage as undeveloped open space adjacent to the Sand Creek buffer area.

The project applicant is seeking approval of the following by the City of Antioch at this time: a General Plan Amendment of the Sand Creek Focus Area of the General Plan from Business Park,

Public/Quasi-Public, and Open Space/Senior Housing designations to Medium Low Density Residential; a Resource Management Plan; a Master Development Plan, Final Development Plan, and Planned Development Rezone; Tentative Map; and a Development Agreement.

Surrounding Land Uses

The existing land uses surrounding the proposed project site are as follows:

- North: Single-Family Residential
- South: Sand Creek and Undeveloped Farm Land
- East: Undeveloped Land
- West: Undeveloped Land

2.3 ENVIRONMENTAL IMPACTS AND REQUIRED MITIGATION

Under the California Environmental Quality Act (CEQA), a significant effect on the environment is defined as a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, mineral, flora, fauna, ambient noise, and objects of historic or aesthetic significance. Implementation of the proposed project could result in significant impacts on the resource areas listed below.

This EIR discusses mitigation measures that could be implemented by the City to reduce potential adverse impacts to a less-than-significant level. Such mitigation measures are noted in this EIR and are found in the following chapters: Aesthetics, Air Quality and Greenhouse Gas Emissions, Biological Resources, Cultural Resources, Geology, Soils, and Mineral Resources, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning / Agricultural Resources, Noise, Public Services, Recreation, and Utilities, and Transportation and Circulation. If an impact is determined to be significant or potentially significant, applicable mitigation measures are identified, as appropriate. These mitigation measures are also summarized in Table 2-1, at the end of this chapter. The mitigation measures presented in the EIR will form the basis of the Mitigation Monitoring and Reporting Program. Any impact that remains significant after implementation of mitigation measures is considered a significant and unavoidable impact.

Aesthetics

The Aesthetics chapter of the Draft EIR describes the existing visual resources of the proposed project site and vicinity. The California Environmental Quality Act (CEQA) describes the concept of aesthetic resources in terms of scenic vistas, scenic resources (such as trees, rock outcroppings, and historic buildings within a State scenic highway), the existing visual character or quality of the project site, and light and glare impacts. The Aesthetics chapter's impact analysis is based on information drawn from the City of Antioch General Plan and associated EIR.

The Aesthetics chapter determined that impacts related to adverse effects on scenic vistas, degradation of the existing visual quality of the project site, and cumulative impacts to the visual

character of the region in combination with future buildout in the City of Antioch from the proposed project would be less-than significant. Additionally, the proposed project would have no impact related to substantially damaging scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway. Furthermore, impacts related to the creation of new sources of substantial light or glare that would adversely affect day or nighttime views in the area were found to be potentially significant but would be reduced to a less-than-significant level with implementation of mitigation measures included in the Draft EIR.

Air Quality and Greenhouse Gas

The Air Quality and Greenhouse Gas chapter of this EIR describes the effects of the proposed project on local and regional air quality. The chapter includes a discussion of the existing air quality and greenhouse gas (GHG) setting, construction-related air quality impacts resulting from grading and equipment emissions, direct and indirect emissions associated with the project, the impacts of these emissions on both a local and regional scale, and mitigation measures warranted to reduce or eliminate any identified significant impacts. The chapter utilizes information obtained from the City of Antioch General Plan and the California Emissions Estimator Model version 2013.2.2.

The Air Quality and Greenhouse Gas chapter determined that the following impacts were identified as less than significant: the exposure of sensitive receptors or the general public to substantial levels of pollutant concentrations, the creation of objectionable odors affecting a substantial number of people, and the generation of long-term operational criteria air pollutant emissions. In addition, the Air Quality and Greenhouse Gas chapter determined that the project's contribution to impacts related to the generation of cumulative criteria air pollutant emissions and GHG emissions would be less than significant. Furthermore, impacts related to the generation of short-term construction-related criteria air pollutant emissions would be potentially significant; however, with implementation of the required mitigation measures, the impact would be reduced to a less-than-significant level.

Biological Resources

The Biological Resources chapter evaluates the biological resources known to occur or potentially occur within the proposed project site. The Biological Resources chapter describes potential impacts to those resources, and identifies measures to eliminate or substantially reduce those impacts to less-than-significant levels. Information presented in this chapter is primarily drawn from the Biological Resources Assessment prepared by Monk & Associates (see Appendix D), the Tree Survey prepared by Stewart's Tree Service, Inc. (see Appendix G), the City of Antioch General Plan, and the associated EIR. Existing plant communities, wetlands, wildlife habitats, and potential for special-status species and communities are discussed for the project area.

The Biological Resources chapter concluded that impacts related to special-status plants, wildlife corridors, and the Habitat Conservation Plan would be less than significant. In addition, the following impacts were identified as potentially significant: impacts to the California red-legged frog, western pond turtle, western burrowing owl, Swainson's hawk, nesting raptors, nesting

special-status bird species and nesting common bird species, San Joaquin kit fox, Waters of the United States and/or State, Department of Fish and Wildlife Fish and Game Code Section 1602 jurisdictional areas, and protected trees under the City of Antioch's Tree Preservation and Regulation Ordinance. However, with implementation of mitigation measures, the above impacts would be reduced to a less-than-significant level. Furthermore, the project's contributions to cumulative impacts associated with the loss of biological resources and the effects of ongoing urbanization in the region were determined to be less than significant with the implementation of mitigation.

Cultural Resources

The Cultural Resources chapter of this EIR addresses known historic and prehistoric resources in the project vicinity and the potential for unknown resources to exist, analyzes the possible impacts associated with the project, and identifies mitigation measures that would be necessary to reduce impacts to a less-than-significant level. The Cultural Resources chapter is primarily based on information drawn from the following sources: the City of Antioch General Plan and associated EIR, and the Cultural Resources Assessment performed for the proposed project by Ric Windmiller, Consulting Archaeologist.

The Cultural Resources chapter determined that impacts related to historic cultural resources would be considered less than significant. In addition, impacts related to archeological or paleontological resources and human remains would be potentially significant; however, with implementation of the required mitigation measures, the impact would be reduced to a less-than-significant level. In addition, impacts associated with the project's contribution to the cumulative loss of cultural resources were determined to be less than significant.

Geology, Soils, and Mineral Resources

The Geology, Soils, and Mineral Resources chapter describes the geologic and soil characteristics of the proposed project and evaluates the extent to which implementation of the proposed project could expose people and structures to seismic hazards such as rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, landslides, soil erosion, soil stability and expansive soil characteristics. The chapter also addresses mineral resources. The Geology, Soils, and Mineral Resources chapter is primarily based on information drawn from the City of Antioch General Plan and the associated EIR, the two geotechnical reports prepared for the project site by ENGEO, Inc., and the peer review of the geotechnical reports.

The Geology, Soils, and Mineral Resources chapter determined that impacts related to risks to people and structures associated with seismic activity and expansive soils, and risks associated with substantial erosion nor loss of topsoil would be potentially significant; however, with implementation of the required mitigation measures, the impacts would be reduced to less-than-significant levels. Impacts related to a loss of availability of a known mineral resource that would be of value to the region and the residents of the State or of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan were

determined to be less than significant. In addition, the proposed project would have a less-than-significant contribution to cumulative impacts related to geology, soils, and mineral resources.

Hazards and Hazardous Materials

The Hazards and Hazardous Materials chapter of this EIR describes existing and potentially occurring hazards and hazardous materials within the proposed project area. The Hazards and Hazardous Materials chapter discusses potential impacts posed by these hazards to the environment, as well as to workers, visitors, and residents within and adjacent to the project area. The Hazards and Hazardous Materials chapter is primarily based on information drawn from the following sources: the City of Antioch General Plan and associated EIR and the Phase I Environmental Site Assessment prepared for the project site by ENGEO, Inc. (see Appendix J).

The Hazards and Hazardous Materials chapter concluded that following impacts would be less than significant: impacts related to the routine transport, use, or disposal of hazardous materials; emitting or handling hazardous materials within one-quarter mile of a school; wildland fires; or cumulative increase in the number of people who could be exposed to potential hazards associated with potentially contaminated soil and groundwater and an increase in the transport, storage, and use of hazardous materials from development of the proposed project in combination with other reasonable foreseeable projects in the region. In addition, the project site would have no impact to the following: being located on a site included on a list of hazardous materials sites; interfering with an adopted emergency response plan or emergency evacuation plan; or being a safety hazard associated with an airport or private airstrip. Furthermore, the potential impacts related to the accidental release of hazardous materials into the environment, were deemed as potentially significant but could be reduced to a less-than-significant level with implementation of mitigation measures included in the EIR.

Hydrology and Water Quality

The Hydrology and Water Quality chapter of the EIR describes existing drainage and water resources for the project site, and evaluates potential impacts of the Vineyards at Sand Creek Project (proposed project) with respect to flooding, surface water resources, and groundwater resources. Information for the Hydrology and Water Quality chapter was primarily drawn from the City of Antioch General Plan and associated EIR and the *Preliminary Stormwater Control Plan* prepared for the proposed project by Balance Hydrologics, Inc. (see Appendix L).

The Hydrology and Water Quality chapter identified the following impacts to be less than significant: impacts related to substantially altering the existing drainage pattern and surface runoff; violating water quality standards or otherwise substantially degrading water quality during construction or operations; depleting groundwater supplies or interfering substantially with groundwater recharge; placing housing or structures within a 100-year flood hazard area; or exposing people or structures to significant risk as a result of the failure of a levee or dam. In addition, impacts from the project to cumulative hydrology and water quality impacts were determined to be less than significant. Furthermore, the project site would result in no impact by inundation by seiche, tsunami, or mudflow.

Land Use and Planning / Agricultural Resources

The Land Use and Planning / Agricultural Resources chapter discussions include a description of the existing land use setting of the project site and the adjacent area, including the identification of existing land uses and current General Plan policies and zoning designations, as well as population and housing, and agricultural resources impacts.

The Land Use and Planning / Agricultural Resources chapter identified the following impacts as less than significant as a result of the implementation of the proposed project: physical division of an established community; compatibility with surrounding uses; consistency with the Antioch General Plan; consistency with existing zoning; substantial population growth; displacement of existing housing or people; contribution to cumulative impacts related to land use and planning / agricultural resources incompatibilities; cumulative loss of agricultural land; and cumulative population and housing. In addition, the project would have no impact to the following: conversion of Farmland, conflict with agricultural zoning or a Williamson Act contract; and forest land or timberland zoning.

Noise

The Noise chapter of this EIR discusses the existing noise environment in the immediate project vicinity and identifies potential noise-related impacts associated with the proposed project. Specifically, this chapter analyzes potential noise impacts due to and upon development within the project site relative to applicable noise criteria and to the existing ambient noise environment. Information for this chapter was primarily drawn from the City of Antioch General Plan and the Environmental Noise Assessment prepared for the project site by j.c. brennan & associates, Inc. (see Appendix N).

The proposed project would have no impact related to aircraft noise and vibration. The Noise chapter determined that impacts related to construction noise and vibration to existing sensitive receptors and transportation noise at new sensitive receptors would be potentially significant; however, with implementation of the required mitigation measures, the impacts would be reduced to a less-than-significant level. In addition, impacts associated with transportation noise at existing sensitive receptors, and operational noise from activities on site post development were determined to be less than significant. Furthermore, the project's contribution to cumulative impacts on noise-sensitive receptors would be potentially significant; however, with implementation of the required mitigation measures, the impact would be reduced to a less-than-significant level.

Public Services, Recreation, and Utilities

The Public Services, Recreation, and Utilities chapter of this EIR describes the public service systems and facilities within the project area and the associated potential impacts resulting from the proposed project. Public services and utilities addressed in the chapter include the water system, wastewater conveyance and treatment, solid waste, fire protection facilities, law enforcement services, library facilities, schools, parks and recreation facilities, and gas and electricity.

The Public Services, Recreation, and Utilities chapter concluded that the impacts related to water supply, wastewater services, solid waste services, fire protection and emergency medical services, law enforcement and protection services, school capacities, library services, and electricity and natural gas services, would be less than significant. However, impacts related to parks and recreation facilities were identified as potentially significant, but impacts would be reduced to a less-than-significant level with the implementation of mitigation measures included in the EIR. In addition, the Public Services, Recreation, and Utilities chapter analyzed cumulative impacts associated with the development of the proposed project, in combination with future buildout in the City of Antioch, and determined that the project's contribution to increases in demand for additional public services and utilities would be less-than-significant.

Transportation and Circulation

The Transportation and Circulation chapter of the EIR discusses the existing and near-term transportation and circulation conditions associated with the proposed project. The information contained within this chapter is primarily based on the Transportation Impact Assessment prepared for the proposed project by Fehr & Peers (see Appendix O). The analysis includes consideration of automobile traffic impacts on roadway capacity, circulation, transit, and bicycle and pedestrian facilities.

The Transportation and Circulation chapter identified the following impacts as less than significant as a result of the implementation of the proposed project: study roadway intersections and freeway facilities under Existing and Cumulative Plus Project conditions; alternative transportation facilities; study roadway intersections under Near-Term Plus Project conditions; and, alternative transportation facilities under Cumulative Plus Project conditions. In addition, impacts associated with traffic related to construction activities and short-term impacts related to construction activities and study roadway intersections and freeway facilities under cumulative plus project conditions were identified as potentially significant but could be reduced to a less-than-significant level with implementation of mitigation measures in the EIR.

2.4 SUMMARY OF PROJECT ALTERNATIVES

The following section presents a summary of the evaluation of the alternatives considered for the proposed project, which include the:

- No Project (No Build) Alternative;
- Buildout Pursuant to Existing General Plan Alternative; and
- Executive Residential Alternative.

No Project (No Build) Alternative

CEQA requires the evaluation of the comparative impacts of the "No Project Alternative" (CEQA Guidelines Section 15126.6(e)). The No Project Alternative may be defined either as the "no action taken on the proposed project" or a "no build" on the project site. The No Project (No Build) Alternative is defined as the continuation of the existing conditions of the project site, which is currently disturbed, vacant, agricultural land. The No Project (No Build) Alternative

would not meet any of the project objectives. Because development of the site would not occur, land disturbance and any associated physical environmental impacts would not occur as a result of the No Project (No Build) Alternative.

The Alternatives Analysis chapter of this EIR identified that the No Project (No Build) Alternative could result in greater impacts than the proposed project related to Land Use and Planning / Agricultural Resources. However, no impacts would occur under the No Project (No Build) Alternative in all other resource areas.

Buildout Pursuant to Existing General Plan Alternative

The Buildout Pursuant to Existing General Plan Alternative would achieve few of the proposed project's objectives. The Buildout Pursuant to Existing General Plan Alternative would include the development of 16 two-story office buildings on 131 acres of the 141.6-acre project site for a total of 2,600,000 sf. The Buildout Pursuant to Existing General Plan Alternative would eliminate the single-family housing units and would include a 2.77-acre park in the center of the site. The buildings and streets would be laid out in a grid-style with predominantly east-west building orientations. Building sizes would average 150,000 sf and would range from 60,000 sf to 280,000 sf. Under the Buildout Pursuant to Existing General Plan Alternative, the centrally-located park parcel would be increased from 2.1 acres to 2.77 acres and the water quality detention basin would remain unchanged. Overall, the Buildout Pursuant to Existing General Plan Alternative would eliminate the residential units and introduce business park uses to the site.

The Buildout Pursuant to Existing General Plan Alternative would result in fewer impacts than the proposed project in one resource areas (Land Use and Planning / Agricultural Resources), equal impacts in seven resource areas (Aesthetics; Biological Resources; Cultural Resources; Geology, Soils, and Mineral Resources; Hazards and Hazardous Materials; Hydrology and Water Quality; and Public Services, Recreation, and Utilities), and greater impacts in three resources areas (Air Quality and GHG Emissions; Noise; and Transportation and Circulation).

Executive Residential Alternative

The Executive Residential Alternative would achieve some of the proposed project's objectives. The Executive Residential Alternative would include the construction of 232 large-lot single family residences on 131 acres. The Executive Residential Alternative would reduce the total number of dwelling units from 650 to 232, a reduction of approximately 64 percent. The Executive Residential Alternative would incorporate two parks on the project site.

The Executive Residential Alternative would result in fewer impacts than the proposed project in seven resource areas (Air Quality and GHG Emissions; Geology, Soils, and Mineral Resources; Hydrology and Water Quality; Land Use and Planning / Agricultural Resources; Noise; Public Services, Recreation, and Utilities; and Transportation and Circulation) and equal impacts in four resource areas (Aesthetics; Biological Resources; Cultural Resources; and Hazards and Hazardous Materials). The Executive Residential Alternative would not result in greater impacts than the proposed project in any resource area.

Environmentally Superior Alternative

An EIR is required to identify the environmentally superior alternative from among the range of reasonable alternatives that are evaluated. Section 15126(e)(2) of the CEQA Guidelines requires that an environmentally superior alternative be designated and states, "If the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." Generally, the environmentally superior alternative is the one that would result in the fewest environmental impacts as a result of project implementation.

Aside from the No Project Alternative, the development alternatives would meet some of the proposed project's objectives. However, because the Buildout Pursuant to Existing General Plan Alternative would not involve residential development, the Alternative would meet fewer of the project objectives than the Executive Residential Alternative. A comparison of the proposed project to the three aforementioned alternatives is illustrated in the Alternatives Analysis chapter of this EIR. As discussed in the Alternatives Analysis chapter, because the Executive Residential Alternative would meet the most of the project objectives and would result in fewer impacts than the proposed project in the most resource areas, in comparison to the other development alternatives, the Executive Residential Alternative would be considered the Environmentally Superior Alternative.

2.5 SUMMARY OF IMPACTS AND MITIGATION MEASURES

A summary of the identified impacts in the technical chapters of the EIR is presented in Table 2-1. In Table 2-1, the proposed project impacts are identified for each chapter (Chapters 4.1 through 4.11) in the EIR. In addition, Table 2-1 includes the level of significance of each impact, any mitigation measures required for each impact, and the resulting level of significance after implementation of mitigation measures for each impact.

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
4.1 Aesthetics			
4.1-1 Substantial adverse effect on a scenic vista.	LS	*None required.*	N/A
4.1-2 Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building within a State scenic highway.	NI	*None required.*	N/A
4.1-3 Degradation of the existing visual character or quality of the project site and/or the site's surroundings.	LS	*None required.*	N/A
4.1-4 Creation of new sources of substantial light or glare that would adversely affect day or nighttime views in the area.	PS	*4.1-4 Prior to approval of Improvement Plans that include street lights, the City of Antioch's Engineering Division shall review and approve the lighting specifications to ensure that lighting fixtures comply with the Zoning Code's requirements for minimum and maximum ground level illumination. In addition, prior to approval of building permits for new structures that include exterior lighting, the City of Antioch's Planning Division shall review and approve the exterior lighting specifications to ensure exterior lighting is of a low profile and intensity.*	LS

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
4.1-5 Long-term changes in visual character of the region associated with cumulative development of the proposed project in combination with future buildout in the City of Antioch.	LS	*None required.*	N/A
4.2 Air Quality and GHG Emissions			
4.2-1 Generation of short-term construction-related criteria air pollutant emissions.	PS	*4.2-1 Prior to issuance of a grading permit, the project applicant shall show on the grading plans via notation that the contractor shall ensure that:* • *All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded are, and unpaved access roads) shall be watered two times per day.* • *All haul trucks transporting soil, sand, or other loose material off-site shall be covered.* • *All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day.* • *All vehicle speeds on unpaved roads shall be limited to 15 mph.* • *All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible*	LS

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		after grading unless seeding or soil binders are used. • *Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes. Clear signage shall be provided for construction visible emissions evaluator.* • *All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.* • *Post a publicly visible sign with the telephone number and person to contact at the City of Antioch regarding dust complaints. This person shall be respond and take corrective action within 48 hours. The Air District's phone number shall also visible to ensure compliance with applicable regulations.* • *All diesel-powered equipment larger than 200 horsepower (i.e., rubber tired dozers, scrapers, and cranes) and diesel-powered graders shall meet USEPA emissions standards for Tier 2 engines or equivalent.* *The grading plans shall be submitted for review and*	

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		approval by the City Engineer.	
4.2-2 Generation of long-term operational criteria air pollutant emissions and a conflict with or obstruction of implementation of regional air quality plans.	LS	*None required.*	N/A
4.2-3 Exposure of sensitive receptors or the general public to substantial levels of pollutant concentrations.	LS	*None required.*	N/A
4.2-4 Creation of objectionable odors affecting a substantial number of people.	LS	*None required.*	N/A
4.2-5 Generation of a cumulatively considerable contribution to criteria air pollutant emissions.	LS	*None required.*	N/A
4.2-6 Generation of a cumulatively considerable contribution to GHG emissions,	LS	*None required.*	N/A
4.3 Biological Resources			
4.3-1 Impacts to special-status plants.	LS	*None required.*	N/A
4.3-2 Impacts to the California red-legged frog.	PS	*4.3-2(a) Prior to the issuance of a grading permit for project site grading and the installation of the outfall structure in Sand Creek, an education program shall be conducted by a qualified biologist to explain the endangered species concerns to*	LS

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		contractors/operators working at the project site. This education/training program shall include a description of the frog and its habitat, a review of the Endangered Species Act and the federal listing of the frog, the general protection measures to be implemented to protect the frog and minimize take, and a delineation of the limits of the work area. *4.3-2(b) A qualified 10(a)(1)(A) biologist shall conduct preconstruction surveys of the creek work areas no more than 14 days prior to dewatering and other work activities. If any California red-legged frogs are identified in the work area, the Service and the Department shall be notified and, if permitted, relocated outside of the work area.* *4.3-2(c) The work areas adjacent to Sand Creek shall be isolated with suitable amphibian exclusion fencing (see below) that would block the movement of California red-legged frogs from entering the work areas. This fence shall be installed prior to the time any site grading or other construction-related activities are implemented. The fence shall remain in place during site grading or other construction-related activities and shall prevent frogs from entering the project site work areas.*	

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		While normally California red-legged frog exclusion fencing consists of silt fencing, owing to the duration of the development project, a more weather resilient fence is recommended. The exclusion fence shall consist of a 4-foot wall of ¼-inch mesh, galvanized wire (i.e., welded wire hardware cloth- no woven wire would be allowed) or other commercially available exclusion fencing (e.g. ERTEC Fence). Initially, staking would be installed along the route of the exclusion fencing in a 4 inch deep trench. Then, the bottom of the fence would be firmly seated in the trench. The fencing above the ground would be anchored to metal staking with wire. Finally, the top 10-inches or less would be bent over in a semi-circle towards the outside of the fence to ensure that the fence cannot be climbed. This fence would be expected to last the duration of the construction period for the development project. *4.3-2(d) A qualified biologist shall be onsite when grading activities occur within 300 feet of Sand Creek to conduct daily inspections of the fencing and to otherwise ensure that stranded animals are salvaged and relocated back to the stream channel. The biological monitor shall be responsible for ensuring*	

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		that the wildlife exclusion fencing is not compromised, and shall notify the onsite contractor representative when fencing needs to be repaired. *4.3-2(e) All construction work in Sand Creek associated with the outfall structure shall be scheduled for the dry season (May 15 through October 15) and when there is reduced flow in Sand Creek. No work shall occur when water is flowing within the work area. Any necessary in-drainage work when there are flows shall be isolated from flows via the installation of temporary coffer dams that have flow-through bypass pipes. Flows shall be diverted around isolated work areas either by gravity flow or if necessary by pumping water around the work area. No silty water shall be allowed to reenter the tributary below any in-drainage work area. Methods and materials shall be adapted in the field to match the size, shape, and anticipated flow volume of the drainage, and pre-approved by the biological monitor. All diversions shall conform to the following provisions:* • *Drainage diversion shall be practiced only where deemed unavoidable by the proposed project engineer and biological monitor.*	

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		• *Diversion shall be limited to the minimum time period necessary to complete the work and restore the channel.* • *Construction equipment would work from above the top-of-bank unless equipment is authorized to operate below the top-of-bank by the Department, Service, USACE, and/or RWQCB pertaining to their respective jurisdictions. Unless permitted by these agencies within their respective jurisdictions, there shall be no vehicle passage, vehicle parking, or materials storage below the top of bank.* • *All in-drainage and diversion work plans shall reflect and incorporate standard erosion control measures and BMP's as prescribed in the Project's SWPPP.* • *In certain cases where water seeps into the dewatered area, sump pits may be excavated in the work area and seepage water would then be pumped back upstream behind the coffer dam. All discharged water shall be silt free. If silt is a problem, water shall be pumped through a silt sock into baker tank(s) prior to discharge back into the channel.* • *All downstream flows shall be maintained throughout the period that coffer dams are*	

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		installed. • *The entire work area below the top of bank, including the coffer dam location, shall be restored to the approximate pre-construction contours and would be stabilized as necessary to withstand the expected high water flows. All dam materials shall be completely removed from the channel when work is complete, and not be disposed of in or near the channel.* • *A qualified 10(a)(1)(A) biologist shall conduct preconstruction surveys for California red-legged frog prior to isolating any work area within Sand Creek. If any frogs are found in the work area, the Service and the Department shall be notified, and the frogs shall be moved from the work area to up or downstream areas of Sand Creek, whichever is closest to the capture site. Upon completion of the survey, coffer dams may be installed. Any isolated water shall be seined by the proposed project biologist to search for frogs prior to pumping water out of the isolated work areas.* • *The project biological monitor shall be present during all in-drainage work. Dewatered work areas shall not result in stranded aquatic wildlife.*	

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		• *All trash that might attract predators to the project site shall be properly contained and removed from the site and disposed of regularly. All construction debris and trash shall be removed from the site when construction activities are complete.* • *All fueling and maintenance of equipment and vehicles, and staging areas shall be at least 20 meters from Sand Creek. The construction personnel shall ensure that contamination of California red-legged frog habitat does not occur and shall have a plan to promptly address any accidental spills.* *4.3-2(f) To mitigate for impacts to federally listed species, including impacts to the California red-legged frog, the applicant shall preserve 272 acres as offsite mitigation (hereinafter called the Marsh Creek Property) located off Marsh Creek Road in eastern Contra Costa County. An alternative mitigation property approved by the Service that possesses comparable biological resources for the affected federally listed species may also be used for mitigation in lieu of the Marsh Creek Property. The Marsh Creek Property is located immediately north of and adjacent to East Bay Regional Park District's*	

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		(EBRPD) Round Valley Regional Preserve. The geographic location of the Marsh Creek Property adjacent to EBRPD Round Valley Regional Park makes it a valuable preservation property that would add permanently preserved acreage to existing regionally significant preserved lands (Round Valley Regional Preserve). *There is a 1982 record for California red-legged frogs along Marsh Creek on the Marsh Creek Property (CNDDB Occurrence No. 546), and a total of 79 reported occurrences of California red-legged frogs within 5 miles of the property. Hence, the habitat to be preserved at this mitigation property supports grassland habitat that provides upland dispersal habitat and aquatic habitat for California red-legged frogs, and Marsh Creek provides potential breeding habitat for California red-legged frog. The combination of breeding habitat in proximity to suitable upland habitat is most important for the ongoing viability of the California red-legged frog populations.* *While the proposed project would not likely impact the California tiger salamander, preservation of the Marsh Creek Property shall nonetheless provide*	

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		benefits to this salamander. There is a 1982 record for California tiger salamander in a pond in annual grassland adjacent to Marsh Creek, located 0.24 mile upstream from the Marsh Creek Property (CNDDB Occurrence No. 170), and a total of 69 reported occurrences of California tiger salamanders within 5 miles of the Marsh Creek Property. Owing to the abundance of known California tiger salamander records in the vicinity of the Marsh Creek Property and the presence of a robust California ground squirrel colony within the grasslands on the property, which provide necessary refugia habitats for California tiger salamanders, the Marsh Creek Property would most likely be regarded by the U.S. Fish and Wildlife Service and the Department of Fish and Wildlife as supporting suitable upland over-summering habitat for this salamander. Therefore, the proposed mitigation site would provide appropriate mitigation for impacts to 141.6 acres of long-term disked agricultural land (has been farmed annually since at least 1945 based upon aerial photograph research completed by M&A). *4.3-2(g) The project proponent shall record a conservation easement over the Marsh Creek Property preserving*	

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		it in perpetuity as wildlife habitat. The easement shall be granted to a qualified conservation organization such as the EBRPD. The project proponent shall also establish an endowment fund to provide for the long-term management, maintenance, and monitoring of the mitigation site. A Resource Management Plan (RMP) shall be developed for the management of natural resources to be preserved on the Marsh Creek Property.	
4.3-3 Impacts to the western pond turtle.	PS	*4.3-3 A qualified biologist shall conduct a preconstruction survey of the work area in Sand Creek, and if a western pond turtle is identified in the work area, the turtle will be relocated to suitable habitat downstream. The work areas adjacent to Sand Creek shall be isolated with exclusion fencing that will prevent western pond turtle from entering the work site and accidentally being harmed by construction activities.* *The deeply incised channel with steep slopes makes it very unlikely that a western pond turtle would climb up onto the project site to nest. As such, no potential nesting sites are likely to be affected by the proposed project. Regardless, preconstruction surveys for turtle nest sites in uplands adjacent to suitable aquatic habitat during spring and summer*	LS

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		months shall be conducted within 30 days prior to beginning any activities. If no nests are found, no further consideration for western pond turtle nests is warranted. If nest sites are located during preconstruction surveys adjacent to a proposed work area, the nest site plus a 50-foot buffer around the nest site shall be fenced where it intersects a project work area to avoid impacts to the eggs or hatchlings which over-winter at the nest site. In addition, if nest(s) are located during surveys, moth balls (naphthalene) should be sprinkled around the vicinity of the nest (no closer than 10 feet) to mask human scent and discourage predators. *Construction at the nest site and within the 50-foot buffer area shall be delayed until the young leave the nest (this could be a period of many months) or as otherwise advised and directed by the Department, the agency responsible for overseeing the protection of the pond turtle. If the Department allows translocation of any nestling pond turtles this shall be completed by a qualified biologist under the direction of the Department.* *A 272 acre Mitigation Property shall be preserved along Marsh Creek Road in eastern Contra Costa*	

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		County (or an alternative mitigation property with comparable biological resource values may also be used for mitigation in lieu of the Marsh Creek Property) to compensate for project related impacts to the California red-legged frog and the San Joaquin kit fox (see mitigation measures for these two species). Marsh Creek runs west to east through the Marsh Creek Property. This creek supports optimal western pond turtle basking pools and supports suitable nesting habitat that can be used by the western pond turtle. Thus, the permanent preservation of the Marsh Creek Property required to compensate for project impacts to the California red-legged frog and the San Joaquin kit fox will also benefit the western pond turtle.	
4.3-4 Impacts to western burrowing owl.	PS	*4.3-4(a) Within 14 days of commencement of ground disturbance, burrowing owl surveys shall be conducted by walking the entire project site and (where possible) in areas within 150 meters (approx. 500 feet) of the proposed project impact zone. The 150-meter buffer zone is surveyed to identify burrows and owls outside of the proposed project area which may be impacted by factors such as noise and vibration (heavy equipment) during project construction.*	LS

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SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Pedestrian survey transects shall be spaced to allow 100 percent visual coverage of the ground surface. The distance between transect center lines shall be 7 meters to 20 meters and shall be reduced to account for differences in terrain, vegetation density, and ground surface visibility. Poor weather may affect the surveyor's ability to detect burrowing owls thus, avoid conducting surveys when wind speed is greater than 20 kilometers per hour and there is precipitation or dense fog. To avoid impacts to owls from surveyors, owls and/or occupied burrows shall be avoided by a minimum of 50 meters (approx. 160 ft.) wherever practical to avoid flushing occupied burrows. Disturbance to occupied burrows shall be avoided during all seasons. *4.3-4(b) If burrowing owls are detected on the site, the following restricted activity dates and setback distances are recommended per the Department's Staff Report (2012):* • *From April 1 through October 15, low disturbance and medium disturbance activities shall have a 200 meter buffer while high disturbance activities shall have a 500 meter buffer from occupied nests.*	

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		• *From October 16 through March 31, low disturbance activities shall have a 50 meter buffer, medium disturbance activities shall have a 100 meter buffer, and high disturbance activities shall have a 500 meter buffer from occupied nests.* • *No earth-moving activities or other disturbance shall occur within the aforementioned buffer zones of occupied burrows. These buffer zones shall be fenced as well. If burrowing owls were found in the proposed project area, a qualified biologist would also need to delineate the extent of burrowing owl habitat on the site.* *4.3-4(c) The proposed preservation of the Marsh Creek Mitigation Property shall preserve 272 acres that will benefit western burrowing owls. The permanent preservation of this mitigation land provides suitable mitigation for impacts that would occur to 141.6 acres of marginal western burrowing owl habitat. The Marsh Creek Property supports grassland habitat and a robust California ground squirrel population that provides suitable habitat for western burrowing owls.*	

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
4.3-5 Impacts to Swainson's hawk.	PS	*4.3-5 To avoid impacts to nesting Swainson's hawks, the Department has prepared guidelines for conducting surveys for Swainson's hawk entitled: Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (CDFG 2000). These survey recommendations were developed by the Swainson's Hawk Technical Advisory Committee (TAC) to maximize the potential for locating nesting Swainson's hawks, and thus, reduce the potential for nest failures as a result of project activities and/or disturbances. To meet the Department's recommendations for mitigation and protection of Swainson's hawks in this guideline, surveys shall be conducted by a qualified raptor biologist for a 0.25-mile radius around all project activities and shall be completed for at least two survey periods as is found in the Department's 2000 survey guidelines (CDFG 2000). The guidelines provide specific recommendations regarding the number of surveys based on when the proposed project is scheduled to begin and the time of year the surveys are conducted. A copy of this survey report shall be provided to the City of Antioch prior to starting construction.* *The applicant shall prepare a Swainson's Hawk*	LS

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Monitoring and Habitat Management Plan if a qualified raptor biologist determines that a nest site could be impacted or project activities could otherwise cause "take" of the Swainson's hawk, its eggs, or young. If take could occur as determined by a qualified raptor biologist, protective buffers shall be established on the project site that shall prevent such take from occurring. The protective buffer shall be maintained until such time that the Swainson's hawks have completed their nesting cycle as determined by a qualified raptor biologist. The nest protection buffer shall be coordinated with the Department. *In addition, the 272 acre Marsh Creek Mitigation Property (or an alternative mitigation property with comparable biological resources) shall compensate for project related impacts from the loss of the 141.6 acres of project site farmland that constitutes suitable foraging habitat for the Swainson's hawk. Mitigation that compensates for the loss of suitable Swainson's hawk foraging habitat shall include the preservation of the 272 acre Marsh Creek Property, which supports grasslands that provide suitable foraging habitat for Swainson's hawks.*	

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
4.3-6 Impacts to nesting raptors.	PS	*4.3-6* *In order to avoid impacts to nesting raptors, a nesting survey shall be conducted within 14 days prior to commencing with construction if this work would commence between February 1st and August 31st. The raptor nesting surveys shall include examination of all trees within 300 feet of the entire project site, not just trees slated for removal.* *If nesting raptors are identified during the surveys, the dripline of the nest tree must be fenced with orange construction fencing (provided the tree is on the project site), and a 300-foot radius around the nest tree must be staked with bright orange lath or other suitable staking. If the tree is located off the project site, then the buffer shall be demarcated per above where the buffer intersects the project site. The size of the buffer may be altered if a qualified raptor biologist conducts behavioral observations and determines the nesting raptors are well acclimated to disturbance. If this occurs, the raptor biologist shall prescribe a modified buffer that allows sufficient room to prevent undue disturbance/harassment to the nesting raptors. No construction or earth-moving activity shall occur within the established buffer until it is determined by a qualified raptor biologist that the young have*	LS

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		fledged (that is, left the nest) and have attained sufficient flight skills to avoid project construction zones. This typically occurs by August 1st. This date may be earlier or later, and would have to be determined by a qualified raptor biologist. If a qualified biologist is not hired to watch the nesting raptors then the buffers shall be maintained in place through the month of August and work within the buffer can commence September 1st.	
4.3-7 Impacts to nesting special-status bird species and nesting common bird species.	PS	*4.3-7 If project site disturbance associated with the proposed project would commence between March 1st and September 1st, a preconstruction nesting survey shall be completed in the 14 day period prior to commencing with any proposed project related disturbance on the project site. The nesting survey shall be conducted on the project site and within a zone of influence around the project site. The zone of influence includes those areas off the project site where birds could be disturbed by earth-moving vibrations or noise. Accordingly, the nesting survey(s) must cover the project site and an area around the project site boundary.*	LS

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		If special-status birds are identified nesting on or adjacent to the project site, a non-disturbance buffer of 100 feet shall be established or as otherwise prescribed by a qualified ornithologist. If common (that is, not special-status) birds for example, California towhee, western scrub jay, or acorn woodpeckers are identified nesting on or adjacent to the project site, a non-disturbance buffer of 75 feet shall be established or as otherwise prescribed by a qualified ornithologist. The buffer shall be demarcated with painted orange lath or via the installation of orange construction fencing. Disturbance within the buffer shall be postponed until it is determined by a qualified ornithologist that the young have fledged and have attained sufficient flight skills to leave the area or that the nesting cycle has otherwise completed. *Typically, most passerine birds in the region of the project site are expected to complete nesting by August 1st. However, many species can complete nesting by the end of June or early to mid-July. Regardless, nesting buffers shall be maintained until September 1st unless a qualified ornithologist*	

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SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		determines that young have fledged and are independent of their nests at an earlier date. If buffers are removed prior to September 1st, the qualified biologist conducting the nesting surveys shall prepare and submit a report to the City of Antioch that provides details about the nesting outcome and the removal of buffers. This report shall be submitted prior to the time that nest protection buffers are removed if the date is before September 1st.	
4.3-8 Impacts to the San Joaquin kit fox.	PS	*4.3-8(a) To compensate for the permanent loss of 141.6 acres of potential San Joaquin kit fox migration habitat, albeit farmed land, the proposed project includes the permanent preservation and protection of the Marsh Creek Property. An alternative mitigation property approved by the United States Fish and Wildlife Service that possesses comparable biological resources may also be used for mitigation in lieu of the Marsh Creek Property. The Marsh Creek Property is 272 acres that will be managed to benefit San Joaquin kit fox and that provides suitable mitigation for the loss of 141.6 acres of farmland that otherwise provides marginal San Joaquin kit fox migration habitat. In addition, there is a 1991 occurrence for San Joaquin kit fox that was recorded approximately 0.50 mile to the east of the Marsh*	LS

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Creek Property (CNDDB Record No. 573), and there are 9 additional reported occurrences of San Joaquin kit fox within 5 miles of the property. Thus, the Marsh Creek Property has moderate value to the San Joaquin kit fox, as compared to the project site, an agricultural property that has marginal value to the kit fox as migration habitat. *The East Contra County Conservancy in concert with the Service and the Department, in the East Contra Costa county HCP indicate that the Marsh Creek Property is located in an area deemed to have high value for preservation. In the HCP, the property is mapped within an area designated as within the "Medium Level of Acquisition Effort" category in "Suitable Core Habitat" for the San Joaquin kit fox. The mitigation property is also mapped in the HCP as a "Potential Kit Fox Movement Route" indicating that the property has value to the San Joaquin kit fox. The geographic location of the property adjacent to EBRPD Round Valley Regional Park further makes it a valuable mitigation property with significant regional importance as a preservation property.*	

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		4.3-8(b) The following measures shall be implemented by a qualified biologist: • *An education program shall be conducted by a qualified biologist prior to the start of construction to explain the endangered species concerns to contractors working at the project site. The program shall include an explanation of the FESA and CESA and any endangered species concerns in the area.* • *Qualified biologists would conduct preconstruction den surveys no more than 14 days prior to site grading to ensure that potential kit fox dens are not disrupted. If "potential dens" are located, infrared camera stations shall be set up and maintained for 3 consecutive nights at den openings prior to initiation of grading activities to determine the status of the potential dens. If no kit fox is found to be using the den, site grading can proceed unhindered. However, if a kit fox is found using a den site within the project site the Service and the Department shall be notified and consulted before work activities resume.* • *To prevent harm to San Joaquin kit fox, any steep-walled holes and/or trenches excavated on*	

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		the project site shall be completely covered at the end of each workday, or escape ramps shall be provided to allow any entrapped animals to escape unharmed. All pipe sections stored at the project site overnight that are four inches in diameter or greater shall be inspected for San Joaquin kit fox before the pipes are moved or buried. If San Joaquin kit fox are identified in the work area at any time, the Service and/or the Department shall be notified and consulted before work activities resume. All trash items shall be removed from the site to reduce the potential for attracting predators of San Joaquin kit fox. Contractors shall be prohibited from bringing firearms and pets to the job site.	
4.3-9 Impacts to Waters of the United States and/or State.	PS	*4.3-9 The applicant is proposing to mitigate for project-related impacts to 0.027 acre of waters of U.S. and a total of 0.11 acre of "waters of the State" via the purchase of 0.20-acre seasonal wetland credits from the Cosumnes Mitigation Bank or other Mitigation Bank, or as otherwise required by the USACE and the RWQCB, provided that the mitigation is no less than 1:1 (replacement : impact). The Service Area for the Cosumnes Mitigation Bank covers the project site.*	LS

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		Alternatively, the applicant may create, preserve, and manage new seasonal wetlands at the Marsh Creek Property (or comparable offsite location) at a 2:1 mitigation ratio (acres created and preserved: acre impacted). A project-specific Wetland Mitigation and Monitoring Plan prepared by a qualified restoration ecologist that includes the following information shall be provided to the City/USACE/RWQCB prior to conducting any activity that would result in the placement of any fill material into a water of the U.S. or water of the state: a description of the impacted water; a map depicting the location of the mitigation site(s) and a description of existing site conditions; a detailed description of the mitigation design that includes: the location of the new seasonal wetlands; proposed construction schedule; a planting/vegetation plan; specific monitoring metrics, and objective performance and success criteria, such as delineation of created area as jurisdictional waters using USACE published methods; contingency measures if the created wetlands do not achieve the specified success criteria; and short-term and long-term management and monitoring methods.	

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		If the wetland mitigation site is a separate mitigation property that is not subject to mitigation measure BIO-1, the applicant shall grant a conservation easement to a qualified entity, as defined by Section 81.5.3 of the California Civil Code, preserving the created seasonal wetland(s) in perpetuity, and establish an endowment fund to provide for the long-term management, maintenance, and monitoring of the created seasonal wetland(s). *Proof of compliance with the mitigation measure shall be submitted to the Community Development Director prior to the issuance of grading permits.*	
4.3-10 Impacts to Department of Fish and Wildlife Fish and Game Code Section 1602 jurisdictional area.	PS	*4.3-10(a) The applicant shall implement appropriate BMPs to prevent construction related impacts that could introduce de minimus fill or other pollutants into Sand Creek. These measures include the installation of wildlife friendly hay wattles and/or silt fence that shall prevent unintended de minimus fill impact to Sand Creek while the stormwater outfall is constructed. In addition, orange silt fencing shall be installed at the top-of-bank of Sand Creek to prevent unintended human and equipment traffic in areas that are not*	LS

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		relevant to the construction of the proposed project. Finally, the dripline of all protected trees within the footprint of the proposed project including trees that could be impacted by the construction of the outfall structure in Sand Creek shall be protected via the installation of orange construction fencing. *4.3-10(b) The applicant may satisfy this mitigation by providing the City of Antioch with a fully executed copy of a Streambed Alteration Agreement with the Department for the proposed outfall structure that includes these, or other functionally equivalent, BMPs. The implementation of the executed Streambed Alteration Agreement shall become a condition of project approval.*	
4.3-11 Impacts to wildlife corridors.	LS	*None required.*	N/A
4.3-12 Impacts to protected trees under the City of Antioch's Tree Preservation and Regulation Ordinance.	PS	*4.3-12(a) The final site plan shall indicate the location of any protected trees within the development footprint that the City has required to be saved as a condition to project approval. Compliance with the City of Antioch's Tree Preservation and Regulation ordinance shall occur as follows:* • *There shall be no excavation within the drip*	LS

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		line of any protected trees to be saved unless specific plans are submitted to the Department of Community Development that indicate how grading within the drip line is to be carried out within critically harming the tree. Additional arborist's studies must be provided to support the grading proposed. • *Prior to the granting of a building permit the Applicant shall post a bond for each protected tree at which grading will occur within the drip line. The bonding schedule will be as listed in Section 9-5.1206 of the Municipal Code. The City will conduct ongoing inspections during the course of the grading to assure adherence to approved plans. Should the protected tree(s) die during the course of property development, the bond shall be forfeited to the city and used for tree replacement. A percentage of the bond will be retained in either case to assure tree survival for up to five years after the issuance of a certificate of occupancy.* • *Unless specific exceptions are granted prior to the initiation of construction, all construction activity and traffic shall be prohibited from the area within the drip line*	

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		of a protected tree. • *Should a protected tree be damaged during site development, the Applicant shall administer all reasonable methods of treatments as approved by the Director of Community Development. The repair of the damage shall be at the expense of the Applicant.* • *Any time after initial approval of a site plan, an applicant's request to remove a protected tree as shown on the approved site plan will require a hearing. A new public hearing will be held on the issue of tree removal and the applicant will be required to re-notice the surrounding property owners.* • *All future owners of parcels on which trees were required to be maintained (as a condition of approval) shall be responsible for continued maintenance of such trees. Buyers of property with such trees, as well as buyers of all new single-family homes, shall be given disclosure notices of this requirement, and all other responsibility of tree management and/or preservation as required by the Tree Preservation and Regulation Ordinance.*	

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Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		4.3-12(b) *To compensate for the loss of up to 34 trees, 136 replacement trees equivalent to a 4:1 mitigation ratio (replacement trees: removed trees) shall be planted as alternatively and equally compliant with the City of Antioch's Tree Preservation and Regulation ordinance as follows:* • *Four 5-gallon potted trees shall be planted for the loss of each "established" or "mature" tree at the Vineyards at Sand Creek Project site. Four 5-gallon potted trees shall be planted for the loss of the one "landmark" tree since the tree is non-native and in poor condition. A 4:1 mitigation ratio (replacement trees: removed trees) is suitable for the loss of the landmark tree at the Vineyards at Sand Creek Project site because the tree is non-native and is in poor health. This landmark tree will decline regardless of treatment.* • *All of the mitigation trees shall be native trees indigenous to the region. Trees planted as mitigation may be incorporated into the landscape plans.* • *All planted trees shall be provided with a temporary irrigation system that would be*	

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		maintained over a minimum three-year establishment period. The irrigation system shall be placed on electric timers so that trees are automatically watered during the dry months of the establishment period. At the end of a suitable establishment period, the irrigation system may be removed. • *All of these replacement trees shall be monitored annually for a minimum of three years by a qualified biologist or arborist, and an annual monitoring report shall be submitted to the City of Antioch's Planning Department. Maintenance will include measures to minimize predation of planted trees by rodents including, but not limited to, pocket gophers (Thomomys bottae) and/or California ground squirrels (Spermophilus beechyi).* • *At the end of a three-year monitoring period, at least 75 percent of planted trees should be in good health. If so, yearly monitoring and reporting is complete. If the numbers of planted trees falls below a 75 percent survival rate, additional trees shall be planted to bring the total number of planted trees up to 100 percent of the*	

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		original number of trees planted, and irrigation, monitoring and reporting to the City shall continue until the survival rate is achieved.	
4.3-13 Impacts to the Habitat Conservation Plan.	LS	*None Required.*	N/A
4.3-14 Cumulative loss of biological resources in the City of Antioch and the effects of ongoing urbanization in the region.	PS	*4.4-14 Implement Mitigation Measures 4.3-1 through 4.3-12(b).*	LS
4.4 Cultural Resources			
4.4-1 Historic cultural resources.	LS	*None required.*	N/A
4.4-2 Archaeological resources and human remains.	PS	*4.4-2(a) In the event of the accidental discovery or recognition of any human remains, further excavation or disturbance of the find or any nearby area reasonably suspected to overlie adjacent human remains shall not occur until compliance with the provisions of CEQA Guidelines Section 15064.5(e)(1) and (2) has occurred. The Guidelines specify that in the event of the discovery of human remains other than in a dedicated cemetery, no further excavation at the site or any nearby area suspected to contain human remains shall occur until the County Coroner has been notified to determine if an investigation into the cause of death*	LS

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		is required. If the coroner determines that the remains are Native American, then, within 24 hours, the Coroner must notify the Native American Heritage Commission, which in turn will notify the most likely descendants who may recommend treatment of the remains and any grave goods. If the Native American Heritage Commission is unable to identify a most likely descendant or most likely descendant fails to make a recommendation within 24 hours after notification by the Native American Heritage Commission, or the landowner or his authorized agent rejects the recommendation by the most likely descendant and mediation by the Native American Heritage Commission fails to provide a measure acceptable to the landowner, then the landowner or his authorized representative shall rebury the human remains and grave goods with appropriate dignity at a location on the property not subject to further disturbances. Should human remains be encountered, a copy of the resulting County Coroner report noting any written consultation with the Native American Heritage Commission shall be submitted as proof of compliance to the City's Community Development Department.	

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		4.4-2(b) If any prehistoric or historic artifacts, or other indications of cultural deposits, such as historic privy pits or trash deposits, are found once ground disturbing activities are underway, all work within the vicinity of the find(s) shall cease and the find(s) shall be immediately evaluated by a qualified archaeologist. If the find is determined to be a historical or unique archaeological resource, contingency funding and a time allotment to allow for implementation of avoidance measures or appropriate mitigation shall be made available (CEQA Guidelines Section 15064.5). Work may continue on other parts of the project site while historical or unique archaeological resource mitigation takes place (Public Resources Code Sections 21083 and 21087).	
4.4-3 Paleontological resources.	PS	*4.4-3 The applicant shall retain the services of a professional paleontologist to educate the construction crew that will be conducting grading and excavation at the project site. The education shall consist of an introduction to the geology of the project site and the kinds of fossils that may be encountered, as well as what to do in case of a discovery. Should any vertebrate fossils (e.g., teeth, bones), an unusually large or dense accumulation of intact invertebrates, or well-preserved plant material*	LS

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		(e.g., leaves) be unearthed by the construction crew, then ground-disturbing activity shall be diverted to another part of the project site and the paleontologist shall be called on-site to assess the find and, if significant, recover the find in a timely matter. Finds determined significant by the paleontologist shall then be conserved and deposited with a recognized repository, such as the University of California Museum of Paleontology. The alternative mitigation would be to leave the significant finds in place, determine the extent of significant deposit, and avoid further disturbance of the significant deposit. Proof of the construction crew awareness training shall be submitted to the City's Community Development Department in the form of a copy of training materials and the completed training attendance roster.	
4.4-4 Cumulative loss of cultural resources.	LS	*None required.*	N/A
4.5 Geology, Soils, and Mineral Resources			
4.5-1 Risks to people and structures associated with seismic activity, including ground shaking and ground failures, such as liquefaction or landslides.	PS	*4.5-1 Prior to final project design, the project applicant shall submit to the City of Antioch Engineering Department, for review and approval, a design-level geotechnical engineering report produced by a California Registered Civil Engineer or*	LS

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Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Geotechnical Engineer. The design-level report shall include measures to address construction requirements to mitigate, at a minimum, slope stability, liquefiable soils, and ground shaking. Measures to address the aforementioned geological concerns shall include, at a minimum, the following: • *The use of post-tensioned concrete mat foundations for liquefaction-induced settlement;* • *The over-excavation of a minimum of three feet of soil to remove existing structure foundations and non-engineered fill in order to place the soil back on-site as engineered fill; and* • *Soil borings and/or cone penetration tests within the development areas and laboratory soil testing to provide date for preparation of specific recommendations regarding grading, foundations, and drainage for the proposed construction.*	
4.5-2 Risks to people and structures associated with expansive soils.	PS	*4.5-2 Prior to final project design, the project applicant shall submit to the City of Antioch Engineering Department, for review and approval, a design-level geotechnical engineering report produced by a California Registered Civil Engineer or Geotechnical Engineer. The design-level report shall include measures to address construction*	LS

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		requirements to mitigate, at a minimum, expansive/unstable soils. Measures to address the aforementioned geological concerns shall include, at a minimum, the following: • *The use of post-tensioned concrete mat foundations or similarly stiffened foundations systems which are designed to resist the deflections associated with soil expansion. The foundations are anticipated to be 10 to 12 inches thick;* • *The over-excavation of a minimum of three feet of soil to remove existing structure foundations and non-engineered fill in order to place the soil back on-site as engineered fill; and* • *Soil borings and/or cone penetration tests within the development areas and laboratory soil testing to provide date for preparation of specific recommendations regarding grading, foundations, and drainage for the proposed construction.* *All grading and site development plans should be coordinated with the Engineering Geologist and the Geotechnical Engineer to modify plans for the mitigation of known soil and geologic hazards during*	

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		the planning process. The final 40-scale grading plans for the project site should be reviewed by the Geotechnical Engineer before submittal to the appropriate regulatory agencies in order to develop a corrective grading plan and provide a detailed review.	
4.5-3 Risks associated with substantial erosion or loss of topsoil.	PS	*4.5-3 Prior to final project design, the project applicant shall submit, for the review and approval by the City Engineer, an erosion control plan that utilizes standard construction practices to limit the erosion effects during construction of the proposed project. Measures shall include, but are not limited to, the following:* • *Hydro-seeding;* • *Placement of erosion control measures with drainageways and ahead of drop inlets;* • *The temporary lining (during construction activities) of drop inlets with "filter fabric" (a specific type of geotextile fabric);* • *The placement of straw wattles along slope contours;* • *Directing subcontractors to a single designation "wash-out" location (as opposed to allowing them to wash-out in any location they desire);* • *The use of siltation fences; and*	LS

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		• *The use of sediment basins and dust palliatives.*	
4.5-4 Loss of availability of a known mineral resource that would be of value to the region and the residents of the State or of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.	NI	*None required.*	N/A
4.5-5 Cumulative increase in the potential for geological related impacts and hazards.	LS	*None required.*	N/A
4.6 Hazards and Hazardous Materials			
4.6-1 The routine transport, use, or disposal of hazardous materials, and/or emitting or handling hazardous materials, substances, or waste within one-quarter mile of a school.	LS	*None required.*	N/A
4.6-2 An upset or accidental release of hazardous materials into the environment.	PS	*4.6-2(a) Prior to commencement of grading and construction, the construction contractor, a representative from PG&E, Calpine, and a representative from the City's Engineering Department shall meet on the project site and prepare site-specific safety guidelines for construction in the field to the satisfaction of the City Engineer. The safety*	LS

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		guidelines and field-verified location of the pipelines shall be noted on the improvement plans and be included in all construction contracts involving the project site. *4.6-2(b) All abandoned oil pipelines within the areas of the project site planned for development shall be removed. Any associated apparent soil contamination (soil staining, odors, debris fill material, etc.) shall be properly evaluated and mitigated where necessary, in accordance with Mitigation Measure 4.6-2(c).* *4.6-2(c) If indicators of apparent soil contamination (soil staining, odors, debris fill material, etc.) are encountered at the project site, specifically in the vicinity of abandoned oil/gas wells or during removal of abandoned oil pipelines, the impacted area should be isolated from surrounding, non-impacted areas. The project environmental professional shall obtain samples of the potentially impacted soil for analysis of the contaminants of concern and comparison with applicable regulatory residential screening levels (i.e., Environmental Screening Levels, California Human Health Screening Levels, Regional Screening Levels, etc.).*	

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		Where the soil contaminant concentrations exceed the applicable regulatory residential screening levels, the impacted soil shall be excavated and disposed of offsite at a licensed landfill facility to the satisfaction of the Contra Costa Environmental Health Department. *4.6-2(d) Prior to final map approval, the project applicant shall submit to the City of Antioch Engineering Department, for review and approval, plans which show that inhabited structures will not be located directly over the three on-site abandoned oil/gas wells. The plans shall be completed in compliance with the DOGGR Construction Site Review Program, which includes guidelines and recommendations for setbacks and mitigation measures for venting systems.*	
4.6-3 Located on a site included on a list of hazardous materials sites.	NI	*None required.*	N/A
4.6-4 Interference with an adopted emergency response plan or emergency evacuation plan.	NI	*None required.*	N/A
4.6-5 Wildland fires.	LS	*None required.*	N/A
4.6-6 Safety hazards associated with an airport or private airstrip.	NI	*None required.*	N/A

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4.6-7 Cumulative increase in the number of people who could be exposed to potential hazards associated with potentially contaminated soil and groundwater and an increase in the transport, storage, and use of hazardous materials from the development of the proposed project in combination with other reasonable foreseeable projects in the region.	LS	*None required.*	N/A
4.7 Hydrology and Water Quality			
4.7-1 Substantially alter the existing drainage pattern of the site or area, or create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems.	LS	*None required.*	N/A
4.7-2 Violate any water quality standards or waste discharge requirements, provide substantial additional sources of polluted runoff, or otherwise substantially degrade water quality during construction.	LS	*None required.*	N/A

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4.7-3 Violate any water quality standards or waste discharge requirements, provide substantial additional sources of polluted runoff, or otherwise substantially degrade water quality during operations.	LS	*None required.*	N/A
4.7-4 Substantially deplete groundwater supplies or interfere substantially with groundwater recharge.	LS	*None required.*	N/A
4.7-5 Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or flood hazard delineation map, or place within a 100-year floodplain structures which would impede or redirect flood flows.	LS	*None required.*	N/A
4.7-6 Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.	LS	*None required.*	N/A
4.7-7 Inundations by seiche, tsunami, or mudflow.	NI	*None required.*	N/A
4.7-8 Cumulative impacts to hydrology and water quality.	LS	*None required.*	N/A

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4.8 Land Use and Planning / Agricultural Resources			
4.8-1 Physical division of an established community.	LS	*None required.*	N/A
4.8-2 Compatibility with surrounding uses.	LS	*None required.*	N/A
4.8-3 Consistency with the Antioch General Plan.	LS	*None required.*	N/A
4.8-4 Consistency with existing zoning.	LS	*None required.*	N/A
4.8-5 Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance ("Farmland"), or 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.	NI	*None required.*	N/A
4.8-6 Conflict with agricultural zoning or a Williamson Act contract.	NI	*None required.*	N/A
4.8-7 Conflict with forest land or timberland zoning, or result in the loss of forest land or conversion of forest land to non-forest use.	NI	*None required.*	N/A

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4.8-8 Induce substantial population growth.	LS	*None required.*	N/A
4.8-9 Displace substantial existing housing or substantial numbers of people.	LS	*None required.*	N/A
4.8-10 Cumulative land use and planning incompatibilities.	LS	*None required.*	N/A
4.8-11 Impacts related to cumulative loss of agricultural land.	LS	*None required.*	N/A
4.8-12 Cumulative population and housing impacts.	LS	*None required.*	N/A
4.9 Noise			
4.9-1 Aircraft noise.	NI	*None required.*	N/A
4.9-2 Impacts related to a substantial temporary or periodic increase in ambient noise levels in the project vicinity.	PS	*4.9-2(a) Noise-generating activities at the construction site or in areas adjacent to the construction site that are associated with the proposed project in any way shall adhere to the requirements of the City of Antioch Zoning Ordinance with respect to hours of operations, subject to review and approval by the City Building Official. Specifically, construction activities shall not occur during the hours specified below:* • *On weekdays prior to 7:00 AM and after 6:00 PM;*	LTS

NI = *No Impact*; N/A = *Not Applicable*; LS = *Less-than-Significant*; PS = *Potentially Significant*; S = *Significant*; SU = *Significant and Unavoidable*

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		• *On weekdays within 300 feet of occupied dwellings, prior to 8:00 AM and after 5:00 PM; and* • *On weekends and holidays, prior to 9:00 AM and after 5:00 PM, irrespective of the distance from the occupied dwellings.* *4.9-2(b) Prior to issuance of the grading permit, the project contractor shall ensure that all intake and exhaust ports on power construction equipment shall be shrouded or shielded from sensitive receptors according to industry best practices, subject to review and approval by the City Building Official.* *4.9-2(c) Prior to issuance of the grading permit, the project contractor shall designate a disturbance coordinator and conspicuously post the coordinator's number around the project site and in adjacent public spaces, subject to review and approval by the City Building Official. The disturbance coordinator shall receive any and all public complaints about construction noise disturbances and shall be responsible for determining the cause of the complaint and implementing any feasible measures to be taken to alleviate the problem.*	

NI = *No Impact*; N/A = *Not Applicable*; LS = *Less-than-Significant*; PS = *Potentially Significant*; S = *Significant*; SU = *Significant and Unavoidable*

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		4.9-2(d) Prior to the issuance of the grading permit, the applicants shall submit a construction-related noise mitigation plan to the City Building Official for review and approval. The plan shall depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of the project through the use of such methods as: • *The construction contractor shall use temporary noise-attenuation fences, where feasible, to reduce construction noise impacts on adjacent noise sensitive land uses.* • *During all project site excavation and grading on-site, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.* • *The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receptors*	

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		nearest the project site during all project construction.	
4.9-3 Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.	LS	*None required.*	N/A
4.9-4 Transportation noise at existing sensitive receptors.	LS	*None required.*	N/A
4.9-5 Transportation noise at new sensitive receptors.	PS	*4.9-5(a) In conjunction with submittal of Improvement Plans, the applicant shall show on the Improvement Plans that sound walls and/or landscaped berms shall be constructed along Hillcrest Avenue and Sand Creek Road at proposed residential uses. The specific height and location of the noise barrier shall be confirmed based upon the final approved site and grading plans. See* **Error! Reference source not found.** *for the recommended noise barrier placement and required wall height. Wall height shown in the aforementioned figure is relative to building pad elevations. Noise barrier walls shall be constructed of concrete panels, concrete masonry units, earthen berms, or any combination of these materials. Wood is not recommended due to eventual warping and degradation of acoustical performance. The Improvement Plans shall be subject to review and approval by the City Engineer.*	LS

NI = *No Impact*; N/A = *Not Applicable*; LS = *Less-than-Significant*; PS = *Potentially Significant*; S = *Significant*; SU = *Significant and Unavoidable*

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		4.9-5(b) In conjunction with submittal of Building Plans, the applicant shall show on the plans that mechanical ventilation shall be installed in all residential uses to allow residents to keep doors and windows closed, as desired for acoustical isolation. The building plans shall be subject to review and approval by the City Building Official.	
4.9-6 Operational noise from activities on-site post development.	LS	*None required.*	N/A
4.9-7 Cumulative impacts on noise-sensitive receptors.	PS	*4.9-7 Implement Mitigation Measures 4.9-5(a) and 4.9-5(b).*	LS
4.10 Public Services, Recreation, and Utilities			
4.10-1 Result in insufficient water supply.	LS	*None required.*	N/A
4.10-2 Wastewater services.	LS	*None required.*	N/A
4.10-3 Solid waste services.	LS	*None required.*	N/A
4.10-4 Adequate fire protection and emergency medical services.	LS	*None required.*	N/A
4.10-5 Adequate law enforcement protection services.	LS	*None required.*	N/A
4.10-6 Adequate school capacity.	PS	*4.10-6 Prior to building permit issuance for any residential development, the developer shall submit to the Community Development Department written proof from the BUSD and the LUHSD that appropriate school mitigation fees have been paid.*	LS

NI = *No Impact*; N/A = *Not Applicable*; LS = *Less-than-Significant*; PS = *Potentially Significant*; S = *Significant*; SU = *Significant and Unavoidable*

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
4.10-7 Adequate parks and recreation facilities.	PS	*4.10-7 Per the Antioch Municipal Code, at the time of the filing of the final subdivision map, the subdivider shall provide a combination of parkland dedication and the payment of in-lieu fees into the City of Antioch's Park Fee Trust Fund to the satisfaction of the City Engineer/Director of Public Works.*	LS
4.10-8 Adequate library services.	LS	*None required.*	N/A
4.10-9 Adequate electricity and natural gas services.	LS	*None required.*	N/A
4.10-10 Development of the proposed project, in combination with future buildout in the City of Antioch, would increase demand for additional public services and utilities.	LS	*None required.*	N/A
4.11 Transportation and Circulation			
4.11-1 Traffic related to construction activities.	PS	*4.11-1 Prior to issuance of grading and building permits, the developer shall submit a Traffic Control Plan, subject to review and approval by the City Engineer. The requirements within the Traffic Control Plan shall include, but are not necessarily limited to, the following:* • *Project staging plan to maximize on-site storage of materials and equipment;*	LS

NI = *No Impact*; N/A = *Not Applicable*; LS = *Less-than-Significant*; PS = *Potentially Significant*; S = *Significant*; SU = *Significant and Unavoidable*

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		• *A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak hours; lane closure proceedings; signs, cones, and other warning devices for drivers; and designation of construction access routes;* • *Permitted construction hours;* • *Identification of parking areas for construction employees, site visitors, and inspectors, including on-site locations; and* • *Provisions for street sweeping to remove construction-related debris on public streets.*	
4.11-2 Study roadway intersections and freeway facilities under Existing Plus Project conditions.	LS	*None required.*	N/A
4.11-3 Study roadway intersections and freeway facilities under Near-Term Plus Project conditions.	LS	*None required.*	N/A
4.11-4 Alternative transportation facilities.	LS	*None required.*	N/A
4.11-5 Site access, circulation, and emergency access.	PS	*4.11-5 Prior to approval of Improvement Plans, the Improvement Plans shall show that the northbound left-turn pocket from Heidorn Ranch Road and the southbound left-turn pocket from Hillcrest Avenue shall be designed to provide approximately 75 to 100 feet of vehicle storage, plus the taper length. The Improvement Plans shall be subject to review and*	LS

NI = *No Impact*; N/A = *Not Applicable*; LS = *Less-than-Significant*; PS = *Potentially Significant*; S = *Significant*; SU = *Significant and Unavoidable*

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		approval by the City Engineer.	
4.11-6 Study roadway intersections and freeway facilities under Cumulative Plus Project conditions.	PS	*4.11-6 Prior to issuance of a building permit, the project applicant shall pay regional transportation impact fees to the East Contra Costa Regional Fee and Financing Authority (ECCRFFA) that would fund construction of additional improvements at the Sand Creek Road interchange, which includes a slip-ramp for the eastbound Sand Creek to southbound State Route 4 movement, eliminating the conflicting left-turn movement at the intersection. Construction of this improvement would result in acceptable operations (as shown in **Error! Reference source not found.**).*	LS

NI = *No Impact*; N/A = *Not Applicable*; LS = *Less-than-Significant*; PS = *Potentially Significant*; S = *Significant*; SU = *Significant and Unavoidable*

3. PROJECT DESCRIPTION

3 PROJECT DESCRIPTION

3.1 Introduction

Section 15125 of CEQA Guidelines requires an EIR to include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the Notice of Preparation is published, from a local and regional perspective. Knowledge of the existing environmental setting is critical to the assessment of environmental impacts. Per CEQA Guidelines Section 15125, the description of the environmental setting shall not be longer than necessary to understand the potential significant effects of the project.

The Project Description chapter of the EIR provides a comprehensive description of the Vineyards at Sand Creek Project (proposed project) in accordance with CEQA Guidelines. Please note that this chapter provides an overall general description of the existing environmental conditions; however, detailed discussions of the existing setting in compliance with CEQA Guidelines Section 15125, as it relates to each given potential impact area, is included in each technical chapter of this EIR.

3.2 Project Location

The proposed 141.6-acre project site is located in the southeastern portion of the City of Antioch in eastern Contra Costa County, California (see Figure 3-1, Regional Location Map). The City of Antioch is bordered to the north by the San Joaquin River Delta; to the east by the City of Brentwood and the City of Oakley; to the west by the City of Pittsburg and unincorporated portions of Contra Costa County; and to the south by unincorporated portions of Contra Costa County. In addition, the project site is located within the northeastern corner of the Sand Creek Focus Area of the General Plan, which contains lands designated by the Antioch General Plan for open space, residential, business park, commercial, and mixed-use development. The project site is bounded by a residential subdivision to the north, Sand Creek to the south, Heidorn Ranch Road and City of Brentwood City limits to the east, and future Hillcrest Avenue extension and vacant residential land to the west (See Figure 3-2, Project Location Map). The site is identified by the following Contra Costa County Assessor's Parcel Numbers (APNs): 057-030-003 and 057-050-007.

3.3 Project Setting and Surrounding Land Uses

The project site consists of undeveloped farm land, designated as Business Park, Public/Quasi Public, and Open Space/Senior Housing within the Sand Creek Focus Area of the City of Antioch General Plan (see Figure 3-3, Existing General Plan Designations). The site is zoned Study Zone in the Antioch Zoning Ordinance.

Figure 3-1
Regional Location Map

Figure 3-2
Project Location Map

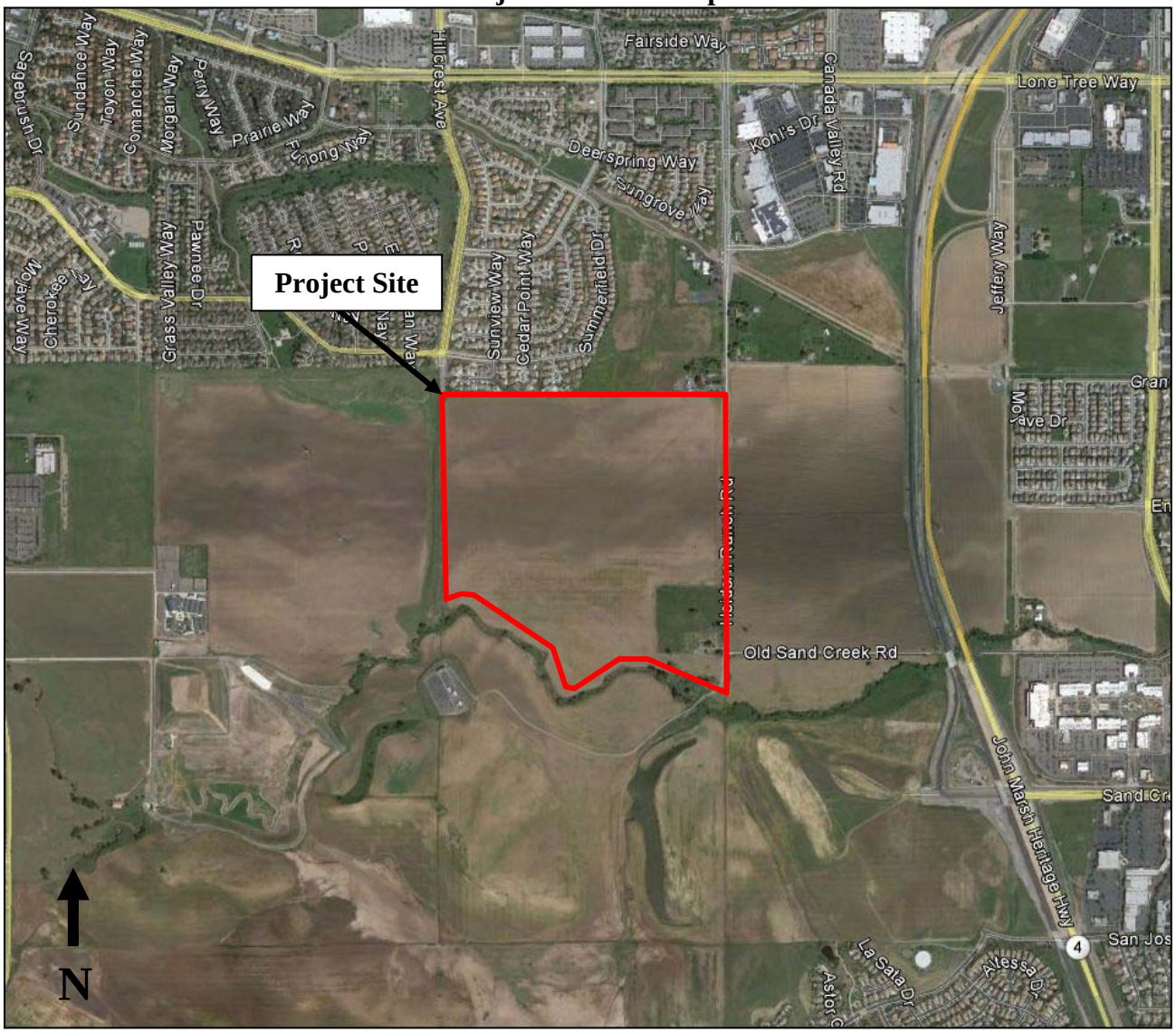
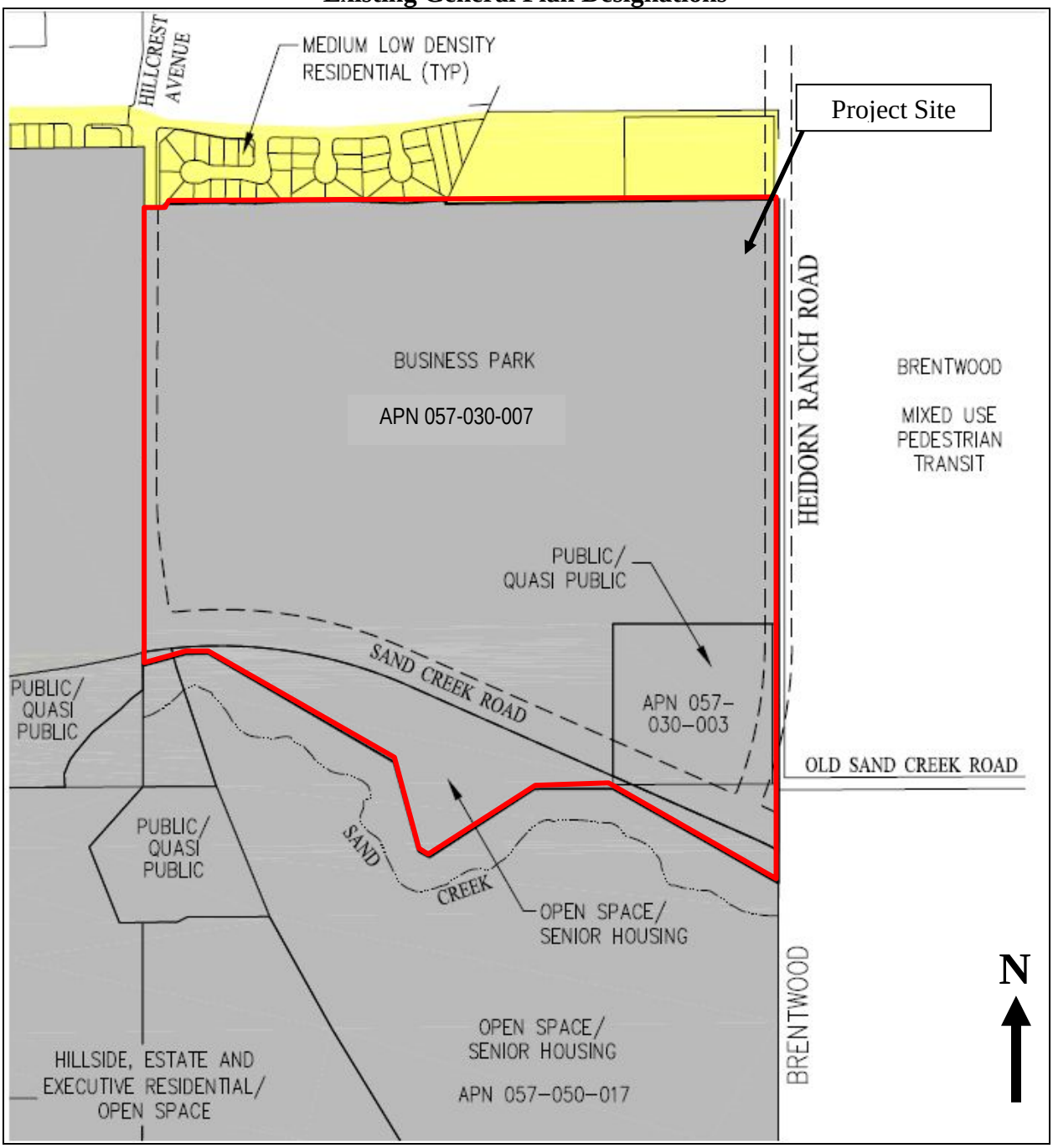


Figure 3-3
Existing General Plan Designations



The project site is surrounded by a mixture of uses including existing single-family residential uses to the north; the undeveloped but approved Aviano residential project to the west, undeveloped land planned for future residential, mixed use, and commercial development in Brentwood to the east; and Sand Creek, a PG&E facility, and undeveloped farm land to the south (planned for future residential in the City of Antioch's General Plan).

The project site consists of both on-site (referred to as the "project site") and off-site impact areas. Both areas are described in detail below.

Project Site

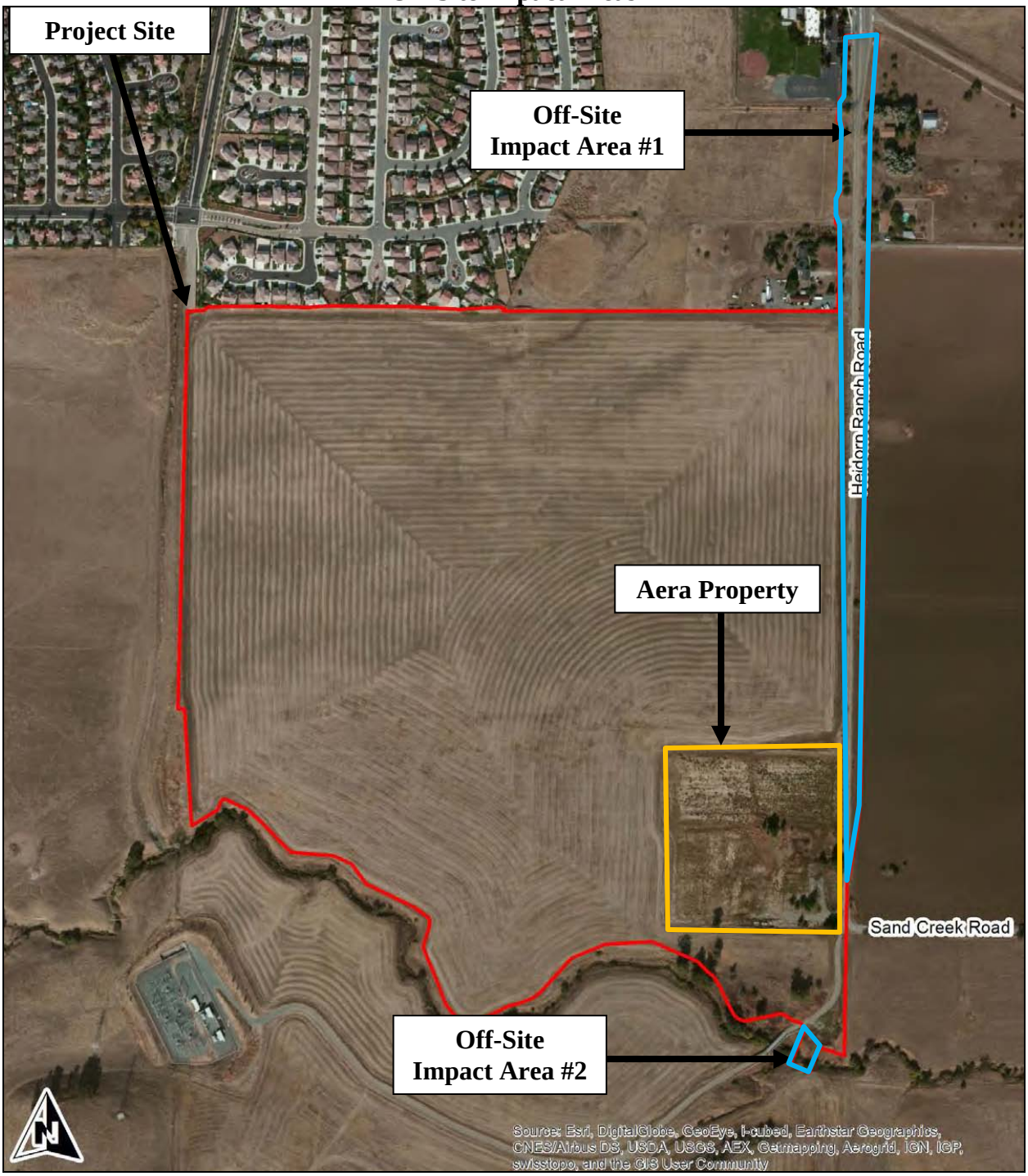
The 141.6-acre project site is comprised of two parcels, collectively called the Vineyards at Sand Creek Project. The southeastern 10 acres of the project site is known as the Aera property, which is identified by APN 057-030-003. The remaining 131 acres of the project site is identified by APN 057-030-007. The project site is primarily covered with non-native vegetation and historic aerial photos show the property has been farmed and disked since the 1930's. The project site previously contained three oil/gas wells that were abandoned by plugging in 1981 and 1991.

The site is generally rectangular; however, the southern boundary shifts north and south in an irregular shape, as shown in Figure 3-2. The site's terrain is generally flat and the existing topography falls from southwest to southeast at approximately one percent slope with elevations ranging from 150 to 175 feet above mean sea level. Sand Creek, a tributary of Marsh Creek, flows in a northeastern direction and is located south of the project site. A 25-foot wide Shell Oil Company easement runs in an east-west direction across the southern portion of the site. An above-ground Calpine dehydration station servicing a 10-inch Calpine gas line is located at the far southeast corner of the Aera property. The dehydration station is active, will remain active, and is regularly checked by Calpine employees. The above-ground facilities at the station include piping and cabinets with an approximate 80-foot by 20-foot footprint, standing approximately five feet tall. An approximately 58-foot wide PG&E pipeline easement with a 36-inch pipeline below ground runs in a north-south direction across the eastern edge of the project site adjacent to Heidorn Ranch Road.

Off-Site Impact Areas

The proposed project would construct off-site improvements (i.e. roadways and utilities) that would affect two off-site, adjacent areas totaling approximately 6.47 acres (see Figure 3-4). One off-site area to the north and east includes an approximately 6.02-acre portion of Heidorn Ranch Road (a dedicated public roadway in Antioch). The proposed project may affect the frontage of five private properties along the roadway alignment. The five adjacent properties are primarily flat and consist of private homes with ornamental plantings and, in one case, land planted in row crops. The second off-site area of approximately 0.4 acres to the southeast includes a portion of Sand Creek. Storm drain lines from the project's southern detention basin and a new storm drain outfall are proposed within the 0.4-acre off-site area. The off-site area is also primarily flat up to the creek top-of-bank, and a paved PG&E access road to a nearby PG&E facility traverses the alignment south of the site.

Figure 3-4
Off-Site Impact Areas



3.4 PROJECT OBJECTIVES

The following project objectives have been developed by the project applicant for the proposed project:

- To implement the City's General Plan and Sand Creek Focus Area of the General Plan goals by creating an economically viable project that is capable of providing various infrastructure improvements that are able to serve the project and facilitate service to future planned development, including trunk line infrastructure that is necessary for the ultimate development of the Sand Creek Focus Area of the General Plan, and public roadway improvements.
- To help the City of Antioch provide its fair share of housing, and help alleviate a regional housing shortage, by providing a mix of housing types and sizes, some moderately affordable, and which can meet the needs of a variety of different and growing household sizes.
- To provide Antioch's first residential gated community, and make it compatible with the surrounding residential uses, yet a visually identifiable community that is at a scale and quality similar to gated residential developments in the greater East Bay.
- To provide onsite amenities and recreational opportunities, such as a pool club and a private sports park, and provide a Sand Creek trail connection.
- To provide housing near major transportation and regional trails connections, with increased land use intensities near regional transportation connections.
- To create a community that is family friendly or that could accommodate senior residents.
- To implement the County's Growth Management Program by providing for urban development within the Urban Limit Line.
- To contribute to the City of Antioch's economic and social viability by creating a community that attracts investment and positive attention.

3.5 PROJECT COMPONENTS

The applicant is proposing to construct a residential development on 141.6 total acres, including up to 650 single-family residential units on 127.5 acres; 31.6 acres of parks and landscaped areas (some of which overlap with the residential area); the southerly extension of Heidorn Ranch Road, Hillcrest Avenue, and Sand Creek Road; extension of a portion of the Sand Creek Trail for connection to other City and regional trails; and utility improvements. In addition, the proposed project would construct off-site improvements (i.e., roadways and utilities) that would affect two off-site adjacent areas totaling approximately 6.47 acres: an area to the north and east that includes an approximately 6.02-acre portion of Heidorn Ranch Road (a dedicated public roadway in Antioch); and a 0.4 acre area to the southeast that includes a portion of Sand Creek in which storm drain lines and a storm drain outfall structure would be constructed. The following provides a summary of the project's primary components.

Residential Concept

The proposed project includes development of up to 650 single-family residential units on approximately 127.5 acres north of the future alignment of Sand Creek Road. The average density of the residential development would be approximately 5.03 units per gross acre. The proposed project would be constructed in two main phases arranged into six neighborhoods. At least six different housing layouts with three different elevations would be constructed on lots ranging from approximately 4,200 to 5,160 square feet (See Figure 3-5, Tentative Map).

Recreation, Landscaping, and Open Space

The proposed project includes the development of recreational, park, and landscape areas within the residential area. The proposed project would include the construction of a detention basin south of the residential area and extension of the Sand Creek Trail, with the remaining acreage as undeveloped open space adjacent to the Sand Creek buffer area. In addition, the proposed project would include a focus on drought-tolerant and adaptive plant species. Approximately 25 percent of the site would be set aside for open space and buffer uses, as described in detail below.

Central Park

An approximate 2.1-acre park space would be located in the middle of the project site on Parcel A. Separate parking would also be provided if recreational facilities, such as a community building or pool were incorporated in the Central Park.

Southeastern Park

An approximate 7.5-acre park space with a 3.5-acre detention basin would be located in the southeastern corner of the project site on Parcel D. A portion of the park space would include a large lawn area for youth playfields, as well as walking paths, a play structure, shade trees, and benches. Agricultural plantings would be used to delineate active areas from open space and provide a screening for the detention basin and Calpine Facility.

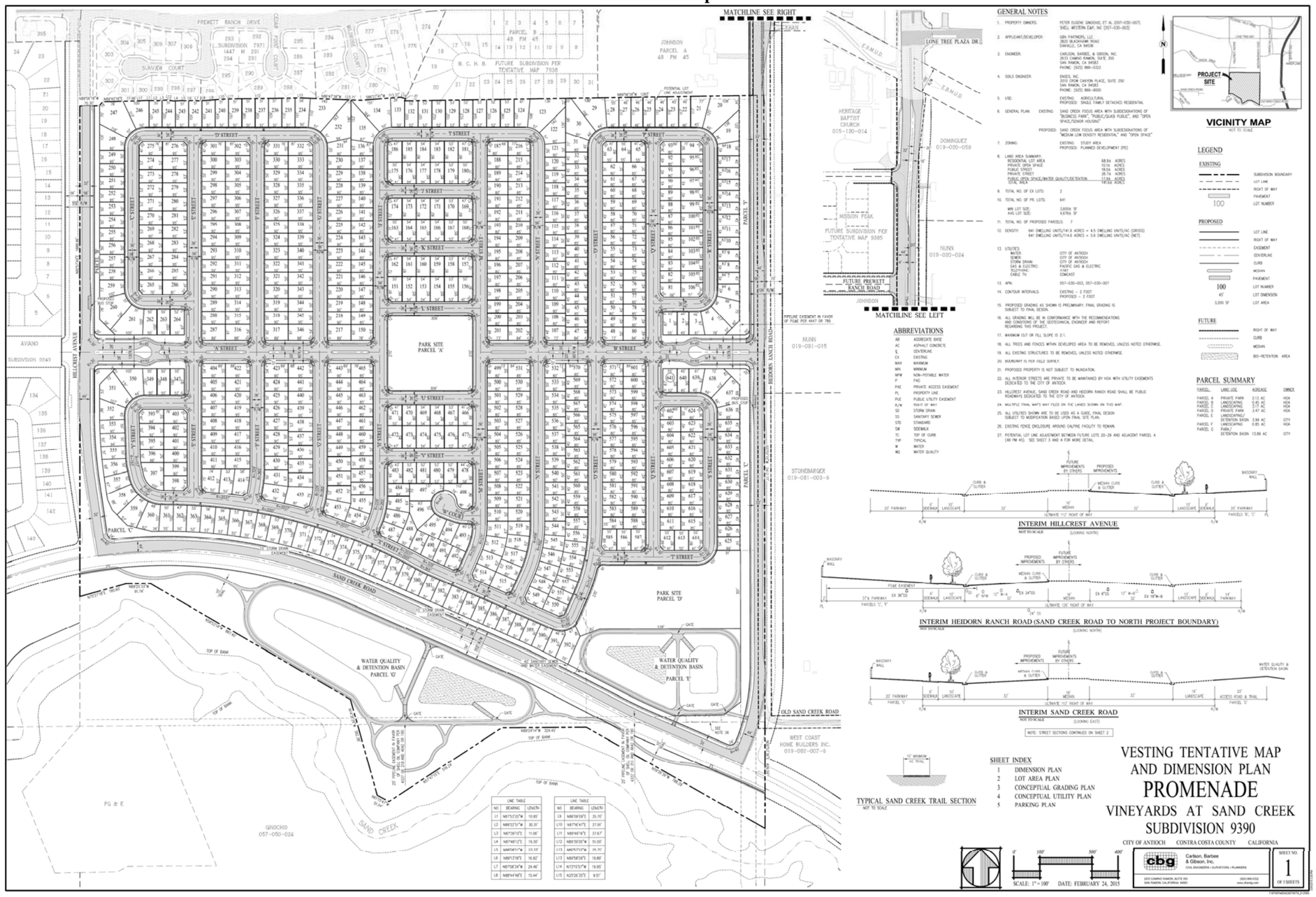
Sand Creek Regional Trail

A segment of the Sand Creek Regional Trail would be constructed within the project site. The trail would connect to the planned trail to the west, by the Aviano residential project, and would transition to the public sidewalk to the east along Sand Creek Road. Access points would be provided south of Sand Creek Road at Hillcrest Road and at Heidorn Ranch Road.

Southern Detention Basin Surrounding Open Space

Approximately 5.7 acres of open space would be included around and adjacent to the detention basin located south of Sand Creek Road.

Figure 3-5
Tentative Map



Landscaping

Landscaping would be provided throughout the project site on a total of approximately 31.6 acres. Project landscaping would consist of street trees, shrubs, groundcover, agricultural plantings, and open lawn areas. Both entrances to the project site and the main spine street would be landscaped as would the project side of Hillcrest Road, Sand Creek Road and Heidorn Ranch Road including roadway medians. Public spaces, common spaces, and private landscaping areas would have an emphasis on drought-tolerant and adaptive plant species.

Circulation, Parking, and Streetscape

Vehicular entrances and exits to the project site would be provided along the east side of the project site by improving up to 2,380 linear feet of Heidorn Ranch Road to a four-lane divided roadway from south of the East Bay Municipal Utility District (EBMUD) Mokelumne Aqueduct right-of-way to the main entrance. In addition, Heidorn Ranch Road would be extended to intersect with Sand Creek Road.

On the west side of the project site, a 1,265 linear foot improvement to Hillcrest Avenue as a four-lane divided roadway (previously approved and permitted by the Aviano residential project) would be provided as a second entrance along the westerly boundary of the site.

The Sand Creek Road four-lane divided roadway would be graded and constructed to include the northern curb and gutter, sidewalk, and landscaping. Traffic signals would be installed at the project entries and eventually at the major intersections (Hillcrest Avenue and Heidorn Ranch Road) with Sand Creek Road, when warranted. Pedestrian access to the site would be provided by sidewalks located on the roadways adjacent to the project site.

Interior vehicular circulation would be provided by a traditional grid pattern of two-way streets that connect back to a wider, central spine entry street, referred to as a Promenade. Each residential unit would have a two-car garage and driveway with additional street parking. Roadway and pedestrian facilities are depicted in Figure 3-5 above.

Utilities and Infrastructure

On-site infrastructure for the project would consist of subdivision roads, including curbs, gutters, and sidewalks, and water, sewer, and storm drainage connections and improvements. Public utilities, including potable water, sanitary sewer, stormwater drainage, power, and telecommunication services, are not currently provided on the project site. The following section describes how the proposed project would improve the site to provide standard services.

Water Service

Potable water would be distributed to the project site by an existing 12-inch Zone III trunk line beneath Heidorn Ranch Road. The line would be extended within Heidorn Ranch Road south to Sand Creek Road and west within Sand Creek Road to create a loop to connect with the 16-inch Zone III trunk line in Hillcrest Avenue.

Sanitary Sewer

If not already completed by the adjacent developer (the sewer line was previously approved and permitted for the Aviano residential project), the proposed project would extend the existing 24-inch sanitary sewer pipe, located at Heidorn Ranch Road, northeast of the project site. The pipe would be extended south along the future alignment of Heidorn Ranch Road to the project entry and west through the central Promenade to the Hillcrest Avenue entry.

Storm Water

Approximately one-third of the eastern part of the site (approximately 35 acres) would drain to the smaller proposed stormwater detention/water quality basin located within the Southeastern Park. The balance of the site would drain to the larger proposed stormwater detention/water quality basin south of Sand Creek Road. The basins would then drain through engineered outlets to Sand Creek. The basins would provide mitigation for detention, water quality, and hydromodification.

Power and Communications

Electricity to the project site would be provided by PG&E. AT&T provides telephone and internet service and Comcast and Astound provide cable television and internet services city-wide. Dry utilities, electrical, gas, and technology lines would be extended from the existing lines beneath Heidorn Ranch Road and Hillcrest Avenue and looped between the two through Sand Creek Road.

Construction

Construction of the proposed project would require grading for the proposed roads and building pads, trenching for water, sewer, and storm drainage improvements, and the construction of up to 650 single-family homes. Project grading would be balanced on-site. Construction of the proposed project would be conducted in two main phases arranged into six neighborhoods. Phase 1 of the project would most likely commence in 2017; and Phase 2 of construction is expected to be completed in 2022.

3.6 REQUIRED PUBLIC APPROVALS

The City of Antioch has discretionary authority and is the lead agency for the proposed project. The project applicant is seeking approval of the following by the City of Antioch at this time:

- *General Plan Amendment.* The project would require the approval of a General Plan Amendment of the Sand Creek Focus Area of the General Plan from Business Park, Public/Quasi-Public, and Open Space/Senior Housing designations to Medium Low Density Residential as well as amendment to the text of the Sand Creek Focus Area of the General Plan (See Figure 3-3 above and Figure 3-6 below).
- *Planned Development Rezone.* The project would require the approval of a Master Development Plan, Final Development Plan, and Planned Development Rezone. The

Development Plan and Planned Development District would establish the development standards applicable to the project site, including setbacks, lot sizes, and building heights.

- *Resource Management Plan.* Pursuant to section 4.4.6.7(t) of the City of Antioch General Plan, the applicant has submitted a Resource Management Plan for City approval.
- *Tentative Map.* Tentative Map approval is required to authorize the subdivision of the project site into multiple parcels to accommodate up to 650 single-family residential units as well as recreational, parks, and open space parcels.
- *Development Agreement.* The Development Agreement approval allows the City and an applicant to enter into an agreement, which will assure the City that the proposed project will proceed to its completion in compliance with the plans submitted by the applicant. The Development Agreement for the proposed would include a special tax or other financing mechanism to fund additional police officers needed to serve development.

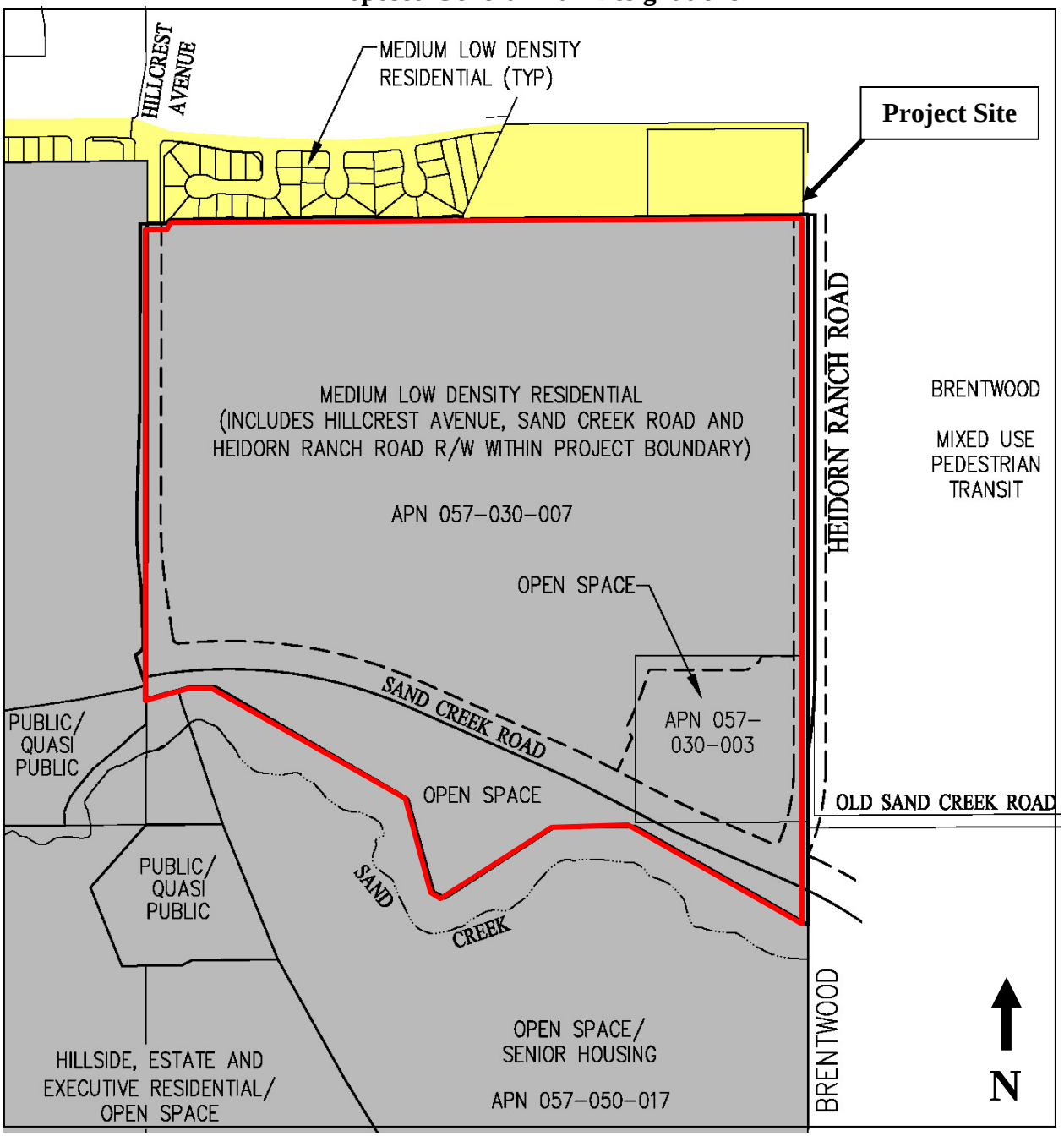
The proposed project would require the following additional City of Antioch approvals in the future:

- Approval of Use Permit for each Phase
- Approval of Design Review;
- Approval of a Grading Permit;
- Approval of Building Permits;
- Approval of a Tree Permit;
- Approval of Improvement Plans; and
- Approval of Final Map(s).

In addition to approvals from the City of Antioch, the proposed project would require the following approvals from other Responsible Agencies:

- US Army Corps of Engineers authorization to proceed under the Clean Water Act Nationwide Permit Program;
- Central Valley Regional Water Quality Control Clean Water Act section 401 Water Quality Certification;
- US Fish and Wildlife Service ESA incidental take authorization; and
- California Department Fish and Wildlife Lake and Streambed Alteration Agreement.

Figure 3-6
Proposed General Plan Designations



4. EXISTING ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION

4.0 INTRODUCTION TO THE ANALYSIS

4.0 INTRODUCTION TO THE ANALYSIS

4.0.1 INTRODUCTION

The technical chapters of the EIR analyze the potential impacts of buildout of the Vineyards at Sand Creek Project (proposed project) on a range of environmental issue areas. Chapters 4.1 through 4.11 describe the focus of the analysis, references and other data sources for the analysis, the environmental setting as the setting relates to the specific issue, project-specific impacts and mitigation measures, and the cumulative impacts of the project combined with past, present and reasonably probable future projects for each issue area. The format of each of these chapters is described at the end of this chapter. It should be noted that all technical reports are available at the City by request.

4.0.2 DETERMINATION OF SIGNIFICANCE

Under CEQA, a significant effect is defined as a substantial or potentially substantial adverse physical change in the environment (Public Resources Code § 21068; CEQA Guidelines § 15382). The Guidelines implementing CEQA direct that this determination be based on scientific and factual data to the extent possible. The specific criteria for determining the significance of a particular impact are identified within the impact discussion in each chapter, and are consistent with significance criteria set forth in Appendix G of the CEQA Guidelines.

4.0.3 ENVIRONMENTAL ISSUES ADDRESSED IN THIS EIR

This Draft EIR provides the analysis necessary to address the technical environmental impacts of the proposed project. The following environmental issues are addressed in this Draft EIR:

- Aesthetics;
- Air Quality and Greenhouse Gas Emissions;
- Biological Resources;
- Cultural Resources;
- Geology, Soils, and Mineral Resources;
- Hazards and Hazardous Materials;
- Hydrology and Water Quality;
- Land Use and Planning / Agricultural Resources;
- Noise;
- Public Services, Recreation, and Utilities; and
- Transportation and Circulation.

See Chapter 5, Section 5.3 for additional information on the scope of the cumulative impact analysis for each environmental issue addressed in the EIR.

4.0.4 TECHNICAL CHAPTER FORMAT

Each technical chapter addressing a specific environmental issue begins with an **introduction** describing the purpose of the section. The introduction is followed by a description of the project's **existing environmental setting** as the setting pertains to that particular issue. The setting description is followed by the **regulatory context** and the **impacts and mitigation measures** discussion, which contains the **standards of significance**, followed by the **method of analysis**. The **impact and mitigation** discussion includes impact statements prefaced by a number in bold-faced type (for both project-level and cumulative analyses). An explanation of each impact and an analysis of the impact's significance follow each impact statement. All mitigation measures pertinent to each individual impact follow directly after the impact statement (see below). The degree of relief provided by identified mitigation measures is also evaluated. An example of the format is shown below:

4.x-1 Statement of Impact

Discussion of impact for the proposed project in paragraph format.

Statement of ***level of significance*** of impact prior to mitigation is included at the end of each impact discussion.

Mitigation Measure(s)
Statement of *level of significance* after the mitigation is included immediately preceding mitigation measures.

4.x-1(a) *Recommended mitigation measure(s) presented in italics and numbered in consecutive order.*

4.x-1(b) *etc., etc.*

4.1 AESTHETICS

4.1 AESTHETICS

4.1.1 INTRODUCTION

The Aesthetics chapter of the EIR describes the existing visual resources of the proposed project site and vicinity. In addition, an evaluation is provided of the potential impacts of the project with respect to urbanization of the area. The CEQA Guidelines describe the concept of aesthetic resources in terms of scenic vistas, scenic resources (such as trees, rock outcroppings, and historic buildings), State scenic highways, visual character or quality of the project site, and light and glare impacts. The following impact analysis is based on information drawn from the *City of Antioch General Plan*[1] and associated EIR.[2]

4.1.2 EXISTING ENVIRONMENTAL SETTING

The following setting information provides an overview of the existing conditions of the project site and surrounding area in relation to visual resources.

Regional Setting

The City of Antioch is located in eastern Contra Costa County and is bordered to the north by the San Joaquin River Delta; to the east by the City of Brentwood and the City of Oakley; to the west by the City of Pittsburg and unincorporated portions of the County; and to the south by unincorporated portions of the County. The project site is in the southern portion of the City of Antioch, on the western side of State Route 4 (SR 4) and south of Lone Tree Way. The project site is within the northeast corner of the Sand Creek Focus Area of the General Plan. The Sand Creek Focus Area contains lands designated by the General Plan for open space and residential, business park, commercial, and mixed-use development.

According to the City of Antioch General Plan, the Sand Creek Focus Area is bounded by existing residential neighborhoods to the north, Black Diamond Mines Regional Preserve to the west, the City limits to the south, and the City of Brentwood to the east. Sand Creek and the natural hillside and canyons within the Sand Creek Focus Area contain habitats for sensitive plant and animal species. In addition, although not present on the project site, oak woodlands within the Sand Creek Focus Area are considered sensitive resources due to high wildlife value. Overall, the western portion of the Sand Creek Focus Area is more environmentally sensitive than the eastern portion in terms of steep topography, biological habitats and linkages, the existence of abandoned coal mines, and proximity to public open space at Black Diamond Mines Regional Preserve. Land has been preserved in regional parks and permanent open space, primarily in extensive grassland to the immediate west and northwest, as well as south of the Sand Creek Focus Area. The preserves represent a significant investment of public resources, and are a valued public asset.

Project Site Setting

The following section describes the existing visual character and quality of the project site, as well as the existing views offered from the site and the views of the site from the surrounding areas.

Existing Visual Character

The approximately 140-acre project site is located in Lone Tree Valley which is a four mile long valley that slopes eastward to an elevation of approximately 140 feet above sea level at the project site. Sand hills lie to the north and south of the project site and the Coast Range rises to an elevation of several thousand feet within six miles to the west. The project is bounded by a residential subdivision to the north, Sand Creek to the south, Heidorn Ranch Road and City of Brentwood City limits to the east, and future Hillcrest Avenue extension and vacant residential land to the west.

The project site has historically been used for agricultural purposes and is currently vacant. A majority of the site has been recently disked. The southeastern corner of the project site has several large trees and a gravel access road. The ten acres located on the southeastern corner of the project site has been identified as the Aera property which had several structures removed between 2009 and 2010. Sand Creek, a tributary of Marsh Creek, flows in a northeastern direction and is located south of the project site. Rock outcroppings or historic buildings do not exist on-site.

The site is generally rectangular; however, the southern boundary shifts north and south in an irregular shape. The site's terrain is generally flat and the existing topography falls from southwest to southeast at approximately one percent slope with elevations ranging from 150 to 175 feet above mean sea level. In addition, the Sand Creek drainage is incised approximately 10 to 15 feet below adjacent grade along the southern margin of the project site.[3] A relatively short slope ascends the northern margin of the site to the adjacent residential development.

Regional access to the site is provided by SR 4, Lone Tree Way, and Deer Valley Road. The nearest exit from SR 4 providing access to the project site is Lone Tree Way. Extensions of Heidorn Ranch Road and Hillcrest Avenue would provide access to the project site. Although Sand Creek Road would form the southern boundary of the developed portion of the site, vehicular access is not proposed directly from Sand Creek Road.

The project site is surrounded by a mixture of uses including existing single-family residential uses to the north; the undeveloped but approved Aviano residential project to the west, undeveloped land planned for future residential, mixed use, and commercial development in Brentwood to the east; and Sand Creek, a PG&E facility, and undeveloped farm land to the south (planned for future residential uses in the City of Antioch's General Plan). The nearest existing residential area is located adjacent to the project site to the north off of Prewett Ranch Drive.

Existing Views from the Project Site

The project site is relatively flat and has primarily unobstructed views of surrounding areas, which are described below.

North of the Project Site

Two-story single-family residences separated from the site by a wooden privacy fence are visible to the north of the project site. In addition, a rural residence is located immediately adjacent to the northern project boundary and is characterized by existing buildings, sheds, and parked cars, trucks, and boats. The residential uses to the north and northeast are visible along with associated trees and landscaping.

East of the Project Site

Agricultural lands are located across Heidorn Ranch Road to the east of the site. Views east of the site are generally of open agricultural and grasslands, SR 4, with scattered industrial and residential development. Transmission lines along SR 4 can be seen from the site. Views in this direction are generally open to the horizon.

South of the Project Site

The project site is bordered by open space to the south. From the northern portion of the site, views to the south are generally of the southern portion of the site and surrounding foothills. A north facing hill slope is located in the southernmost portion of the site, south of Sand Creek. The hill slopes upwards to an elevation of about 328 feet above mean sea level. Trees are scattered along the banks of Sand Creek and the southern hillside area of the site. From the southern hillside portion of the site, views to the south are characterized by open grasslands with scattered rural developments and the foothills of Mount Diablo.

West of the Project Site

Views immediately to the west of the project site include vacant agricultural land associated with the Aviano Farms project site. Views to the west are partially obstructed by the four-story Kaiser Medical Facility and associated structures. Unobstructed views of Mount Diablo and the surrounding foothills are visible southwest of the project site. The surrounding foothills visible from the project site are generally characterized by grasslands with scattered trees and shrubs.

Existing Views of the Project Site

Because the topography of the project site slopes upward along the northern boundary and downward along the southern boundary, the site is generally visible from all sides.
Daytime photos were taken of the project site in order to capture existing daytime views from the nearby sensitive visual receptors (discussed below). Figure 4.1-1 provides an overview of the locations from which the photographs were taken. Existing views of the project site and the surrounding areas are depicted in Figures 4.1-2 through 4.1-9. The figures represent the visual

setting of the site, the views of the surrounding areas afforded by the project site, and any unique aesthetic features on the project site.

North of the project, the site can be seen from residents and travelers near the terminus of Hillcrest Avenue. As shown in Figure 4.1-2, photographs taken at location 1 present views looking south at the project site from Hillcrest Avenue. Existing views from location 1 include grassland, a barbed-wire fence, and rolling hills topped with towers in the distance. As shown in Figure 4.1-3, photographs taken at location 2 present views looking southeast at the project site from Hillcrest Avenue. Existing views from location 2 include grassland with some hillside and scattered trees in the distance. As shown in Figure 4.1-4, photographs taken at location 3 present views looking east at the project site from Hillcrest Avenue. Existing views from location 3 include residential housing with a wooden privacy fence, grassland, and some urban development, towers, and trees in the distance.

In addition, the site can be seen from residents and travelers along Heidorn Ranch Road northeast of the project site. As shown in Figure 4.1-5, photographs taken at location 4 present views looking west at the project site from Heidorn Ranch Road. Existing views from location 4 include grassland, a barbed-wire fence with a gate, a lighting pole, parked vehicles and large trucks, and towers and trees in the distance. As shown in Figure 4.1-6, photographs taken at location 5 present views looking southwest at the project site from Heidorn Ranch Road. Existing views from location 5 include a disturbed dirt shoulder adjacent to the road, grassland, a barbed-wire fence with a gate, transmission lines, and rolling hills topped with towers in the distance. As shown in Figure 4.1-7, photographs taken at location 6 present views looking south at the project site from Heidorn Ranch Road. Existing views from location 6 include mainly grassland, Heidorn Ranch Road and the associated dirt shoulder, a barbed-wire fence along the road, transmission lines, and trees and rolling hills in the distance.

Furthermore, the site can be seen from travelers along Heidorn Ranch Road east of the project site. As shown in Figure 4.1-8, photographs taken at location 7 present views looking northwest at the project site from Heidorn Ranch Road. Existing views from location 7 include mainly disturbed grassland associated with the Aera property, a barbed-wire fence, and existing residences and associated trees in the distance. As shown in Figure 4.1-9, photographs taken at location 8 present views looking northwest at the project site from Heidorn Ranch Road. Existing views from location 8 include mainly grassland, a disturbed dirt shoulder along the road, a barbed-wire fence, and existing residences and associated trees in the distance.

Figure 4.1-1
Photo Locations and View Directions

Figure 4.1-2
Existing View from Location 1 – Looking South at the Project Site from Hillcrest Avenue

Figure 4.1-3
Existing View from Location 2 – Looking Southeast at the Project Site from Hillcrest Avenue

Figure 4.1-4
Existing View from Location 3 – Looking East at the Project Site from Hillcrest Avenue

Figure 4.1-5
Existing View from Location 4 – Looking West at the Project Site from Heidorn Ranch Road

Figure 4.1-6
Existing View from Location 5 – Looking Southwest at the Project Site from Heidorn Ranch Road

Figure 4.1-7
Existing View from Location 6 – Looking South at the Project Site from Heidorn Ranch Road

Figure 4.1-8
Existing View from Location 7 – Looking Northwest at the Project Site from Heidorn Ranch Road

Figure 4.1-9
Existing View from Location 8 – Looking Northwest at the Project Site from Heidorn Ranch Road

Sensitive Receptors

Sensitive receptors immediately to the south, east, and west of the project generally do not exist. Photographs taken at locations 1 through 6 represent views looking generally south at the project site from Heidorn Ranch Road and Hillcrest Avenue. Photographs taken at locations 7 and 8 represent views looking northwest at the project site from Heidorn Ranch Road.

As noted previously, the site's terrain is generally flat and the existing topography falls from southwest to southeast at approximately one percent slope with elevations ranging from 150 to 175 feet above mean sea level. Thus, the project site is clearly visible from travelers heading along Heidorn Ranch Road to the east. In addition, the residence adjacent to the northern boundary, as well as the residences along Sunview Court, Cedar Point Court, and Wildrose Court north of the project site, have a view of the project site. As such, the receptors most sensitive to the visual and aesthetic alteration of the project area would be the residential areas to the north, as well as travelers along Heidorn Ranch Road. Travelers along Heidorn Ranch Road are considered sensitive receptors due to the number of individuals traveling the route, and residences to the north of the site are considered sensitive due to the duration of exposure to any change, their familiarity with the existing landscape and views, and their ability to detect changes in views. It should be noted that the residences to the northwest off of Prewett Ranch Drive would also be susceptible to the changes in views resulting from the undeveloped but approved Aviano residential project to the west of the proposed project site. Any existing views of the project site from the residences off Prewett Ranch Drive and west of Hillcrest Avenue would be largely blocked by the future development of the Aviano residential project.

Scenic Highways

According to the California Department of Transportation (Caltrans), the only officially designated scenic highways within Contra Costa County are portions of Highway 24 and Interstate 680.[4] The aforementioned highways are not located within the vicinity of the project site.

4.1.3 REGULATORY CONTEXT

Applicable federal laws or regulations pertaining to the visual quality of the project area do not exist. However, the existing State and local laws and regulations are listed below, as applicable.

State Regulations

The following are the State environmental laws and policies relevant to aesthetics.

California Scenic Highway Program

The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. Such highways are identified in Section 263 et seq. of the Streets and Highways Code. SR 4 to the east of the project site is not an officially designated scenic highway.

Local Regulations

The following are the local environmental goals and policies relevant to aesthetics.

City of Antioch General Plan

The following general design goals of the *City of Antioch General Plan* are applicable to the proposed project.

Goal 5.4.2.a Base the City's review of public and private projects on the following general design principles:

- Innovative design, regardless of its style, is more important to the achievement of "quality" than the use of predetermined themes.
- "High quality" comes from the explicit consideration of all aspects of development design. It is in design details that "quality" is ultimately manifested.
- Designers need to respect community goals and needs, as well as address their client's economic objectives.
- Individual buildings and developments are not isolated entities, but are part of a larger district and community into which they must fit. While innovation and individual expression are sought, compatibility of design elements is also important.
- Standardized design solutions, "corporate architecture," and "off the shelf models" can not always be depended on. What worked before or was accepted elsewhere may not work or be acceptable in the proposed application in Antioch.
- Architectural styles, landscaping, and project amenities should complement surrounding development, and convey a sense of purpose, not expediency.
- All building elevations visible to the public should be given equal attention and detail.
- The same design solution, no matter how well done, when repeated too often or over too large an area, can become boring, lose its effectiveness, and no longer communicate "quality."

Goal 5.4.2.b Incorporate Antioch's "Gateway to the Delta" theme and reminders of its community heritage into the design of new residential, commercial, employment-generating, and recreational development, as well as into public facilities.

- Incorporate nautical/waterway, gateway/entry, industrial or ranching themes into the design details of new developments and community facilities, such as building architecture, signage, lighting standards, site paving and landscaping, street furniture (e.g., benches, trash

enclosures and receptacles), fencing, and placement of murals and sculptures in public locations.
- Maintain a consistent design theme throughout each development project. Each individual development project and area within the project should portray an identifiable design theme.
- Select tree species that are appropriate to their specific applications (e.g., providing shade, framing long-distance views of the San Joaquin River or Mt. Diablo, or framing short-distance views of new development).

Goal 5.4.2.c Maintain view corridors from public spaces to natural ridgelines and landmarks, such as Mt. Diablo and distant hills, local ridgelines, the San Joaquin River, and other water bodies.

- Recognize that new development will inevitably result in some loss of existing views, as part of the City's review of development and commercial and industrial landscape plans, minimize the loss of views from public spaces.
- Important view corridors to be protected include Somersville Road, Lone Tree Way, Hillcrest Avenue, SR 4, SR 160, James Donlon Boulevard, Deer Valley Road, and Empire Mine Road.

Goal 5.4.2.d Strengthen and emphasize community focal points, visual landmarks, and features contributing to Antioch's identity using design concepts and standards implemented through the zoning ordinance, design guidelines and design review process, and specific plan and planned community documents.

Goal 5.4.2.e Create a framework of public spaces at the neighborhood, community, and regional scale.

- Provide for new open space opportunities throughout the City, especially in neighborhoods having minimal access to open space. This includes exploring the potential for creek corridors, bicycle and pedestrian paths, and new small open space and conservation areas.
- Provide an open space network linked by pedestrian and bicycle paths, which preserves and enhances Antioch's significant visual and natural resources.
- Provide sitting areas within parks and along pedestrian and bicycle paths.
- Utilize existing creeks, such as Sand Creek, as linear parks, providing pedestrian and bicycle paths.
- Views along utility corridors should be retained and enhanced through the use of planting materials to frame and focus views and to provide a sense of orientation.

Goal 5.4.2.f Provide for consistent use of street trees to identify City streets, residential neighborhoods, commercial and employment districts, and entry points to the City.

- Select species that enhance the pedestrian character of, and convey a distinctive and high quality visual image for the City's streets; are draught-tolerant, fire- and pest-resistant; and complement existing street trees.
- Use changes in tree species, scale, color and spacing to differentiate the roadway types identified in the Circulation Element.
- Use a consistent palette of street trees to distinguish Antioch from other communities, and to distinguish individual areas within the community (e.g., Rivertown, East Lone Tree, "A" Street Corridor) from each other.
- Street trees should relate to the scale, function, and visual importance of the area in which they are located, establishing a hierarchy of street trees for entry locations, intersections, and activity centers.
  - Major accent trees are to be located at City and community entry locations, key intersections, and major activity centers (e.g., County East Mall, Prewett Family Park).
  - Street trees should be selected as a common tree for street frontages. A single species may be selected for all residential neighborhoods or different species to distinguish different neighborhoods from each other. Within residential neighborhoods, street trees should be full, providing shade and color. In commercial districts, the trees should provide shade but be more transparent at the motorist and pedestrian levels to promote views of store fronts and visual interaction of pedestrians. Within employment districts street trees should provide shade and screening, and be used to frame views of buildings and building entries.

Goal 5.4.2.g Maintain common community design elements throughout the City.

- Provide a system of well-designed directional signage, facilitating way-finding to community features such as shopping areas, marinas, parks, and civic buildings.
- Incorporate common design elements in community features such as roadway landscaping, streetlights, street signs, traffic lights, and community directional signage.
- Use design variations in landscaping, street light standards, and street signs as a means of defining special design districts (e.g., Rivertown, Somersville Road and "A" Street corridors).

Goal 5.4.2.h Wherever feasible, existing above-ground utility lines should be placed underground.

Goal 5.4.2.o Design on-site lighting to improve the visual identification of adjacent structures.

- In all projects, lighting fixtures should be attractively designed and of a low profile to complement the overall design theme of the project within which they are located.
- On-site lighting shall create a safe environment, adhering to established crime prevention standards, but shall not result in nuisance levels of light or glare on adjacent properties. Limit sources of lighting to the minimum required to ensure safe circulation and visibility.

Goal 5.4.2.p Lighting should accommodate night use of streets and promote security while complying with the provision of a dark night sky. Streetscape areas that are used by pedestrians at night should be well lit. Within rural and open space areas, limit street lighting to intersections and other locations that are needed to maintain safe access (e.g., sharp curves).

City of Antioch Design Review

The project is subject to the City of Antioch's Design Review process. According to Section 9-5.2701 of the City Zoning Code, the purpose of design review is to "…promote the orderly and harmonious development of the city, the stability of land values and investments, and the general welfare and to encourage and promote the highest quality of design and site planning to delight the user and others who come in contact with uses and structures in the city." The Planning Commission will review the design of the proposed project to ensure its consistency with the Citywide Design Guidelines. Said review process will ensure that the proposed project is aesthetically pleasing.

It is also important to note that Section 9-5.1715 of the Zoning Code includes design guidelines for outdoor lighting. The City will review the proposed design for the project's outdoor lighting to ensure that the design complies with the City's lighting guidelines.

City of Antioch Citywide Design Guidelines

The project is subject to the City of Antioch's Citywide Design Guidelines. The Guidelines apply to Rivertown (the City's traditional city center), commercial, business park, mixed-use, and residential developments, as well as sign, streetscape, and sustainable design. According to the City of Antioch Citywide Design Guidelines, the Guidelines attempt to achieve the following goals based on those outlined in the City's General Plan:[5]

- Preserve and enhance Antioch's identity as a community with small city charm and big city opportunities, while maintaining existing community values;

- Create opportunities to attract residential, commercial and recreational projects that will stimulate the economy and create an exciting live-work-play environment;
- Define standards and provide guidance for the design of new development that will encourage exceeding the desired design quality;
- Encourage architectural and landscaping criteria that stimulate walking, facilitate bicycling and reduce dependence on the automobile;
- Protect and maintain the quality and unique heritage and historical characteristics of the community and ensure compatible design standards for new projects;
- Guide the revitalization of existing developed areas blending seamlessly the quality of newer and older portions of the community;
- Establish diverse, highly effective programs that instill community pride and produce tangible local benefits for years to come; and
- Communicate a clear public vision for the community.

The Citywide Design Guidelines are utilized during the City's development review process in order to implement the highest level of design quality. The Citywide Design Guidelines Manual also provides flexibility necessary to respond to existing site conditions.

4.1.4 IMPACTS AND MITIGATION MEASURES

This section describes the standards of significance and methodology utilized to analyze and determine the proposed project's potential impacts related to aesthetics.

Standards of Significance

Consistent with Appendix G of the CEQA Guidelines, the City's General Plan, and professional judgment, a significant impact would occur if the proposed project would result in the following:

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

Method of Analysis

The analysis of impacts gives full consideration to the development of the project site and acknowledges the physical changes to the existing setting. Impacts to the existing environment of the project site are to be determined by the contrast between the site's visual setting before and after the proposed development. Although few standards exist to singularly define the various individual perceptions of aesthetic value from person to person, the degree of visual change could be measured and described in a reasonably objective manner in terms of visibility and visual contrast, dominance, and magnitude.

As discussed above, the receptors most sensitive to the visual and aesthetic alteration of the project area would be the residential area to the north, as well as travelers along Heidorn Ranch Road.

Project-Specific Impacts and Mitigation Measures

The following discussion of aesthetics impacts is based on implementation of the proposed project in comparison to existing conditions and the standards of significance presented above.

4.1-1 Substantial adverse effect on a scenic vista. Based on the analysis below, the impact is *less than significant.*

Typically, a scenic vista is associated with views of an ocean, mountains, hills, lakes, rivers, canyons, open spaces, and other natural features. The project would not affect any views of an ocean, lake, river, or canyon.

After development, the project site would remain relatively flat. Although the foothills and Mount Diablo are in the project view shed, the distant views of the natural topography in the area would remain after project development. Many areas of the project site would maintain vantage points to the nearby foothills.

Therefore, overall, the proposed project would not have a substantial adverse effect on a scenic vista, and impacts would be considered ***less than significant***.

Mitigation Measure(s)
None required.

4.1-2 Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway. Based on the analysis below, the project would have *no impact.*

SR 4, which is the nearest State highway to the project area, is not a designated State scenic highway within the vicinity of the project site. As noted previously, the only officially designated scenic highways within Contra Costa County are portions of Highway 24 and Interstate 680. The aforementioned highways are not located within the vicinity of the project site. The proposed project would not result in the removal rock outcroppings or historic resources, nor would it substantially damage scenic resources within a State scenic highway. Rock outcroppings, historic buildings, or other scenic resources do not exist on-site. Thus, such resources would not be adversely affected by the project.

It should be noted that a total of 47 trees are located on the project site and off-site improvement areas.[6] Construction of the project would require removal of seven mature trees and 26 established trees, as those terms are defined by the city's Tree Preservation and Regulation ordinance. In addition, the project would require removal of one

landmark tree. The landmark tree is non-native and is in poor health. This landmark tree will decline regardless of treatment. Impacts related to the loss of trees are addressed in Chapter 4.3, Biological Resources, and mitigation is required to ensure removed trees are replaced and existing trees to be preserved are protected from damage. Because the project site is not visible from a State scenic highway, the loss of trees on the project site will not result in substantial damage to scenic resources. Further, compliance with the Tree Preservation and Regulation Ordinance will ensure that a significant visual impact does not occur. Therefore, the project would not substantially damage any scenic resources within a State scenic highway, and ***no impact*** would occur.

Mitigation Measure(s)
None required.

4.1-3 Degradation of the existing visual character or quality of the project site and/or the site's surroundings. Based on the analysis below, the impact is *less than significant*.

The proposed project includes the development of up to 650 single-family residential units on 127.5 acres; 31.6 acres of parks and landscaped areas; extension of Heidorn Ranch Road, Hillcrest Avenue, and Sand Creek Road; extension of a portion of the Sand Creek Trail for connection to other City and regional trails; and utility improvements. Development of the project site would alter the visual character of the project site from agricultural to residential. However, the residential uses would be similar to the existing residential uses to the north.

As discussed above, the receptors most sensitive to the visual and aesthetic modification of the project site would be the residential area to the north, as well as travelers along Heidorn Ranch Road. Travelers along Heidorn Ranch Road are considered sensitive receptors due to the number of individuals traveling the route, and residences to the north of the site are considered sensitive due to the duration of exposure to any change, their familiarity with the existing landscape and views, and their ability to detect changes in views.

Figures 4.1-2 through 4.1-9 illustrate existing views of the project site and surrounding areas. As shown in the figures, the project site is currently vacant and is surrounded by vacant land to the east, south, and west. Once the undeveloped but approved Aviano residential project to the west is completed, the residences to the north would no longer have views of the project site.

Development of the project would include the removal of agricultural vegetation on-site, causing the visual character of the site to be permanently altered. However, the project design would incorporate new open-spaces and landscaping to increase the aesthetic quality of the project, and would thereby reduce the impacts the project would have on the conversion of the site to an urban setting. In addition, landscaping would be designed to be consistent with the goals and policies found in the Antioch General Plan.

The open areas of the site would be landscaped with trees, shrubs, flowers and grasses.

Landscaping would be strategically located to minimize the visual impact of the buildings, especially where development abuts open space areas. Although vegetation would not completely shield the proposed project from view, the use of vegetation would screen the project and assist in the partial retention of the present natural character of views in the area.

Although the proposed project would alter the existing visual character of the site and surrounding area, the proposed project site is located near existing areas of development to the north. Issues applicable to the proposed project, such as street design, sidewalks and planter strips, grading and drainage, landscaping, architecture and site design (including building materials and colors), fences and walls, and lighting, would be reviewed by the Planning Commission as part of the proposed Planned Development standards.

The Master Development Plan and Planned Development District would establish the development standards applicable to the project site, including setbacks, lot sizes, and building heights. Design guidelines and development standards have been created specifically for the proposed project and cover topics such as circulation, building placement, grading and drainage, architectural style, building finishes and materials, landscaping, fencing, and more. Landscaping would be provided throughout the project site on a total of approximately 31.6 acres and would consist of street trees, shrubs, groundcover, agricultural plantings, and open lawn areas. The landscaping adjacent to Heidorn Ranch Road, Hillcrest Avenue, and Sand Creek Road would consist of rows of vineyards. In addition, approximately 5.7 acres of open space would be included around and adjacent to the detention basin located south of Sand Creek Road. A segment of the Sand Creek Regional Trail would be constructed within the project site. The trail would connect to the planned trail to the west and would transition to the public sidewalk to the east along Sand Creek Road.

The proposed residential homes would incorporate articulation of the front and visible (end-of-block) facades, including variation in massing, roof forms, and wall planes, as well as surface articulation. The second stories of the residences would be designed to reduce the appearance of the overall scale of the structure. The building's gutters and downspouts, unless designed as an outstanding architectural feature of the overall theme, would be colored to match the body color. Various roof forms and changes in roof plane on all structure elevations visible from a public street or pedestrian right-of-way would be utilized.

As summarized in the Regulatory Context section above, the Citywide Design Guidelines include key design principles and issues that the Planning Commission and staff will use in evaluating development plans for projects in the City. Key design principles and issues in the Citywide Design Guidelines that would be applicable to the proposed project include, but are not limited to, street design, sidewalks and planter strips, grading and drainage, landscaping, architecture (including building materials and colors), site design, fences and walls, and lighting. Consistency with the Citywide Design Guidelines would be ensured during the design review process.

Due to the proposed project's location near existing residential development, the Citywide Design Guidelines, and the project-specific design guidelines, the proposed project would not be expected to substantially degrade the existing visual character or quality of the project site or surrounding area. Therefore, consistent with the General Plan EIR, impacts to the existing visual character or quality of the site and surrounding areas would be ***less than significant***.

Mitigation Measure(s)
None required.

4.1-4 Creation of new sources of substantial light or glare that would adversely affect day or nighttime views in the area. Based on the analysis below and with implementation of mitigation, the impact would be *less than significant*.

The proposed project includes the development of up to 650 single-family residential units on 127.5 acres; 31.6 acres of parks and landscaped areas; extension of Heidorn Ranch Road, Hillcrest Avenue, and Sand Creek Road; extension of a portion of the Sand Creek Trail for connection to other City and regional trails with associated parking; and utility improvements. Development of the project would create new sources of light and glare that could adversely affect day and nighttime views in the area.

The City of Antioch Zoning Code has requirements for lighting and glare to reduce the impacts of glare and light trespass. The Zoning Code states that minimum illumination at ground level shall be two foot-candles but shall not exceed one-half foot-candles in a residential district. The Antioch General Plan EIR determined that the impact of new sources of light and glare can be minimized by incorporating design features and operating requirements into new developments that limit light and glare. Although the General Plan does not contain specific policies that would minimize light and glare, Mitigation Measures 4.1.2A through 4.1.2D included in the General Plan EIR would ensure that new development would not result in substantial light and glare impacts.

The Antioch General Plan EIR concluded that with implementation of mitigation, light and glare from new development that is contiguous with existing development would be less-than-significant. Therefore, without mitigation to ensure design features to minimize the effects of light and glare are implemented, development of the proposed project would result in a ***potentially significant*** impact related to light and glare.

Mitigation Measure(s)
Implementation of the following mitigation measure consistent with the General Plan EIR would reduce the above impact to a *less-than-significant* level.

4.1-4 *Prior to approval of Improvement Plans that include street lights, the City of Antioch's Engineering Division shall review and approve the lighting specifications to ensure that lighting fixtures comply with the Zoning Code's requirements for minimum and maximum ground level illumination. In addition, prior to approval of building permits for new*

structures that include exterior lighting, the City of Antioch's Planning Division shall review and approve the exterior lighting specifications to ensure exterior lighting is of a low profile and intensity.

Cumulative Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in combination with other proposed and pending projects in the region. Other proposed and pending projects in the region under the cumulative context would include buildout of the City's General Plan, as well as development of the most recent planned land uses within the vicinity of the project area, including the approved and currently being modified Aviano residential project.

4.1-5 Long-term changes in visual character of the region associated with cumulative development of the proposed project in combination with future buildout in the City of Antioch. Based on the analysis below, the impact is *less than cumulatively significant.*

The Antioch General Plan EIR determined that as the City of Antioch continues to expand, future development could alter landforms, scenic vantage points, and the overall character of the City. The proposed project would contribute to the cumulative change in visual character within the City of Antioch. Residential subdivisions are located to the north and are approved to the west of the project site, and agricultural land designated for development is located to the east. The Antioch General Plan has designated the areas south and west the project site for urban development. The area east of the project site and west of SR 4 is designated by the Brentwood General Plan for Mixed Use Pedestrian Transit uses. Therefore, in terms of the change to the visual character of the project area, development on the project site would be typical of what is anticipated to occur around the project site. Development in the City, in addition to the development on the project site, would contribute to a change in the visual character of the area.

The General Plan EIR addressed build-out of the plan area, which included the project site, and concluded that, with implementation of policies included in the General Plan, converting vacant land to urban use would not create a significant impact. While the General Plan EIR contemplated business park uses on the majority of the project site, development with residential uses would not change EIR's conclusion. Both uses are considered to be urbanization of vacant land, with similar visual effects. Therefore, the conversion of the project site, in addition to other lands in the project area, to an urban setting would be considered ***less than cumulatively significant***.

Mitigation Measure(s)
None required.

Endnotes

[1] City of Antioch. *City of Antioch General Plan*. Updated November 24, 2003.
[2] City of Antioch. *Draft General Plan Update Environmental Impact Report*. July 2003.
[3] Geocon Consultants, Inc. *Promenade – Planned Residential Development, Heidorn Ranch Roach, Antioch, California, Geotechical Peer Review.* August 26, 2014.
[4] California Department of Transportation, 2007. California Scenic Highway Program. Website: www.dot.ca.gov/hq/LandArch/scenic/schwy.html. April 9.
[5] City of Antioch. *Citywide Design Guidelines Manual*. October 2009.
[6] Stewart's Tree Service, Inc. *Tree Survey. Sand Creek Ranch Property.* July 17, 2014.

4.2 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

4.2 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

4.2.1 INTRODUCTION

The Air Quality and Greenhouse Gas Emissions chapter of this EIR describes the effects of the proposed project on local and regional air quality. The chapter includes a discussion of the existing air quality and greenhouse gas (GHG) setting, construction-related air quality impacts resulting from grading and equipment emissions, direct and indirect emissions associated with the project, the impacts of these emissions on both the local and regional scale, and mitigation measures warranted to reduce or eliminate any identified significant impacts. The chapter utilizes information obtained from the *City of Antioch General Plan*[1] and associated EIR,[2] the California Emissions Estimator Model (CalEEMod) version 2013.2.2,[3] and is primarily based on information, guidance, and analysis protocol provided by the Bay Area Air Quality Management District (BAAQMD).

4.2.2 EXISTING ENVIRONMENTAL SETTING

The following information provides an overview of the existing environmental setting in relation to air quality within the proposed project area. Air basin characteristics, ambient air quality standards (AAQS), attainment status and regional air quality plans, local air quality monitoring, odors, sensitive receptors, and greenhouse gases are discussed.

Air Basin Characteristics

The project site is located in the eastern portion of the nine-county San Francisco Bay Area Air Basin (SFBAAB), and is within the jurisdictional boundaries of the BAAQMD. The SFBAAB consists of coastal mountain ranges, inland valleys, and bays. The proposed project is located on the south side of the San Joaquin River delta, east of the Carquinez Strait, and would be considered to be within the Carquinez Strait region of the SFBAAB. Being located between the greater Bay Area and the Central Valley has great influence on the climate and air quality of the area. During the summer and fall months, marine air is drawn eastward through the Carquinez Strait, with common wind speeds of 15 to 20 miles per hour throughout the region. The general west-to-east flow of the winds in the straits tends to move pollutants east. Thus, the winds dilute pollutants and transport them away from the area, so that emissions released in the project area have more influence on air quality in the Sacramento and San Joaquin Valleys than locally. However, stationary sources located in upwind cities could influence the local air quality.

Average daily maximum temperatures (in degrees Fahrenheit) are in the mid to high 50s in the winter and the high 80s in the summer. Average minimum temperatures are in the high 30s to low 40s in the winter and the mid-50s in the summer. Rainfall amounts in the region vary from 13 inches annually in Antioch to 22 inches annually in Fairfield.

Ambient Air Quality Standards

The federal Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (USEPA) to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants, known as criteria pollutants, because the criteria air pollutants could be detrimental to human health and the environment. The criteria pollutants include particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead. Primary standards are the set of limits based on human health, and secondary standards are the set of limits intended to prevent environmental and property damage. States may also establish their own ambient air quality standards, provided the State standards are at least as stringent as the NAAQS. California has established California Ambient Air Quality Standards (CAAQS) pursuant to Health and Safety Code Section 39606(b) and its predecessor statutes. The State of California has established air quality standards for some pollutants not addressed by federal standards, including hydrogen sulfide, sulfates, vinyl chloride, and visibility reducing particles.

The NAAQS and CAAQS summarized in Table 4.2-1 represent safe levels that avoid specific adverse health effects. A summary of the pollutants, their characteristics, health effects, and typical sources is provided in Table 4.2-2, followed by brief descriptions of each criteria pollutant. Of the pollutants, particle pollution and ground-level ozone are the most widespread health threats.

Ozone

Ozone is a reactive gas consisting of three oxygen atoms. In the troposphere, ozone is a product of the photochemical process involving the sun's energy, and is a secondary pollutant formed as a result of a complex chemical reaction between reactive organic gases (ROG) and NO_X emissions in the presence of sunlight. As such, unlike other pollutants, ozone is not released directly into the atmosphere from any sources. In the stratosphere, ozone exists naturally and shields Earth from harmful incoming ultraviolet radiation. The primary source of ozone precursors is mobile sources, including cars, trucks, buses, construction equipment, and agricultural equipment.

Ground-level ozone reaches the highest level during the afternoon and early evening hours. High levels occur most often during the summer months. Ground-level ozone is a strong irritant that could cause constriction of the airways, forcing the respiratory system to work harder in order to provide oxygen. Ozone at the Earth's surface causes numerous adverse health effects and is a major component of smog. High concentrations of ground level ozone can adversely affect the human respiratory system and aggravate cardiovascular disease and many respiratory ailments.

Reactive Organic Gas

Reactive Organic Gas (ROG) is a reactive chemical gas composed of hydrocarbon compounds typically found in paints and solvents that contributes to the formation of smog and ozone by involvement in atmospheric chemical reactions. A separate health standard does not exist for ROG. However, some compounds that make up ROG are toxic, such as the carcinogen benzene.

Table 4.2-1
Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS	NAAQS	
			Primary	Secondary
Ozone	1 Hour	0.09 ppm	-	Same as primary
	8 Hour	0.070 ppm	0.075 ppm	
Carbon Monoxide	8 Hour	9 ppm	9 ppm	-
	1 Hour	20 ppm	35 ppm	
Nitrogen Dioxide	Annual Mean	0.030 ppm	53 ppb	Same as primary
	1 Hour	0.18 ppm	100 ppb	-
Sulfur Dioxide	24 Hour	0.04 ppm	-	-
	3 Hour	-	-	0.5 ppm
	1 Hour	0.25 ppm	75 ppb	-
Respirable Particulate Matter (PM_{10})	Annual Mean	20 ug/m^3	-	Same as primary
	24 Hour	50 ug/m^3	150 ug/m^3	
Fine Particulate Matter ($PM_{2.5}$)	Annual Mean	12 ug/m^3	12 ug/m^3	15 ug/m^3
	24 Hour	-	35 ug/m^3	Same as primary
Lead	30 Day Average	1.5 ug/m^3	-	-
	Calendar Quarter	-	1.5 ug/m^3	Same as primary
Sulfates	24 Hour	25 ug/m^3	-	-
Hydrogen Sulfide	1 Hour	0.03 ppm	-	-
Vinyl Chloride	24 Hour	0.010 ppm	-	-
Visibility Reducing Particles	8 Hour	see note below	-	-

ppm = parts per million
ppb = parts per billion
µg/m^3 = micrograms per cubic meter

Note: Statewide Visibility Reducing Particle Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

Source: California Air Resources Board. Ambient Air Quality Standards. June 4, 2013. Available at: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed January 2015.[4]

Table 4.2-2
Summary of Criteria Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
Ozone	A highly reactive gas produced by the photochemical process involving a chemical reaction between the sun's energy and other pollutant emissions. Often called photochemical smog.	• Eye irritation • Wheezing, chest pain, dry throat, headache, or nausea • Aggravated respiratory disease such as emphysema, bronchitis, and asthma	Combustion sources such as factories, automobiles, and evaporation of solvents and fuels.
Carbon Monoxide	An odorless, colorless, highly toxic gas that is formed by the incomplete combustion of fuels.	• Impairment of oxygen transport in the bloodstream • Impaired vision, reduced alertness, chest pain, and headaches • Can be fatal in the case of very high concentrations	Automobile exhaust, combustion of fuels, and combustion of wood in woodstoves and fireplaces.
Nitrogen Dioxide	A reddish-brown gas that discolors the air and is formed during combustion of fossil fuels under high temperature and pressure.	• Lung irrigation and damage • Increased risk of acute and chronic respiratory disease	Automobile and diesel truck exhaust, industrial processes, and fossil-fueled power plants.
Sulfur Dioxide	A colorless, irritating gas with a rotten egg odor formed by combustion of sulfur-containing fossil fuels.	• Aggravation of chronic obstruction lung disease • Increased risk of acute and chronic respiratory disease	Diesel vehicle exhaust, oil-powered power plants, and industrial processes.
Particulate Matter (PM_{10} and $PM_{2.5}$)	A complex mixture of extremely small particles and liquid droplets that can easily pass through the throat and nose and enter the lungs.	• Aggravation of chronic respiratory disease • Heart and lung disease • Coughing • Bronchitis • Chronic respiratory disease in children • Irregular heartbeat • Nonfatal heart attacks	Combustion sources such as automobiles, power generation, industrial processes, and wood burning. Also from unpaved roads, farming activities, and fugitive windblown dust.
Lead	A metal found naturally in the environment as well as in manufactured products.	• Loss of appetite, weakness, apathy, and miscarriage • Lesions of the neuromuscular system, circulatory system, brain, and gastrointestinal tract	Industrial sources and combustion of leaded aviation gasoline.

Sources:

- *California Air Resources Board. California Ambient Air Quality Standards (CAAQS). Available at: http://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm. Accessed January 2015.*[5]
- *Sacramento Metropolitan, El Dorado, Feather River, Placer, and Yolo-Solano Air Districts, Spare the Air website. Air Quality Information for the Sacramento Region. Available at: http://www.sparetheair.com/health.cfm?page=healthoverall. Accessed January 2015.*[6]
- *California Air Resources Board. Glossary of Air Pollution Terms. Available at: http://www.arb.ca.gov/html/gloss.htm. Accessed January 2015.*[7]

Oxides of Nitrogen

Oxides of Nitrogen (NO_X) are a family of gaseous nitrogen compounds and are precursors to the formation of ozone and particulate matter. The major component of NO_X, nitrogen dioxide (NO_2), is a reddish-brown gas that discolors the air and is toxic at high concentrations. NO_X results primarily from the combustion of fossil fuels under high temperature and pressure. On-road and off-road motor vehicles and fuel combustion are the major sources of NO_X. NO_X reacts with ROG to form smog, which could result in adverse impacts to human health, damage the environment, and cause poor visibility. Additionally, NO_X emissions are a major component of acid rain. Health effects related to NO_X include lung irritation and lung damage and can cause increased risk of acute and chronic respiratory disease.

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless, poisonous gas produced by incomplete burning of carbon-based fuels such as gasoline, oil, and wood. When CO enters the body, the CO combines with chemicals in the body, which prevents blood from carrying oxygen to cells, tissues, and organs. Symptoms of exposure to CO can include problems with vision, reduced alertness, and general reduction in mental and physical functions. Exposure to CO can result in chest pain, headaches, reduced mental alertness, and death at high concentrations.

Sulfur Dioxide

Sulfur Dioxide is a colorless, irritating gas with a rotten egg odor formed primarily by the combustion of sulfur-containing fossil fuels from mobile sources, such as locomotives, ships, and off-road diesel equipment. SO_2 is also emitted from several industrial processes, such as petroleum refining and metal processing. Similar to airborne NO_X, suspended sulfur oxide particles contribute to poor visibility. The sulfur oxide particles are also a component of PM_{10}.

Particulate Matter

Particulate matter, also known as particle pollution or PM, is a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health impacts. The USEPA is concerned about particles that are 10 micrometers in diameter or smaller because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, the particles could affect the heart and lungs and cause serious health effects. USEPA groups particle pollution into three categories based on their size and where they are deposited:

- "Inhalable coarse particles ($PM_{2.5-10}$)," which are found near roadways and dusty industries, are between 2.5 and 10 micrometers in diameter. $PM_{2.5-10}$ is deposited in the thoracic region of the lungs.
- "Fine particles ($PM_{2.5}$)," which are found in smoke and haze, are 2.5 micrometers in diameter and smaller. $PM_{2.5}$ particles could be directly emitted from sources such as forest fires, or could form when gases emitted from power plants, industries, and

automobiles react in the air. They penetrate deeply into the thoracic and alveolar regions of the lungs.

- "Ultrafine particles (UFP)," which are very, very small particles (less than 0.1 micrometers in diameter) largely resulting from the combustion of fossil fuels, meat, wood, and other hydrocarbons. While UFP mass is a small portion of $PM_{2.5}$, their high surface area, deep lung penetration, and transfer into the bloodstream could result in disproportionate health impacts relative to their mass. UFP is not currently regulated separately, but is analyzed as part of $PM_{2.5}$.

PM_{10}, $PM_{2.5-10}$, and UFP include primary pollutants (emitted directly to the atmosphere) as well as secondary pollutants (formed in the atmosphere by chemical reactions among precursors). Generally speaking, $PM_{2.5}$ and UFP are emitted by combustion sources like vehicles, power generation, industrial processes, and wood burning, while PM_{10} sources include the same sources plus roads and farming activities. Fugitive windblown dust and other area sources also represent a source of airborne dust. Long-term PM pollution, especially fine particles, could result in significant health problems including, but not limited to, the following: increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing; decreased lung function; aggravated asthma; development of chronic respiratory disease in children; development of chronic bronchitis or obstructive lung disease; irregular heartbeat; heart attacks; and increased blood pressure.

Lead

Lead is a relatively soft and chemically resistant metal that is a natural constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, and, thus, essentially persists forever. Lead forms compounds with both organic and inorganic substances. As an air pollutant, lead is present in small particles. Sources of lead emissions in California include a variety of industrial activities. Gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels. The use of leaded fuel has been mostly phased out, with the result that ambient concentrations of lead have dropped dramatically. However, because lead was emitted in large amounts from vehicles when leaded gasoline was used, lead is present in many soils (especially urban soils) and could become re-suspended into the air.

Because lead is only slowly excreted, exposures to small amounts of lead from a variety of sources could accumulate to harmful levels. Effects from inhalation of lead near the level of the ambient air quality standard include impaired blood formation and nerve conduction. Lead can adversely affect the nervous, reproductive, digestive, immune, and blood-forming systems. Symptoms could include fatigue, anxiety, short-term memory loss, depression, weakness in the extremities, and learning disabilities in children. Lead also causes cancer.

Sulfates

Sulfates are the fully oxidized ionic form of sulfur and are colorless gases. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. The sulfur is oxidized to sulfur dioxide (SO_2) during the combustion process

and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features.

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

Hydrogen Sulfide

Hydrogen Sulfide (H_2S) is associated with geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations. Hydrogen sulfide is extremely hazardous in high concentrations; especially in enclosed spaces (800 ppm can cause death).

Vinyl Chloride

Vinyl Chloride (C_2H_3Cl, also known as VCM) is a colorless gas that does not occur naturally, but is formed when other substances such as trichloroethane, trichloroethylene, and tetrachloro-ethylene are broken down. Vinyl chloride is used to make polyvinyl chloride (PVC) which is used to make a variety of plastic products, including pipes, wire and cable coatings, and packaging materials.

Visibility Reducing Particles

Visibility Reducing Particles are a mixture of suspended particulate matter consisting of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. The standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are also a category of environmental concern. TACs are present in many types of emissions with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least 40 different TACs. In terms of health risks, the most volatile contaminants are diesel particulate matter (DPM), benzene, formaldehyde, 1,3-butadiene and acetaldehyde. Gasoline vapors contain several TACs, including benzene, toluene, and xylenes. Public exposure to TACs can result from emissions from normal operations as well as accidental releases.

Health risks from TACs are a function of both the concentration of emissions and the duration of exposure, which typically are associated with long-term exposure and the associated risk of contracting cancer. Health effects of exposure to TACs other than cancer include birth defects,

neurological damage, and death. Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State, and federal level. The identification, regulation, and monitoring of TACs is relatively new compared to that for criteria air pollutants that have established AAQS. TACs are regulated or evaluated on the basis of risk to human health rather than comparison to an AAQS or emission-based threshold.

Attainment Status and Regional Air Quality Plans

Areas not meeting the NAAQS presented above are designated by the USEPA as nonattainment. Further classifications of nonattainment areas are based on the severity of the nonattainment problem, with marginal, moderate, serious, severe, and extreme nonattainment classifications for ozone. Nonattainment classifications for PM range from marginal to serious. The CAA requires areas violating the NAAQS to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The SIP contains the strategies and control measures for states to use to attain the NAAQS. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, rules, and regulations of air basins as reported by the agencies with jurisdiction over them. The USEPA reviews SIPs to determine if they conform to the mandates of the federal CAA amendments and would achieve air quality goals when implemented.

The CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA) of 1988. The CCAA classifies ozone nonattainment areas as moderate, serious, severe, and extreme based on severity of violations of CAAQS. For each nonattainment area classification, the CCAA specifies air quality management strategies that must be adopted. For all nonattainment areas, attainment plans are required to demonstrate a five-percent-per-year reduction in nonattainment air pollutants or their precursors, averaged every consecutive three-year period, unless an approved alternative measure of progress is developed. Air districts with air quality that is in violation of CAAQS are required to prepare an air quality attainment plan that lays out a program to attain the CCAA mandates.

Table 4.2-3 presents the current attainment status of the jurisdictional area of the BAAQMD. As shown in the table, the SFBAAB area is currently designated as a nonattainment area for the State and federal ozone, State and federal $PM_{2.5}$, and State PM_{10} standards. The SFBAAB is designated attainment or unclassified for all other AAQS. It should be noted that on January 9, 2013, the USEPA issued a final rule to determine that the Bay Area has attained the 24-hour $PM_{2.5}$ NAAQS. Nonetheless, the Bay Area must continue to be designated as nonattainment for the $PM_{2.5}$ NAAQS until such time as the BAAQMD submits a redesignation request and a maintenance plan to the USEPA, and USEPA approves the proposed redesignation.

In compliance with regulations, the BAAQMD periodically prepares and updates air quality plans that provide emission reduction strategies to achieve attainment of the AAQS, including control strategies to reduce air pollutant emissions via regulations, incentive programs, public education, and partnerships with other agencies. The current air quality plans are prepared in cooperation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG).

Table 4.2-3
Attainment Status Designations

Pollutant	Averaging Time	California Standards	Federal Standards
Ozone	1 Hour	Nonattainment	-
	8 Hour	Nonattainment	Nonattainment
Carbon Monoxide	8 Hour	Attainment	Attainment
	1 Hour	Attainment	Attainment
Nitrogen Dioxide	Annual Mean	-	Attainment
	1 Hour	Attainment	Unclassified
Sulfur Dioxide	Annual Mean	-	Attainment
	24 Hour	Attainment	Attainment
	1 Hour	Attainment	Attainment
Particulate Matter (PM_{10})	Annual Mean	Nonattainment	-
	24 Hour	Nonattainment	Unclassified
Fine Particulate Matter ($PM_{2.5}$)	Annual Mean	Nonattainment	Attainment
	24 Hour	-	Nonattainment
Sulfates	24 Hour	Attainment	-
Lead	30 Day Average	-	Attainment
	Calendar Quarter	-	Attainment
Hydrogen Sulfide	1 Hour	Unclassified	-
Vinyl Chloride	24 Hour	Unclassified	-

Source: BAAQMD, http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm, accessed February 2015.[8]

The most recent federal ozone plan is the 2001 Ozone Attainment Plan, which is a proposed revision to the Bay Area part of the SIP to achieve the federal ozone standard.[9] The plan was adopted on October 24, 2001 and approved by the CARB on November 1, 2001. The plan was submitted to the USEPA on November 30, 2001 for review and approval as a revision to the SIP. The most recent State ozone plan is the 2010 Clean Air Plan (CAP), adopted on September 15, 2010.[10] The 2010 CAP was developed as a multi-pollutant plan that provides an integrated control strategy to reduce ozone, PM, TACs, and GHGs.

Although the CCAA does not require the region to submit a plan for achieving the State PM_{10} standard, the BAAQMD has prioritized measures to reduce PM in developing the control strategy for the 2010 CAP. The control strategy serves as the backbone of the BAAQMD's current PM control program. The 2010 Plan defined a comprehensive control strategy including 55 control measures to reduce emissions of PM and other air pollutants from a wide variety of emission sources. As these measures are implemented, emissions of primary PM and precursors to the formation of secondary PM would be reduced throughout the Bay Area. As stated above, the USEPA issued a final rule to determine that the Bay Area has attained the 24-hour $PM_{2.5}$ NAAQS, which suspends federal SIP planning requirements for the Bay Area. Despite the USEPA action, the Bay Area will continue to be designated as nonattainment until such time as BAAQMD submits a redesignation request and a maintenance plan to the USEPA and the USEPA approves the redesignation.

The aforementioned air quality plans contain mobile source controls, stationary source controls, and transportation control measures (TCMs) to be implemented in the region to attain the State and federal standards within the SFBAAB. The plans are based on population and employment

projections provided by local governments, usually developed as part of the General Plan update process.

Local Air Quality Monitoring

Air quality is monitored by BAAQMD and CARB at various locations in the region that provide information on ambient concentrations of criteria air pollutants and TACs to help determine which air quality standards are being violated, and to direct the BAAQMD emission reduction efforts, such as developing attainment plans and rules, incentive programs, etc. The proposed project site is located nearest to the Bethel Island Road monitoring site, which is located nearly seven miles northeast of the project site at 5551 Bethel Island Road. Data for $PM_{2.5}$, as well as data for federal 24-hour PM_{10} in 2013, was not available for the Bethel Island Road monitoring site; thus, such data was obtained from the next nearest monitoring site, which is the Concord monitoring site located approximately 14.5 miles west of the project site at 2975 Treat Boulevard. Table 4.2-4 shows historical occurrences of pollutant levels exceeding the State and federal AAQS for the three-year period from 2011 to 2013. The number of days that each standard was exceeded is presented in the tables as well. As shown in the table, the State AAQS and the federal 8-hour AAQS for ozone were exceeded. In addition, the State PM_{10} and State and federal $PM_{2.5}$ AAQS were exceeded. All other State and federal AAQS were met in the area.

Table 4.2-4
Air Quality Data Summary for the Bethel Island Road Air Quality Monitoring Site (2011-2013)

Pollutant	Standard	Days Standard Was Exceeded		
		2011	2012	2013
Ozone	State 1-Hour	0	1	0
	Federal 1-Hour	0	0	0
	State 8-hour	4	4	1
	Federal 8-Hour	2	2	0
PM_{10}	State 24-Hour	0	1	1
	Federal 24-Hour	0	0	0*
$PM_{2.5}$*	State Annual Mean	7.9	6.6	7.6
	Federal 24-Hour	2	0	1
Carbon Monoxide	State/Federal 8-Hour	0	0	0
Nitrogen Dioxide	State 1-Hour	0	0	0
Sulfur Dioxide	State 24-Hour	0	0	0

* Data obtained from the Concord monitoring site.

Source: California Air Resources Board, Aerometric Data Analysis and Management (iADAM) System, http://www.arb.ca.gov/adam/topfour/topfour1.php, accessed January 2015. [11]

Odors

While offensive odors rarely cause physical harm, they can be unpleasant, leading to considerable annoyance and distress among the public and can generate citizen complaints to local governments and air districts. Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources,

quantitative or formulaic methodologies to determine the presence of a significant odor impact do not exist. Adverse effects of odors on residential areas and other sensitive receptors warrant the closest scrutiny; but consideration should also be given to other land use types where people congregate, such as recreational facilities, worksites, and commercial areas. The potential for an odor impact is dependent on a number of variables including the nature of the odor source, distance between a receptor and an odor source, and local meteorological conditions.

One of the most important factors influencing the potential for an odor impact to occur is the distance between the odor source and receptors, also referred to as a buffer zone or setback. The greater the distance between an odor source and receptor, the less concentrated the odor emission would be when reaching the receptor.

Meteorological conditions also affect the dispersion of odor emissions, which determines the exposure concentration of odiferous compounds at receptors. The predominant wind direction in an area influences which receptors are exposed to the odiferous compounds generated by a nearby source. Receptors located upwind from a large odor source may not be affected due to the produced odiferous compounds being dispersed away from the receptors. Wind speed also influences the degree to which odor emissions are dispersed away from any area.

Odiferous compounds can be generated from a variety of source types including both construction and operational activities. A project's operations, depending on the project type, can generate a large range of odiferous compounds that can be considered offensive to receptors. Examples of common land use types that typically generate significant odor impacts include, but are not limited to, the following: wastewater treatment plants; sanitary landfills; composting/green waste facilities; recycling facilities; petroleum refineries; chemical manufacturing plants; painting/coating operations; rendering plants; and food packaging plants. The project site is currently utilized as agricultural land. Existing residences are located to the north, which do not involve any operations that would result in substantial objectionable odors; however, the existing agricultural operations on-site and to the south of the project site could be associated with the generation of objectionable odors.

Although less common, diesel fumes associated with substantial diesel-fueled equipment and heavy-duty trucks, such as from construction activities, freeway traffic, or distribution centers, can be found to be objectionable. Existing nearby sensitive receptors could be subjected to diesel fumes associated with construction of the project. State Route 4 is located approximately 1,700 feet to the east of the project site. Major distribution centers are not located in the vicinity of the project site.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others, due to the types of population groups or activities involved. Heightened sensitivity may be caused by health problems, proximity to the emissions source, and/or duration of exposure to air pollutants. Children, pregnant women, the elderly, and those with existing health problems are especially vulnerable to the effects of air pollution. The BAAQMD defines sensitive receptors as facilities where sensitive receptor population groups (i.e., children, the elderly, the acutely ill, and the

chronically ill) are likely to be located. Accordingly, land uses that are typically considered to be sensitive receptors include residences, schools, playgrounds, childcare centers, retirement homes, convalescent homes, hospitals, and medical clinics.

The proposed project involves the creation of new housing; thus, would introduce new sensitive receptors to the area. Accordingly, the proposed project would be considered a sensitive receptor. The residences to the north would be considered the nearest existing sensitive receptors to the project site. It should be noted that the area to the west of the project site is currently undeveloped, but is approved for residential uses. In addition, the currently undeveloped farm land to the south is planned for future residential uses per the City's General Plan. Similarly, the currently undeveloped land within Brentwood to the east is planned for future residential, mixed use, and commercial development. Accordingly, additional sensitive receptors could eventually be located in the vicinity of the project site.

Greenhouse Gases

Greenhouse gases (GHGs) are gases that absorb and emit radiation within the thermal infrared range, trapping heat in the earth's atmosphere. The increase in atmospheric concentrations of GHG has resulted in more heat being held within the atmosphere, which is the accepted explanation for global climate change. Some GHGs occur naturally and are emitted into the atmosphere through both natural processes and human activities. Other GHGs are created and emitted solely through human activities. The principal GHGs that enter the atmosphere due to human activities are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated carbons. Other common GHGs include water vapor, ozone, and aerosols.

The primary GHG emitted by human activities is CO_2, with the next largest components being CH_4 and N_2O. The primary sources of CH_4 emissions include domestic livestock sources, decomposition of wastes in landfills, releases from natural gas systems, coal mine seepage, and manure management. The main human activities producing N_2O are agricultural soil management, fuel combustion in motor vehicles, nitric acid production, manure management, and stationary fuel combustion. Emissions of GHG by economic sector indicate that energy-related activities account for the majority of U.S. emissions. Electricity generation is the largest single-source of GHG emissions, and transportation is the second largest source, followed by industrial activities. The agricultural, commercial, and residential sectors account for the remainder of GHG emission sources.[12] Emissions of GHG are offset by uptake of carbon and sequestration in forests, trees in urban areas, agricultural soils, and landfilled yard trimmings and food scraps. Attainment concentration standards for GHGs have not been established by the federal or State government.

Global Warming Potential

Global Warming Potential (GWP) is one type of simplified index (based upon radiative properties) that can be used to estimate the potential future impacts of emissions of various gases. According to the USEPA, the global warming potential of a gas, or aerosol, to trap heat in the atmosphere is the "cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas." The reference gas

for comparison is CO_2. GWP is based on a number of factors, including the heat-absorbing ability of each gas relative to that of CO_2, as well as the decay rate of each gas relative to that of CO_2. Each gas's GWP is determined by comparing the radiative forcing associated with emissions of that gas versus the radiative forcing associated with emissions of the same mass of CO_2, for which the GWP is set at one. Methane gas, for example, is estimated by the USEPA to have a comparative global warming potential 21 times greater than that of CO_2, as shown in Table 4.2-5.

Table 4.2-5
Global Warming Potentials and Atmospheric Lifetimes of Select GHGs

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100 year time horizon)
Carbon Dioxide	50-200	1
Methane	12±3	21
Nitrous Oxide	120	310
HFC-23	264	11,700
HFC-134a	14.6	1,300
HFC-152a	1.5	140
PFC: Tetrafluoromethane (CF_4)	50,000	6,500
PFC: Hexafluoroethane (C_2F_6)	10,000	9,200
Sulfur Hexafluoride (SF_6)	3,200	23,900

Source: USEPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 -2011, April 2013.[13]

As shown in the table, at the extreme end of the scale, sulfur hexafluoride is estimated to have a comparative GWP 23,900 times that of CO_2. The "specified time horizon" is related to the atmospheric lifetimes of such GHGs, which are estimated by the USEPA to vary from 50 to 200 years for CO_2, to 50,000 years for tetrafluoromethane. Longer atmospheric lifetimes allow GHG to buildup in the atmosphere; therefore, longer lifetimes correlate with the global warming potential of a gas. The common indicator for GHG is expressed in terms of metric tons of CO_2 equivalents ($MTCO_2e$).

Analysis of GHGs and Global Climate Change

Analysis of global climate change presents the challenge of analyzing the relationship between local and global activities. GHGs are not generally thought of as traditional air pollutants because GHGs, and their impacts, are global in nature, while air pollutants affect the health of people and other living things at ground level, in the general region of their release to the atmosphere. Accordingly, the issue of global climate change is different from any other areas of air quality impact analysis. A global climate change analysis must be conducted on a global level, rather than the typical local or regional setting, and requires consideration of not only emissions from the project under consideration, but also the extent of the displacement, translocation, and redistribution of emissions.

In the usual context, where air quality is linked to a particular location or area, considering the creation of new emissions in that specific area to be an environmental impact whether or not the emissions are truly "new" emissions to the overall globe is appropriate. In fact, the approval of a

new developmental plan or project does not necessarily create new automobile drivers – the primary source of a land use project's emissions. Rather, a new land use project may simply be redistributing existing mobile emissions. For example, future residents of the proposed project could be current residents within the region that would be moving from other parts of the region to the project site, which could result in a shorter or longer associated vehicle trip, but would not introduce a new vehicle trip to the overall region. Accordingly, the use of models that measure overall emissions increases without accounting for existing emissions would substantially overstate the impact of the development project on global warming. Thus, an accurate analysis of GHG emissions substantially differs from other air quality impacts, where the "addition" of redistributed emissions to a new locale can make a substantial difference to overall air quality in that area.

4.2.3 REGULATORY CONTEXT

Air quality and GHGs are monitored through the efforts of various international, federal, State, and local government agencies. The agencies work jointly and individually to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for regulating and improving the air quality within the City of Antioch area are discussed below.

Federal Regulations

The most prominent federal regulation is the CAA, which is implemented and enforced by the USEPA.

CAA and USEPA

The CAA requires the USEPA to set NAAQS and designate areas with air quality not meeting NAAQS as nonattainment. The USEPA is responsible for enforcement of NAAQS for atmospheric pollutants and regulates emission sources that are under the exclusive authority of the federal government including emissions of GHGs. The USEPA's air quality mandates are drawn primarily from the CAA, which was signed into law in 1970. Congress substantially amended the CAA in 1977 and again in 1990. The USEPA has adopted policies consistent with CAA requirements demanding states to prepare SIP that demonstrate attainment and maintenance of the NAAQS.

The USEPA has been directed to develop regulations to address the GHG emissions of cars and trucks. The Mandatory Reporting of Greenhouse Gases Rule requires reporting of GHG emissions from large sources and suppliers in the U.S., and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHG, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to the USEPA. To track the national trend in emissions and removals of GHG since 1990, USEPA develops the official U.S. GHG inventory each year.

On December 7, 2009, USEPA issued findings under Section 202(a) of the CAA concluding that GHGs are pollutants that could endanger public health. Under the so-called Endangerment Finding, USEPA found that the current and projected concentrations of the six key well-mixed GHGs – CO_2, CH_4, N_2O, PFCs, SF_6, and HFCs – in the atmosphere threaten the public health and welfare of current and future generations. These findings do not, by themselves, impose any requirements on industry or other entities.

State Regulations

California has adopted a variety of regulations aimed at reducing air pollution and GHG emissions. The adoption and implementation of the key State legislation described in further detail below demonstrates California's leadership in addressing air quality and global climate change. Only the most prominent and applicable California air quality- and GHG-related legislation are included below; however, an exhaustive list and extensive details of California air quality legislation could be found at the CARB website (www.arb.ca.gov).

CCAA and CARB

The CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the CCAA. The CCAA requires that air quality plans be prepared for areas of the State that have not met the CAAQS for ozone, CO, NO_X, and SO_2. Among other requirements of the CCAA, the plans must include a wide range of implementable control measures, which often include transportation control measures and performance standards. In order to implement the transportation-related provisions of the CCAA, local air pollution control districts have been granted explicit authority to adopt and implement transportation controls. The CARB, California's air quality management agency, regulates and oversees the activities of county air pollution control districts and regional air quality management districts. The CARB regulates local air quality indirectly using State standards and vehicle emission standards, by conducting research activities, and through planning and coordinating activities. In addition, the CARB has primary responsibility in California to develop and implement air pollution control plans designed to achieve and maintain the NAAQS established by the USEPA. Furthermore, the CARB is charged with developing rules and regulations to cap and reduce GHG emissions.

Air Quality and Land Use Handbook

CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (Handbook) addresses the importance of considering health risk issues when siting sensitive land uses, including residential development, in the vicinity of intensive air pollutant emission sources including freeways or high-traffic roads, distribution centers, ports, petroleum refineries, chrome plating operations, dry cleaners, and gasoline dispensing facilities.[14] The CARB Handbook draws upon studies evaluating the health effects of traffic traveling on major interstate highways in metropolitan California centers within Los Angeles (Interstate [I] 405 and I-710), the San Francisco Bay, and San Diego areas. The recommendations identified by CARB, including siting residential uses a minimum distance of 500 feet from freeways or other high-traffic roadways, are consistent with those adopted by the State of California for

location of new schools. Specifically, the CARB Handbook recommends, "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" (CARB 2005).

Importantly, the Introduction section of the CARB Handbook clarifies that the guidelines are strictly advisory, recognizing that: "[l]and use decisions are a local government responsibility. The Air Resources Board Handbook is advisory and these recommendations do not establish regulatory standards of any kind." Also, CARB recognizes that there may be land use objectives as well as meteorological and other site specific conditions that need to be considered by a governmental jurisdiction relative to the general recommended setbacks, specifically stating, "[t]hese recommendations are advisory. Land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues" (CARB 2005).

Senate Bill 656

In 2003, the Legislature passed Senate Bill (SB) 656 to reduce public exposure to PM_{10} and $PM_{2.5}$ above the State CAAQS. The legislation requires the CARB, in consultation with local air pollution control and air quality management districts, to adopt a list of the most readily available, feasible, and cost-effective control measures that could be implemented by air districts to reduce PM_{10} and $PM_{2.5}$ emissions. The CARB list is based on California rules and regulations existing as of January 1, 2004, and was adopted by CARB in November 2004. Categories addressed by SB 656 include measures for reduction of emissions associated with residential wood combustion and outdoor greenwaste burning, fugitive dust sources such as paved and unpaved roads and construction, combustion sources such as boilers, heaters, and charbroiling, solvents and coatings, and product manufacturing. Some of the measures include, but are not limited to, the following:

- Reduce or eliminate wood-burning devices allowed;
- Prohibit residential open burning;
- Permit and provide performance standards for controlled burns;
- Require water or chemical stabilizers/dust suppressants during grading activities;
- Limit visible dust emissions beyond the project boundary during construction;
- Require paving/curbing of roadway shoulder areas; and
- Require street sweeping.

Assembly Bill 32

In September 2006, Assembly Bill (AB) 32, the California Climate Solutions Act of 2006, was enacted (Stats. 2006, ch. 488) (Health & Saf. Code, §38500 et seq.). AB 32 delegated the authority for its implementation to the CARB and directs CARB to enforce the State-wide cap. Among other requirements, AB 32 required CARB to (1) identify the State-wide level of GHG emissions in 1990 to serve as the emissions limit to be achieved by 2020, and (2) develop and implement a Scoping Plan. Accordingly, the CARB has prepared the *Climate Change Scoping Plan* (Scoping Plan) for California, which was approved in 2008.[15] The Scoping Plan provides the outline for actions to reduce California's GHG emissions. Based on the reduction goals

called for in the 2008 Scoping Plan, a 29 percent reduction in GHG levels relative to a Business As Usual (BAU) scenario would be required to meet 1990 levels by 2020. The reduction goal and BAU scenario for the Scoping Plan were based on 2005 emissions projections. A BAU scenario is a baseline condition based on what could or would occur on a particular site in the year 2020 without implementation of a proposed project or any required or voluntary GHG reduction measures, including any State regulation GHG emission reductions. A project's BAU scenario is project- and site-specific, and varies from project to project.

In 2011, the baseline or BAU level for the Scoping Plan was revised based on more recent (2010) data in order to account for the economic downturn and State regulation emission reductions (i.e., Pavley, Low Carbon Fuel Standard [LCFS], and Renewable Portfolio Standard [RPS]).[16] Accordingly, the Scoping Plan emission reduction target from BAU levels required to meet 1990 levels by 2020 was modified from 29 percent to 21.7 percent (where BAU levels do not account for Statewide regulation emission reductions) below the revised estimated BAU level. The amended Scoping Plan was re-approved August 24, 2011.[17]

The Scoping Plan must be updated every five years. CARB approved its Updated Scoping Plan in May 2014. The Update to the Scoping Plan (Scoping Plan Update) was developed by the CARB in collaboration with the State's Climate Action Team and reflects the input and expertise of a range of state and local government agencies. The Update highlights California's success to date in reducing its GHG emissions and lays the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to the target of 80 percent reduction in GHG emissions below 1990 levels by 2050.

The Scoping Plan Update covers a range of topics, including the following:

- An update of the latest scientific findings related to climate change and its impacts, including short-lived climate pollutants.
- A review of progress-to-date, including an update of Scoping Plan measures and other state, federal, and local efforts to reduce GHG emissions in California.
- Potential technologically feasible and cost-effective actions to further reduce GHG emissions by 2020.
- Recommendations for establishing a mid-term emissions limit that aligns with the State's long-term goal of an emissions limit 80 percent below 1990 levels by 2050.
- Sector-specific discussions covering issues, technologies, needs, and ongoing State activities to significantly reduce emissions throughout California's economy through 2050.
- Priorities and recommendations for investment to support market and technology development and necessary infrastructure in key areas.[18]

California GHG Cap-and-Trade Program

The AB 32 Scoping Plan identifies a cap-and-trade program as one of the strategies California will employ to reduce the GHG emissions that cause climate change. The program will help put California on the path to meet the GHG emission reduction goal of 1990 levels by the year 2020,

and ultimately achieving an 80 percent reduction from 1990 levels by 2050. Under cap-and-trade, an overall limit on GHG emissions from capped sectors would be established by the cap-and-trade program and facilities subject to the cap would be able to trade permits (allowances) to emit GHGs. The CARB has designed a California cap-and-trade program that is enforceable and meets the requirements of AB 32. The program started on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions.

AB 1493

California AB 1493 (Stats. 2002, ch. 200) (Health & Safety Code, §§42823, 43018.5), known as Pavley I, was enacted on July 22, 2002. AB 1493 requires that the CARB develop and adopt regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty truck and other vehicles determined by the CARB to be vehicles whose primary use is noncommercial personal transportation in the state." On June 30, 2009, the USEPA granted a waiver of CAA preemption to California for the State's GHG emission standards for motor vehicles, beginning with the 2009 model year. Pursuant to the CAA, the waiver allows for the State to have special authority to enact stricter air pollution standards for motor vehicles than the federal government's. On September 24, 2009, the CARB adopted amendments to the Pavley regulations (Pavley I) that reduce GHG emissions in new passenger vehicles from 2009 through 2016. The second phase of the Pavley regulations (Pavley II) is expected to affect model year vehicles from 2016 through 2020. The CARB estimates that the regulation would reduce GHG emissions from the light-duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030.

Executive Order S-01-07

On January 18, 2007, then-Governor Schwarzenegger signed Executive Order S-01-07, which mandates that a State-wide goal be established to reduce carbon intensity of California's transportation fuels by at least 10 percent by 2020. The Order also requires that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established for California.

Executive Order S-03-05

On June 1, 2005, then-Governor Schwarzenegger signed Executive Order S-03-05, which established total GHG emission targets. Specifically, emissions are to be reduced to year 2000 levels by 2010, 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. The Executive Order directed the Secretary of the California Environmental Protection Agency (Cal-EPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The Secretary is also directed to submit biannual reports to the governor and state legislature describing: (1) progress made toward reaching the emission targets; (2) impacts of global warming on California's resources; and (3) mitigation and adaptation plans to combat these impacts.

To comply with the Executive Order, the Secretary of the Cal-EPA created a Climate Act Team (CAT) made up of members from various State agencies and commissions. In March 2006, CAT

released their first report. In addition, the CAT has released several "white papers" addressing issues pertaining to the potential impacts of climate change on California.

Executive Order S-13-08

Then-Governor Arnold Schwarzenegger issued Executive Order S-13-08 on November 14, 2008. The Executive Order is intended to hasten California's response to the impacts of global climate change, particularly sea level rise, and directs state agencies to take specified actions to assess and plan for such impacts, including requesting the National Academy of Sciences to prepare a Sea Level Rise Assessment Report, directing the Business, Transportation, and Housing Agency to assess the vulnerability of the State's transportation systems to sea level rise, and requiring the Office of Planning and Research and the Natural Resources Agency to provide land use planning guidance related to sea level rise and other climate change impacts.

The order also required State agencies to develop adaptation strategies to respond to the impacts of global climate change that are predicted to occur over the next 50 to 100 years. The adaption strategies report summarizes key climate change impacts to the State for the following areas: public health; ocean and coastal resources; water supply and flood protection; agriculture; forestry; biodiversity and habitat; and transportation and energy infrastructure. The report recommends strategies and specific responsibilities related to water supply, planning and land use, public health, fire protection, and energy conservation.

Executive Order B-30-15

On April 29, 2015, Executive Order B-30-15 set a statewide GHG reduction target of 40 percent below 1990 levels by 2030. The governor identified the following methods to achieve these reductions:

- Incorporate climate change impacts into the state's Five-Year Infrastructure Plan;
- Update the Safeguarding California Plan – the state climate adaption strategy – to identify how climate change will affect California infrastructure and industry and what actions the state can take to reduce the risks posed by climate change;
- Factor climate change into state agencies' planning and investment decisions; and
- Implement measures under existing agency and departmental authority to reduce greenhouse gas emissions.

The CARB is to update the Climate Change Scoping Plan with the 2030 target and the California Natural Resources Agency is to update Safeguarding California. In addition, all state agencies are to consider climate change and the goals of EO B-30-15 in their planning and investment decisions.

CARB has published a fact sheet summarizing five key goals that Governor Brown has identified for reducing greenhouse gas emissions in California through 2030:

- Increase renewable electricity to 50 percent,
- Double energy efficiency savings achieved in existing buildings and make heating fuels cleaner.
- Reduce petroleum use in cars and trucks by up to 50 percent,
- Reduce emissions of short-lived climate pollutants, and
- Manage farms, rangelands, forests and wetlands to increasingly store carbon.[19]

AB 2588

The Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588), California Health and Safety Code Section 44300 et seq., provides for the regulation of over 200 TACs, including DPM, and is the primary air contaminant legislation in California. Under the act, local air districts may request that a facility account for its TAC emissions. Local air districts then prioritize facilities on the basis of emissions, and high priority designated facilities are required to submit a health risk assessment and communicate the results to the affected public.

AB 1807

AB 1807, enacted in September 1983, sets forth a procedure for the identification and control of TACs in California. CARB is responsible for the identification and control of TACs, except pesticide use, which is regulated by the California Department of Pesticide Regulation.

Renewable Portfolio Standard (RPS)

Established in 2002 under SB 1078, accelerated in 2006 under SB 107, and expanded in 2011 under SB 2, California's Renewables Portfolio Standard (RPS) is one of the most ambitious renewable energy standards in the country. The RPS program requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020.

SB 375

In September 2008, SB 375, known as the Sustainable Communities and Climate Protection Act of 2008, was enacted, which is intended to build on AB 32 by attempting to control GHG emissions from cars and light-duty trucks by curbing sprawl. SB 375 enhances CARB's ability to reach goals set by AB 32 by directing CARB to develop regional GHG emission reduction targets to be achieved by the State's 18 metropolitan planning organizations (MPOs), including the Association of Bay Area Governments (ABAG). Under SB 375, MPOs must align regional transportation, housing, and land-use plans and prepare a "Sustainable Communities Strategy" (SCS) to reduce the amount of vehicle miles traveled in their respective regions and demonstrate the region's ability to attain its greenhouse gas reduction targets. SB 375 provides incentives for creating walkable and sustainable communities and revitalizing existing communities, and allows home builders to get relief from certain environmental reviews under CEQA if they build

projects consistent with the new sustainable community strategies. Furthermore, SB 375 encourages the development of alternative transportation options, which will reduce traffic congestion.

California Building Standards Code

California's building codes (California Code of Regulations [CCR], Title 24) are published on a triennial basis, and contain standards that regulate the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or rehabilitation of a building or other improvement to real property. The California Building Standards Commission (CBSC) is responsible for the administration and implementation of each code cycle, which includes the proposal, review, and adoption process. Supplements and errata are issued throughout the cycle to make necessary mid-term corrections. The 2013 code has been prepared and became effective January 1, 2014, with minor exceptions to Part 6, Part 1, and energy provisions of Part 11, which did not become effective until July 1, 2014. The California building code standards apply State-wide; however, a local jurisdiction may amend a building code standard if the jurisdiction makes a finding that the amendment is reasonably necessary due to local climatic, geological, or topographical conditions.

California Green Building Standards Code

The 2013 California Green Building Standards Code, otherwise known as the CALGreen Code (CCR Title 24, Part 11), became effective January 1, 2014. As mentioned above, the energy provisions of the CALGreen Code did not become effective until July 1, 2014. The purpose of the CALGreen Code is to improve public health, safety, and 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. The provisions of the code apply to the planning, design, operation, construction, use, and occupancy of every newly constructed building or structure throughout California.

The key features of the CALGreen Code include the following mandates:

- Compliance with the California Building Energy Efficiency Standards Code;
- 20 percent mandatory reduction in indoor water use, with voluntary goal standards for 30, 35 and 40 percent reductions;
- Separate indoor and outdoor water meters to measure nonresidential buildings' indoor and outdoor water use with a requirement for moisture-sensing irrigation systems for larger landscape projects;
- Diversion of 50 percent of construction waste from landfills, increasing voluntarily to 65 and 75 percent for new homes and 80 percent for commercial projects;
- Mandatory periodic inspections of energy systems (i.e., heat furnace, air conditioner, mechanical equipment) for nonresidential buildings over 10,000 square feet to ensure that all are working at their maximum capacity according to their design efficiencies; and
- Mandatory use of low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring, and particle board.

In addition to the mandatory measures listed above and to other State-wide mandates, the CALGreen Code encourages local governments to adopt more stringent voluntary provisions, known as Tier 1 and Tier 2 provisions, to further reduce emissions, improve energy efficiency, and conserve natural resources. If a local government adopts one of the tiers, the provisions become mandates for all new construction within that jurisdiction. The City of Antioch has not adopted any voluntary provisions of the CALGreen Code to date.

SB 97

SB 97, signed in August 2007, acknowledges that climate change is an important environmental issue that requires analysis under CEQA. The bill directs the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, by July 1, 2009.

As directed by SB 97, the Governor's Office of Planning and Research (OPR) amended the CEQA Guidelines, effective March 18, 2010, to provide guidance to public agencies regarding the analysis and mitigation of GHG emissions and the effects of GHG emissions in draft CEQA documents. The amendments include revisions to the *Appendix G Initial Study Checklist* that incorporates a new subdivision to address project-generated GHG emissions and contribution to climate change. The new subdivision emphasizes that the effects of GHG emissions are cumulative, and should be analyzed in the context of CEQA's requirements for cumulative impacts analysis. In addition, the revisions include a new subdivision to assist lead agencies in determining the significance of project related GHG emissions. Under the revised CEQA Appendix G checklist, an agency would consider whether the project will generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, and whether the project conflicts with an applicable plan, policy or regulation adopted for the purpose of reducing the emission of GHGs.

Guidance on determining the significance of impacts from GHG emissions is also provided in the SB 97 amendments. The guidance suggests the lead agency make a good-faith effort, based on available information, to describe, calculate or estimate the amount of GHG emissions resulting from a project. When assessing the significance of impacts from GHG emissions on the environment, lead agencies can consider the extent to which the project may increase or reduce GHG as compared to the existing environmental setting, whether the project emissions exceed a threshold of significance determined applicable to the project, and/or the extent to which the project complies with adopted regulations or requirements to implement a State-wide, regional, or local plan for the reduction or mitigation of GHG emissions. When adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.

Under the SB 97 amendments, if GHG emissions of a project are determined to be significant, feasible means of mitigating GHG emissions, such as the following, shall be applied:

- Measurement of the reduction of emissions required as part of the lead agency's decision;
- Reductions in emissions resulting from project through project features, design, or other measures;
- Off-site measures, including offsets, to mitigate a project's emissions;
- Measures that sequester GHG gases; and
- If a GHG reduction plan, ordinance, regulation, or other similar plan is adopted, mitigation may include project-by-project measures, or specific measures or policies found in the plan that reduces the cumulative effect of emissions.

Local Regulations

The following are the regulatory agencies and regulations pertinent to the proposed project on a local level.

Plan Bay Area

Plan Bay area is a long-range integrated transportation and land use/housing strategy through 2040 for the San Francisco Bay Area, designed to reduce greenhouse gas emissions from cars and light duty trucks. On July 18, 2013, the Plan was jointly approved by the Metropolitan Transportation Commission and the Association of Bay Area Governments. Pursuant to SB 375, the Plan includes the region's Sustainable Communities Strategy and 2040 Regional Transportation Plan. Plan Bay Area provides a strategy for meeting 80 percent of the region's future housing needs in Priority Development Areas (PDAs).[20]

Plan Bay Area is based on Visions for Priority Development Areas (PDAs).[21] The Visions report states that from 2010 to 2040, Contra Costa County is projected to experience 12% of the total regional housing growth, or an estimated 93,390 additional households. The County will also take 11 percent of the region's job growth, or 70,300 new jobs, the majority of which will be in PDAs. Both job and housing growth will cluster along San Pablo Avenue in the western part of the County, including Richmond, as well as in the suburbs of Antioch, Pittsburgh, Walnut Creek, and San Ramon. The most transformative growth will occur at the former Concord Naval Weapons station, where a new Regional Center with over 17,000 jobs and 12,000 homes will rise near BART. Within the City of Antioch, the Plan identifies the area near the Hillcrest BART station and the Rivertown Waterfront area as PDAs.

The Introduction to the Plan explains: "Adoption of Plan Bay Area does not mandate any changes to local zoning, general plans or project review. The region's cities, towns and counties maintain control of all decisions to adopt plans and permit or deny development projects. Similarly, Plan Bay Area's forecasted job and housing numbers do not act as a direct or indirect cap on development locations in the region. The forecasts are required by SB 375 and reflect the intent of regional and local collaboration that is the foundation of Plan Bay Area".[22]

The plan assists jurisdictions seeking to implement the plan at the local level by providing funding for PDA planning and transportation projects. Plan Bay Area also provides jurisdictions with the option of increasing the efficiency of the development process for projects consistent with the plan and other criteria included in SB 375.

Bay Area Air Quality Management District

The BAAQMD is the public agency entrusted with regulating stationary sources of air pollution in the nine counties that surround San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties. The BAAQMD has prepared their own *CEQA Air Quality Guidelines* (May 2011), which is intended to be utilized for assistance with CEQA review. BAAQMD adopted updated CEQA Air Quality Guidelines, including new thresholds of significance, in June 2010, and revised them in May 2011. The Air Quality Guidelines advise lead agencies on how to evaluate potential air quality impacts, including establishing quantitative and qualitative thresholds of significance.

The BAAQMD resolutions adopting and revising the significance thresholds in 2011 were set aside by the Alameda County Superior Court on March 5, 2012. The Alameda Superior Court did not determine whether the thresholds were valid on the merits, but found that the adoption of the thresholds was a project under CEQA, necessitating environmental review. The BAAQMD appealed the Alameda County Superior Court's decision. The Court of Appeal of the State of California, First Appellate District, reversed the trial court's decision. The Court of Appeal's decision was appealed to the California Supreme Court, which granted limited review, and the matter is currently pending there. The California Supreme Court has indicated that it will address the question whether CEQA review is confined to an analysis of a proposed project's impacts on the existing environment, or does it also require analysis of the existing environment's impacts on the proposed project. The California Supreme Court has not indicated that it will review the underlying question whether adoption of the thresholds is a project under CEQA, and no court has indicated that the thresholds lack evidentiary support. In May of 2012, BAAQMD updated its CEQA Air Quality Guidelines to continue to provide direction on recommended analysis methodologies, but without recommended quantitative significance thresholds. The May 2012 BAAQMD CEQA Air Quality Guidelines state that Lead agencies may reference the Air District's 1999 Thresholds of Significance available on the Air District's website. Lead agencies may also reference the Air District's CEQA Thresholds Options and Justification Report developed by staff in 2009. The CEQA Thresholds Options and Justification Report, available on the District's website, outlines substantial evidence supporting a variety of thresholds of significance.

Regional Air Quality Plans

As discussed above, the 2001 Ozone Attainment Plan was prepared as a revision to the Bay Area part of the SIP to achieve the federal ozone standard. The plan was adopted on October 24, 2001, approved by the CARB on November 1, 2001, and was submitted to the USEPA on November 30, 2001 for review and approval as a revision to the SIP. In addition, in order to fulfill federal air quality planning requirements, the BAAQMD adopted a $PM_{2.5}$ emissions inventory for the year 2010, which was submitted to the USEPA on January 14, 2013 for inclusion in the SIP.

The most recent State ozone plan is the 2010 Clean Air Plan (CAP), adopted on September 15, 2010. The 2010 CAP was developed as a multi-pollutant plan that provides an integrated control strategy to reduce ozone, PM, TACs, and GHGs. Although the CCAA does not require the region to submit a plan for achieving the State PM_{10} standard, the BAAQMD has prioritized measures to reduce PM in developing the control strategy for the 2010 CAP. It should be noted that on January 9, 2013, the USEPA issued a final rule to determine that the San Francisco Bay Area has attained the 24-hour $PM_{2.5}$ federal standard, which suspends federal SIP planning requirements for the Bay Area.

The aforementioned applicable air quality plans contain mobile source controls, stationary source controls, and TCMs to be implemented in the region to attain the State and federal standards within the SFBAAB. The plans are based on population and employment projections provided by local governments, usually developed as part of the General Plan update process.

Rules and Regulations

All projects under the jurisdiction of the BAAQMD are required to comply with all applicable BAAQMD rules and regulations. BAAQMD's regulations and rules include, but are not limited to, the following:

- Regulation 6: Particulate Matter and Visible Emissions
  - Rule 3: Wood-burning Devices
- Regulation 7: Odorous Substances
- Regulation 8: Organic Compounds
  - Rule 3: Architectural Coatings

<u>City of Antioch General Plan</u>

The following are applicable General Plan goals and policies related to air quality and GHG from the City of Antioch General Plan:

Objective 10.6.1 Minimize air pollutant emissions within the Antioch Planning Area so as to assist in achieving state and federal air quality standards.

Construction Emissions

Policy 10.6.2.a Require development projects to minimize the generation of particulate emissions during construction through implementation of the dust abatement actions outlined in the CEQA Handbook of the Bay Area Air Quality Management District.

Mobile Emissions

Policy 10.6.2.b Require developers of large residential and non-residential projects to participate in programs and to take measures to improve traffic flow and/or reduce vehicle trips resulting in decreased vehicular emissions. Examples of such efforts may include, but are not limited to the following:

- Development of mixed use projects, facilitating pedestrian and bicycle transportation and permitting consolidation of vehicular trips.
- Installation of transit improvements and amenities, including dedicated bus turnouts and sufficient rights-of-way for transit movement, bus shelters, and pedestrian easy access to transit.
- Provision of bicycle and pedestrian facilities, including bicycle lanes and pedestrian walkways connecting residential areas with neighborhood commercial centers, recreational facilities, schools, and other public areas.
- Contributions for off-site mitigation for transit use.
- Provision of charging stations for electric vehicles within large employment-generating and retail developments.

Stationary Source Emissions

Policy 10.6.2.f Provide physical separations between (1) proposed new industries having the potential for emitting toxic air contaminants and (2) existing and proposed sensitive receptors (e.g ., residential areas, schools, and hospitals).

Policy 10.6.2.g Require new wood burning stoves and fireplaces to comply with EPA and BAAQMD approved standards.

4.2.4 IMPACTS AND MITIGATION MEASURES

The standards of significance and methodology utilized to analyze and determine the proposed project's potential project-specific and cumulative impacts are described below. The standards are based on policies of the City of Antioch and other responsible agencies. In addition, a discussion of the project's impacts, as well as mitigation measures where necessary, is also presented.

Standards of Significance

The air quality analysis in this EIR uses the previously-adopted 2011 thresholds of the BAAQMD to determine the potential impacts of the project. These thresholds are based on substantial evidence identified in BAAQMD's 2009 Justification Report; this report was independently reviewed by the City of Antioch, which considers the thresholds developed by the BAAQMD in 2009 to be supported by substantial evidence. Accordingly, these thresholds are used by the City as its own independently adopted thresholds for CEQA analysis, including within the EIR.

The BAAQMD 2011 Guidelines established significance thresholds for emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with proposed development projects, as presented in Table 4.2-6. The significance thresholds are expressed in pounds per day (lbs/day) for construction and operational emissions, and tons per year for cumulative emissions.

BAAQMD's approach to developing a Threshold of Significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions needed to move us towards climate stabilization. If a project would generate GHG emissions above the threshold level, it would be considered to contribute substantially to a cumulative impact, and would be considered significant. The threshold used in this EIR is:

- annual emissions less than 1,100 metric tons per year (MT/yr) of CO2e; or
- annual emissions less than 4.6 MT CO2e/service population/ year. Service population is defined to mean residents and employees.

Table 4.2-6
BAAQMD Thresholds of Significance

Pollutant	Construction (lbs/day)	Operational (lbs/day)	Cumulative (tons/year)
ROG	54	54	10
NO_X	54	54	10
PM_{10}	82	82	15
$PM_{2.5}$	54	54	10

Source: BAAQMD, CEQA Guidelines, May 2011.

According to the BAAQMD 2011 CEQA Guidelines, a significant impact related to TAC would occur if a project would result in any of the following:

- An increase in cancer risk levels of more than 10 in one million, or a non-cancer (chronic or acute) hazard index greater than 1.0; or
- An incremental increase in cancer risk levels of more than 0.3 micrograms per cubic meter ($\mu g/m^3$) annual average $PM_{2.5}$.

A cumulatively considerable impact associated with TACs would occur if the aggregate total of all past, present, and foreseeable future sources within an 1,000-foot radius of the fence line of a

source or from the location of a receptor, plus the contribution from the project, would exceed the following:

- An increase in cancer risk levels of more than 100 in one million or a chronic non-cancer hazard index (from all sources) greater than 10.0; or
- An incremental increase in cancer risk levels of more than 0.8 µg/m^3 annual average $PM_{2.5}$.

The BAAQMD 2011 threshold associated with localized CO emissions is 20.0 parts per million (ppm) for a 1-hour averaging time and 9.0 ppm for an 8-hour averaging time. In order to provide a conservative indication of whether a project would result in localized CO emissions that would exceed the applicable threshold of significance, the BAAQMD has established screening criteria for localized CO emissions. According to BAAQMD, a proposed project would result in a less-than-significant impact related to localized CO emission concentrations if the following screening criteria are met:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans;
- The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; and
- The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, underpass, etc.).

Based on the technical studies prepared by BAAQMD as presented above and consistent with Appendix G of the CEQA Guidelines, a significant impact associated with air quality and/or GHG emissions would occur if the proposed project would result in any of the following:

- Generation of short-term construction-related criteria air pollutant emissions in excess of 54 lbs/day for ROG, NO_X, and $PM_{2.5}$ and 82 lbs/day for PM_{10});
- Generation of long-term operational criteria air pollutant emissions in excess of 54 lbs/day for ROG, NO_X, and $PM_{2.5}$ and 82 lbs/day for PM_{10});
- Conflict with or obstruct implementation of regional air quality plans;
- Exposure of sensitive receptors or the general public to substantial levels of pollutant concentrations (i.e., localized CO emissions of 20.0 ppm for 1-hour averaging time or 9.0 ppm for 8-hour averaging time; increase in cancer risk levels of more than 10 in one million or a non-cancer hazard index greater than 1.0; incremental increase in cancer risk levels of more than 0.3 µg/m^3 annual average $PM_{2.5}$; cumulative increase in cancer risk of more than 100 in one million or cumulative non-cancer hazard index greater than 10.0; and cumulative incremental increase in cancer risk levels of more than 0.8 µg/m^3 annual average $PM_{2.5}$);
- Creation of objectionable odors affecting a substantial number of people;
- Generation of a cumulatively considerable contribution to regional criteria air pollutant emissions in excess of 10 tons/year for ROG, NO_X, and $PM_{2.5}$ and 15

tons/year for PM_{10}); and

- Generation of a cumulatively considerable contribution to GHG emissions in excess of 1,100 $MTCO_2e$ per year or 4.6 $MTCO_2e$ per service population per year).

Method of Analysis

A comparison of the proposed project's emissions to the thresholds discussed above was used to determine the significance of the proposed project's potential impacts to air quality and climate change. Emissions attributable to the proposed project which exceed the significance thresholds could have a significant effect on regional air quality and the attainment of the federal and State AAQS. The analysis protocol and guidance provided by the BAAQMD CEQA Guidelines was utilized to analyze the proposed project's air quality and climate change impacts, including screening criteria. Where potentially significant air quality impacts are identified, mitigation measures are described that would reduce or eliminate the impact.

The proposed project's short-term construction, long-term operational, and GHG emissions were estimated using the California Emissions Estimator Model (CalEEMod) version 2013.2.2 software - a statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify air quality emissions, including GHG emissions, from land use projects. The model applies inherent default values for various land uses, including trip generation rates based on the ITE Manual, vehicle mix, trip length, average speed, etc. However, where project-specific data was available, such data was input into the model (e.g., construction phases and timing and vehicle trip rate). The results of emissions estimations were compared to the standards of significance discussed above in order to determine the associated level of impact. All CalEEMod modeling results are included in Appendix C to this EIR.

Project-Specific Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in comparison with the standards of significance identified above.

4.2-1 Generation of short-term construction-related criteria air pollutant emissions. Based on the analysis below and with the implementation of mitigation, the impact would be *less than significant.*

Construction of the proposed project is anticipated to commence in April 2017 and would likely be carried out in phases. However, in order to provide a conservative analysis, construction of the site was assumed to occur over one phase, where all residences are constructed at once. During construction of the project, various types of equipment and vehicles would temporarily operate on the project site. Construction exhaust emissions would be generated from construction equipment, vegetation clearing and earth movement activities, construction workers' commute, and construction material hauling for the entire construction period. The aforementioned activities would involve the use of diesel- and gasoline-powered equipment that would generate emissions of criteria pollutants. Project construction activities also represent sources of fugitive dust, which

includes PM_{10} and $PM_{2.5}$ emissions. As construction of the proposed project would generate air pollutant emissions intermittently within the site, and in the vicinity of the site, until all construction has been completed, construction is a potential concern because the proposed project is in a nonattainment area for ozone and PM.

The proposed project is required to comply with all BAAQMD rules and regulations including Regulation 8, Rule 3 related to architectural coatings.

Utilizing CalEEMod, the proposed project's maximum construction-related emissions were estimated and are presented in Table 4.2-7. As presented in the table below, the proposed project would result in construction-related emissions of ROG, $PM_{10,}$ and $PM_{2.5}$ below the applicable thresholds of significance. However, emissions of NO_X would exceed the applicable threshold of significance. Therefore, the proposed project could contribute to the region's nonattainment status of ozone and violate an air quality standard, and a ***potentially significant*** impact associated with construction-related emissions of NO_X would result.

Table 4.2-7
Maximum Unmitigated Project Construction-Related Emissions (lbs/day)

	ROG	**NO_X**	**PM_{10}**	**$PM_{2.5}$**
Proposed Project	14.22	69.70	20.99	12.51
BAAQMD Thresholds	54	54	82	54
Exceed Thresholds?	**NO**	**YES**	**NO**	**NO**

Source: CalEEMod, January 2015 (see Appendix C).

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the construction-related emissions of NO_X to below the applicable threshold of significance, as presented in Table 4.2-8. Thus, implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

Table 4.2-8
Maximum Mitigated Project Construction-Related Emissions (lbs/day)

	ROG	**NO_X**	**PM_{10}**	**$PM_{2.5}$**
Proposed Project	13.85	50.11	19.63	11.29
BAAQMD Thresholds	54	54	82	54
Exceed Thresholds?	**NO**	**NO**	**NO**	**NO**

Source: CalEEMod, January 2015 (see Appendix C).

4.2-1 *Prior to issuance of a grading permit, the project applicant shall show on the grading plans via notation that the contractor shall ensure:*

- *All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.*

- *All haul trucks transporting soil, sand, or other loose material off-site shall be covered.*
- *All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.*
- *All vehicle speeds on unpaved roads shall be limited to 15 mph.*
- *All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.*
- *Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.*
- *All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.*
- *Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.*
- *All diesel-powered equipment larger than 200 horsepower (i.e., rubber tired dozers, scrapers, and cranes) and diesel-powered graders shall meet USEPA emissions standards for Tier 2 engines or equivalent.*

The grading plans shall be submitted for review and approval by the City Engineer.

4.2-2 Generation of long-term operational criteria air pollutant emissions and a conflict with or obstruction of implementation of regional air quality plans. Based on the analysis below, the impact is *less than significant.*

Operational emissions of ROG, NO_X, CO, and PM_{10} would be generated by the proposed project from both mobile and stationary sources. Day-to-day activities such as future resident vehicle trips to and from the project site would make up the majority of the mobile emissions. Emissions would occur from area sources such as natural gas combustion from heating mechanisms, landscape maintenance equipment exhaust, and consumer products (e.g., deodorants, cleaning products, spray paint, etc.).

As stated above, the project is required to comply with all BAAQMD rules and regulations including Regulations 6, Rule 3, associated with wood-burning devices, which restricts wood-burning devices in new building construction, and Regulation 8,

Rule 3 related to architectural coatings, which requires use of low volatile organic compound (VOC) paints.

The proposed project's daily unmitigated operational emissions have been estimated using CalEEMod and are presented in Table 4.2-9. It should be noted that the proposed project's anticipated vehicle trips were applied to the modeling based on the Transportation Impact Assessment prepared for the proposed project by Fehr & Peers. In addition, compliance with the applicable BAAQMD rules and regulations as noted above have been included in the modeling such as use of only low VOC paints.

As shown in the table, the proposed project would result in operational emissions of ROG, NO_X, $PM_{10,}$ and $PM_{2.5}$ below the applicable thresholds of significance. Therefore, the proposed project would not contribute to the region's nonattainment status of ozone and PM or violate air quality standards.

Table 4.2-9
Unmitigated Maximum Project Operational Emissions (lbs/day)

	ROG	**NO_X**	**PM_{10}**	**$PM_{2.5}$**
Proposed Project	45.70	30.99	30.95	9.77
BAAQMD Thresholds	54	54	82	54
Exceed Thresholds?	**NO**	**NO**	**NO**	**NO**

Source: CalEEMod, January 2015 (see Appendix C).

As stated previously, the applicable regional air quality plans include the 2001 Ozone Attainment Plan and the 2010 CAP. The air quality plans contain mobile source controls, stationary source controls, and TCMs to be implemented within the region to attain the State and federal ozone standards within the SFBAAB. According to the BAAQMD CEQA Guidelines, if a project would not result in significant and unavoidable air quality impacts, after the application of all feasible mitigation, the project may be considered consistent with the air quality plans. Because the proposed project would result in emissions below the applicable thresholds of significance, the project would not be considered to conflict with or obstruct implementation of regional air quality plans.

The proposed project would not contribute to the region's nonattainment status of ozone, violate an air quality standard, or conflict with or obstruct implementation of regional air quality plans; therefore, the impact associated with operational emissions would be ***less than significant***.

Mitigation Measure(s)
None required.

4.2-3 Exposure of sensitive receptors or the general public to substantial levels of pollutant concentrations. Based on the analysis below, the impact is *less than significant.*

The major pollutant concentrations of concern are localized CO emissions and TAC emissions, which are addressed in further detail below.

Localized CO Emissions

Localized concentrations of CO are related to the levels of traffic and congestion along streets and at intersections. Implementation of the proposed project would increase traffic volumes on streets near the project site; therefore, the project would be expected to increase local CO concentrations. High levels of localized CO concentrations are only expected where background levels are high, and traffic volumes and congestion levels are high. The statewide CO Protocol document[19] identifies signalized intersections operating at Level of Service (LOS) E or F, or projects that would result in the worsening of signalized intersections to LOS E or F, as having the potential to result in localized CO concentrations in excess of the State or federal AAQS, as a result of large numbers of cars idling at stop lights.

In accordance with the State CO Protocol, the BAAQMD has established preliminary screening criteria for determining whether the effect that a project would have on any given intersection would cause a potential CO hotspot. If the following criteria are met by the proposed project at all affected intersections, the proposed project would not be expected to result in a CO hotspot:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans;
- The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; and
- The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, underpass, etc.).

The East County Action Plan includes several adopted traffic management plans and programs for selected arterials in East Contra Costa County. The proposed project's traffic-related impacts in comparison with such plans and other regulations are discussed in further detail in Chapter 4.11, Transportation and Circulation of this EIR. Where the project would increase delay under existing or cumulative conditions in excess of the criteria specified in the East County Action Plan, appropriate mitigation measures are applied to ensure such impacts are reduced to less-than-significant levels. Thus, the project would not conflict with or obstruct implementation of any applicable congestion management program. Thus, overall, the proposed project would be considered to be consistent with applicable congestion management programs or transportation plans.

Based on data provided in the Transportation Impact Assessment prepared for the proposed project, the maximum traffic volume anticipated at an affected intersection would not reach 44,000 vehicles per hour. In addition, the project would not increase traffic volumes at any intersections where vertical and/or horizontal mixing is substantially limited. Therefore, the proposed project would not be expected to result in substantial levels of localized CO at surrounding intersections or generate localized concentrations of CO that would exceed standards.

TAC Emissions

Another category of environmental concern is TACs. Typically, the sources of TACs of concern are any sources located within 1,000 feet of a sensitive receptor or proposed project site. The CARB has identified DPM from diesel-fueled engines as a TAC; thus, high volume freeways, stationary diesel engines, such as construction equipment, and facilities attracting heavy and constant diesel vehicle traffic are identified as having the highest associated health risks from DPM. The proposed project site is not in the vicinity of any high volume freeway or other facilities attracting heavy or constant diesel vehicle traffic, and is not near any existing stationary sources of TACs. As such, new on-site sensitive receptors would not be exposed to substantial TAC emissions associated with such uses. In addition, the proposed project, being a residential development, would not involve long-term operation of any stationary diesel engine or other major on-site stationary source of TACs. Thus, the proposed project would not expose any existing sensitive receptors to substantial TAC emissions.

It should be noted that construction-related activities could result in the generation of TACs, specifically DPM, from on-road haul trucks and off-road equipment exhaust emissions. However, construction is temporary and occurs over a relatively short duration in comparison to the operational lifetime of the proposed project. Methodologies for conducting health risk assessments are associated with long-term exposure periods (e.g., over a 70-year lifetime). Buildout of the proposed project would likely occur in phases, where only portions of the site would be disturbed at a time, with operation of construction equipment regulated by federal, State, and local standards, including BAAQMD rules and regulations, and occurring intermittently throughout the course of a day. The construction equipment staging areas would be located away from the nearest sensitive receptors, which would be the residences located along the northern border of the site. In addition, winds move from west to east in the region, which would help to move any potential pollutants away from the residences to the north. Considering the short amount of time and intermittent nature of construction equipment operating within an influential distance to the nearest sensitive receptors, the likelihood that any one sensitive receptor would be exposed to high concentrations of DPM for any extended period of time would be low. For the aforementioned reasons, project construction would not be expected to expose sensitive receptors to substantial pollutant concentrations.

Conclusion

The proposed project would not be expected to result in localized CO concentrations that would exceed standards and would not expose sensitive receptors to such. In addition, future sensitive receptors on-site would not be exposed to substantial levels of pollutant concentrations associated with existing or future sources. Furthermore, construction or operation of the proposed project would not be expected to expose existing or future sensitive receptors to substantial emissions associated with stationary diesel engines or other major on-site stationary source of TACs. Therefore, the proposed project would result in a ***less-than-significant*** impact associated with exposure of sensitive receptors to substantial levels of pollutant concentrations.

Mitigation Measure(s)
None required.

4.2-4 Creation of objectionable odors affecting a substantial number of people. Based on the analysis below, the impact is *less than significant.*

As discussed above, due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, quantitative methodologies to determine the presence of a significant odor impact do not exist. Typical odor-generating land uses include, but are not limited to, wastewater treatment plants, landfills, and composting facilities. The proposed project would not introduce any such land uses and is not located in the vicinity of any existing or planned such land uses.

Residential land uses are not typically associated with the creation of substantial objectionable odors. However, existing agricultural land uses are located to the south of the project site. Accordingly, the future residents of the proposed project could potentially be exposed to odors associated with the ongoing agricultural operations. The site would be separated from the existing agricultural areas by Sand Creek and the associated setback from the creek, which would provide a buffer between the proposed project and the ongoing agricultural operations to the south. Thus, the nearby agricultural operations would not be expected to create objectionable odors that would affect a substantial number of people on the project site.

Diesel fumes from construction equipment are often found to be objectionable; however, construction is temporary and operation of equipment is regulated by federal, State, and local standards, including BAAQMD rules and regulations. The proposed project would be required to comply with all applicable BAAQMD rules and regulations, which would help to control construction-related odorous emissions. Therefore, construction of the proposed project would not be expected to create objectionable odors affecting a substantial number of people.

It should be noted that BAAQMD regulates objectionable odors through Regulation 7, Odorous Substances, which does not become applicable until the Air Pollution Control

Officer (APCO) receives odor complaints from ten or more complainants within a 90-day period. Once effective, Regulation 7 places general limitation on odorous substances and specific emission limitations on certain odorous compounds, which remain effective until such time that citizen complaints have been received by the APCO for one year. The limits of Regulation 7 become applicable again when the APCO receives odor complaints from five or more complainants within a 90-day period. Thus, although not anticipated, if odor complaints are made after the proposed project is developed, the BAAQMD would ensure that such odors are addressed and any potential odor effects reduced to less than significant.

For the aforementioned reasons, construction and operation of the proposed project would not create objectionable odors, nor would the project site be affected by any existing sources of substantial objectionable odors, and a ***less-than-significant*** impact related to objectionable odors would result.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

A project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development projects. The geographic context for the proposed project cumulative air quality analysis includes the City of Antioch and surrounding areas within the SFBAAB that are designated nonattainment for ozone and PM.

Global climate change is, by nature, a cumulative impact. Emissions of GHG contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change (e.g., sea level rise, impacts to water supply and water quality, public health impacts, impacts to ecosystems, impacts to agriculture, and other environmental impacts). A single project could not generate enough GHG emissions to contribute noticeably to a change in the global average temperature. However, the combination of GHG emissions from a project in combination with other past, present, and future projects could contribute substantially to the world-wide phenomenon of global climate change and the associated environmental impacts. Although the geographical context for global climate change is the Earth, for analysis purposes under CEQA and due to the regulatory context pertaining to GHG emissions and global climate change applicable to the proposed project, the geographical context for global climate change in this EIR is limited to the State of California.

4.2-5 Generation of a cumulatively considerable contribution to criteria air pollutant emissions. Based on the analysis below, the impact is *less than significant.*

The long-term emissions associated with operation of the proposed project in conjunction with other existing or planned development in the area would incrementally contribute to the region's exceedance of air quality thresholds. The BAAQMD 2011 thresholds established annual thresholds for emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$. The

proposed project's contribution to cumulative emissions of criteria air pollutants were calculated using CalEEMod and are presented in Table 4.2-10.

Table 4.2-10
Unmitigated Project Cumulative Emissions (tons/yr)

	ROG	NO_X	PM_{10}	$PM_{2.5}$
Proposed Project	7.73	5.36	5.25	1.53
BAAQMD Thresholds	10	10	15	10
Exceed Thresholds?	**NO**	**NO**	**NO**	**NO**

Source: CalEEMod, January 2015 (see Appendix C).

As shown in the table, the proposed project's unmitigated emissions would be below the applicable thresholds of significance for a cumulatively considerable contribution to regional criteria pollutant emissions. Therefore, the proposed project's incremental contribution to cumulative air quality impacts would be considered ***less than significant***.

Mitigation Measure(s)
None required.

4.2-6 Generation of a cumulatively considerable contribution to GHG emissions. Based on the analysis below, the impact is *less than significant.*

An individual project's GHG emissions are at a micro-scale level relative to global emissions and effects to global climate change; however, an individual project could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact. As such, impacts related to emissions of GHG are inherently considered cumulative impacts.

Implementation of the proposed project would cumulatively 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, to a lesser extent, other GHG pollutants, such as CH_4 and N_2O. Sources of GHG emissions include area sources, mobile sources or vehicles, utilities (electricity and natural gas), water usage, wastewater generation, and the generation of solid waste.

Construction GHG emissions are a one-time release and are, therefore, not typically expected to generate a significant contribution to global climate change. Neither the City nor BAAQMD has an adopted threshold of significance for construction-related GHG emissions. Nonetheless, the proposed project's construction GHG emissions have been amortized over the anticipated construction phase of the proposed project, which is assumed to be approximately seven years for this analysis, and included in the annual operational GHG emissions.[20] Utilizing the CalEEMod modeling software, the total annual unmitigated construction-related GHG emissions were estimated to be 5,515.04 $MTCO_2e$, or 787.86 $MTCO_2e$ per year over the seven-year construction phase.

Utilizing CalEEMod and taking into account construction-related emissions, the proposed project's total unmitigated GHG emissions were estimated and are presented in Table 4.2-11. The project's service population was estimated to be 1,879, based on 2.93 persons per household from the City of Antioch General Plan EIR.

Table 4.2-11
Unmitigated Project GHG Emissions

	Annual GHG Emissions
Operational GHG Emissions	7,614.68 $MTCO_2e$/yr
Construction-Related GHG Emissions[1]	787.86 $MTCO_2e$/yr
Total Annual GHG Emissions	8,402.54 $MTCO_2e$/yr
Total Annual Project GHG Emissions Per Service Population[2]	**4.47 $MTCO_2e$/SP/yr**
BAAQMD Threshold	4.6 $MTCO_2e$/SP/yr
Exceeds Threshold?	**NO**

[1] Total annual construction-related GHG emissions of 5,515.04 $MTCO_2e$/yr amortized over the seven-year construction phase.
[2] Service population for project calculated to be 1,879 based on 2.93 persons per household.

Source: CalEEMod, January 2015 (see Appendix C).

As shown in the above table, the project's total unmitigated annual GHG emissions, including construction-related emissions, were estimated to be approximately 4.47 $MTCO_2e$ per service population per year, which is below the threshold of significance for GHG emissions. It should be noted that the actual annual GHG emissions of the proposed project would be less than presented in Table 4.2-11, due to the one-time release of construction-related GHG emissions and implementation of the mitigation measures required in this chapter. Because the project's unmitigated annual GHG emissions would be below the 4.6 $MTCO_2e$ per service population per year threshold utilized by the City, the proposed project would be considered to result in a ***less-than-significant*** cumulative impact related to GHG emissions and global climate change.

Mitigation Measure(s)
None required.

Endnotes

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[17] California Air Resources Board. *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document*. August 19, 2011.

[18] California Air Resources Board, 2014. First Update to the Climate Change Scoping Plan building on the Framework. Available online at: http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm.

[19] http://www.arb.ca.gov/newsrel/2030_carbon_target_adaptation_faq.pdf.

[20] http://planbayarea.org/plan-bay-area.html.

[21] http://planbayarea.org/file10010.html.

[22] http://files.mtc.ca.gov/pdf/Plan_Bay_Area_FINAL/0-Introduction.pdf.

4.3 BIOLOGICAL RESOURCES

4.3 BIOLOGICAL RESOURCES

4.3.1 INTRODUCTION

The Biological Resources chapter evaluates the biological resources known to occur or potentially occur within the Vineyards at Sand Creek project site. This chapter describes potential impacts to those resources, and identifies measures to eliminate or substantially reduce those impacts to less-than-significant levels. In addition, existing plant communities, wildlife habitats, and the potential for special-status species and communities on the project site are discussed in the chapter. The information contained in this analysis is primarily based on the *Biological Resources Analysis* prepared by Monk & Associates (see Appendix D),[1] the *Biological Resources Analysis Peer Review* prepared for the project site by Gibson & Skordal, LLC (see Appendix E),[2] the *Tree Survey. Sand Creek Ranch Property* (see Appendix G),[3] the *City of Antioch General Plan*,[4] and the associated EIR.[5]

4.3.2 EXISTING ENVIRONMENTAL SETTING

The following sections describe the regional and project setting of the site, as well as the existing biological resources occurring in the proposed project area.

Regional Setting

The City of Antioch is located in Contra Costa County, in the East Bay region of the San Francisco Bay. The City is located along the San Joaquin-Sacramento River Delta and is a suburb of San Francisco and Oakland. The City of Antioch is bordered by the San Joaquin River (northern region), the City of Pittsburg (western region), and the Cities of Oakley and Brentwood (eastern region). The southern border of the City is adjacent to agricultural and open space areas on the flanks (lateral sides) of Mt. Diablo. The City encompasses approximately 50 square miles, including the area of the City's jurisdictional boundaries and sphere of influence.

Project Setting

The project site is surrounded by large plots of undeveloped land; however, area surrounding the project site is transforming from an agricultural use area to a residential and commercial development area. A portion of the project was previously operated by Shell Oil as an office and maintenance yard for petroleum pipeline operations on the project site. The soils affected by the Shell Oil operations were excavated, aired, and treated in accordance with the Toxics Remediation Plan completed under Regional Water Quality Control Board oversight; however, soils on this section remain highly disturbed. The proposed project site consists of 141.6 acres of land in Contra Costa County. The proposed project would be construction on a 141.6 acre project site, and also includes improvements that will be constructed on approximately 6.47 acres at offsite locations. The project site is identified by Assessor's Parcel Numbers 057-030-003 and 057-030-007. The proposed project includes the construction of approximately 650 residential units on lots ranging from 3,600 to 5,200 square feet. In addition, construction of parking lots, landscaping, access roads and other necessary infrastructure, multiple parks, an extension of

Sand Creek Road, and the construction of the Sand Creek Trail north of Sand Creek is included in development of the proposed project. As for the offsite improvements, the proposed project includes construction of a stormdrain outfall into Sand Creek as well as enhancements to Heidorn Ranch Road. Most of the project site drains via infiltration. In addition, the project site has been farmed, disked, and planted to wheat every year dating back to 1945. Repeated agricultural practices have been gradually leveling the site over many years due to agricultural production. As a result, the project site displays minimal changes in topography and elevation ranges from 150 feet to 175 feet above sea level.

On-Site Vegetation Communities

Monk and Associates (M&A) biologists examined the habitats and characterized the vegetation on the project site. A complete list of plants observed on the project site can be found in the M&A's *Biological Resource Analysis* (Appendix D). Due to repeated disking and manipulation of the soil on the project site, the entire project site is highly disturbed, and as a result, is dominated by limited vegetation and an agrestal plant community. An "agrestal" community is a weed dominated community of rural, agricultural areas. Sand Creek flows west to east along the southern boundary of the project site and supports infrequent occurring riparian vegetation. In addition, because of continuous human activity on the project site, ruderal plant communities exist on site. Therefore, three plant communities occur on the project site including, agrestal (farmed), ruderal (weedy), and riparian woodland (situated on banks of rivers).

As mentioned above, the project site is classified as an "agrestal habitat," which is the result of long-term ground manipulation and cultivation. During the multiple site investigations, dominant weeds were found on the project site including species such as dove weed (*Croton setiger*), morning-glory (*Convolvulus arvensis*), alkali mallow (*Malvella leprosa*), California burclover (*Medicago polymorpha*), common knotweed (*Polygonum aviculare*), short-podded mustard (*Hirschfeldia incana*), ripgut brome (*Bromus diandrus*), and slender oats (*Avena barbata*). Ruderal communities include grouping of plants that thrive in waste areas or sites that have been disturbed by human activity. Dominant plant species located within the project site include non-native species such as tumbleweed (*Salsola tragus*), soft chess (*Bromus hordeaceus*), harding grass (*Phalaris aquatica*), stinkwort (*Dittrichia graveolens*), wall barley (*Hordeum murinum leporinum*), tumbling oracle (*Atriplex rosea*), white pigweed (*Chenopodium album*), and yellow star thistle (*Centaurea solstitialis*).

Scattered riparian woodland is associated with Sand Creek. Tree species found in the riparian woodland along Sand Creek include valley oak (*Quercus lobata*), California buckeye (*Aesculus californica*), bluegum eucalyptus (*Eucalyptus globulus*), arroyo shallow (*Salix lasiolepis*), and big-leaf maple (*Acer macrophyllum*). Open, non-canopied habitats within Sand Creek allocate occurrences of herbaceous and shrubby understory plants. California rose (*Rosa californica*) grows in dense thickets along portions of the creek, while sneezeweed (*Helenium puberulum*), California sagebrush (*Artemisia californica*), California mugwort (*Artemisia douglasiana*), and white sweetclover (*Melilotus albus*) scatter along the creek banks. Annual beardgrass (*Polypogon monspeliensis*), cattails (*Typha latifolia*), brown-headed rush (*Juncus phaeocephalus* ssp. *paniculatus*), Baltic rush (*Juncus balticus* ssp. *ater*) and water cress (*Nasturtium officinale*) grow in scattered locations in the creek channel.

Special-Status Species

Special-status plant and animal species may meet one or more of the following criteria:

- Plants and animals that are listed or proposed for listing as threatened or endangered under the CESA (Fish and Game Code §2050 *et seq.*; 14 CCR §670.1 *et seq.*) or the FESA (50 CFR 17.12 for plants; 50 CFR 17.11 for animals; various notices in the Federal Register [FR] for proposed species);
- Plants and animals that are candidates for possible future listing as threatened or endangered under the FESA (50 CFR 17; FR Vol. 64, No. 205, pages 57533-57547, October 25, 1999); and under the CESA (California Fish and Game Code §2068);
- Plants and animals that meet the definition of endangered, rare, or threatened under the California Environmental Quality Act (CEQA) (14 CCR §15380) that may include species not found on either State or Federal Endangered Species lists;
- Plants occurring on Ranks 1A, 1B, 2A, 2B, 3, and 4 of CNPS' electronic *Inventory* (CNPS 2001). The California Department of Fish and Wildlife recognizes that Ranks 1A, 1B, 2A and 2B of the CNPS inventory contain plants that, in the majority of cases, would qualify for State listing, and the Department requests their inclusion in EIRs. Plants occurring on CNPS Ranks 3 and 4 are "plants about which more information is necessary," and "plants of limited distribution," respectively (CNPS 2001). Such plants may be included as special-status species on a case by case basis due to local significance or recent biological information (more on CNPS Rank species below)
- Migratory nongame birds of management concern listed by U.S. Fish and Wildlife Service (Migratory Nongame Birds of Management Concern in the United States: The list 1995; Office of Migratory Bird Management; Washington D.C.; Sept. 1995);
- Animals that are designated as "species of special concern" by the Department; and
- Animal species that are "fully protected" in California (Fish and Game Codes 3511, 4700, 5050, and 5515).

Table 4.3-1 provides a summary of the listing status and habitat requirements of sensitive species that have been documented within five miles of the project site for which potentially suitable habitat exists in the area CNDDB and CNPS. This table also includes an assessment of the likelihood of occurrence of each of these species in the site. The evaluation of the potential for occurrence of each species is based on the distribution of regional occurrences (if any), habitat suitability of the site, and field observations. It should be noted, that further analysis is included in this EIR for species that are known to have at least a low potential for occurrence on the project site.

Table 4.3-1
Special-Status Species Known To Occur Within 5 Miles of the Project Site

Common Name	Scientific Name	Status	Habitat	Potential for Occurrence in the Study Area
PLANTS				
Rhomboid bract saltbush	*Atriplex depressa*	Rank 1B.2	Chenopod scrub; playas; valley and foothill grassland; [alkaline or clay].	None. Not observed during appropriately timed surveys.
San Joaquin spearscale	*Atriplex joaquinana*	Rank 1B.2	Valley and foothill grassland.	None. Not observed during appropriately timed surveys.
Big tarplant	*Blepharizonia plumosa*	Rank 1B.1	Annual grasslands at elevations between 30 and 505 meters above sea level.	None. Not observed during appropriately timed surveys.
Round-leaved filaree	*California macrophylla*	Rank 1B.1	Cismontane woodland; valley and foothill grassland/clay.	None. This species was not detected on the project site.
Brewer's western flax	*Hesperolinon breweri*	Rank 1B.2	Chaparral; cismontane woodland; valley and foothill grassland; [mostly serpentinite].	None. No suitable habitat on the project site. Species not observed during appropriately timed surveys.
Show golden madia	*Madia radiata*	Rank 1B.1	Cismontane woodland; valley and foothill grassland.	None. No suitable habitat; site is currently heavily disturbed. Annual disking has occurred since 1940.
Antioch dunes evening -primrose	*Oenothera deltoides howellii*	FE CE Rank 1B.1	Interior dunes.	None. No suitable habitat on the project site.

Notes:
Rank 1B.1 = Seriously Endangered in California (over 80% occurrences threatened/high degree and immediacy of threat)
Rank 1B.2 = Fair Endangered in California (20-80% occurrences threatened)
FE = Federally Endangered
CE = California Endangered

(Continued on next page)

Table 4.3-1
Special-Status Species Known To Occur Within 5 Miles of the Project Site

Common Name	Scientific Name	Status	Habitat	Potential for Occurrence in the Study Area
WILDLIFE				
Amphibians				
California tiger salamander	*Ambystoma californiense*	Federally Threatened California Threatened	In Sonoma Co. is listed as Endangered by USFWS. Found in grassland habitats of the valleys and foothills. Requires burrows for aestivation and standing water until late spring (May) for larvae to metamorphose.	None. Project site has been disked annually since 1940, resulting in highly disturbed upland habitat.
California red-legged frog	*Rana draytonii*	Federally Threatened California Species of Special Concern	Occurs in lowlands and foothills in deeper pools and streams, usually with emergent wetland vegetation. Requires 11-20 weeks of permanent water for larval development.	Species present in Sand Creek. See Impacts and Mitigation section.
Birds				
Tricolored blackbird	*Agelaius tricolor*	Emergency listed on 12/3/14 by the California Fish and Game Commission	Colonial nester in dense cattails, tules, brambles or other dense vegetation. Requires open water, dense vegetation, and open grassy areas for foraging.	Low. Marginal nesting habitat in cattails within Sand Creek.
Western burrowing owl	*Athene cunicularia hypugaea*	California Species of Special Concern	Found in open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Potential to nest in burrows on site. Preconstruction nesting bird surveys shall be conducted. See Impacts and Mitigation section.
Swainson's hawk	*Buteo swainsoni*	California Threatened	Migratory and resident raptor that breeds in open areas with scattered trees. Prefers	Project site provides foraging habitat. Suitable nesting habitat along Sand Creek. Preconstruction

(Continued on next page)

Table 4.3-1
Special-Status Species Known To Occur Within 5 Miles of the Project Site

Common Name	Scientific Name	Status	Habitat	Potential for Occurrence in the Study Area
			riparian and sparse oak woodland habitats for nesting. Requires nearby grasslands, grain fields, or alfalfa for foraging.	nesting bird surveys shall be conducted. See Impacts and Mitigation section.
White-tailed kite	*Elanus caeruleus*	California "Fully Protected Species"	Found in lower foothills and valley margins with scattered oaks and along river bottomlands or marshes adjacent to oak woodlands. Nests in trees with dense tops.	Potential nesting habitat in Sand Creek. See Impacts and Mitigation section.
Loggerhead Shrike	*Lanius ludovicianus*	California Species of Special Concern	Inhabits areas with scattered shrubs, trees, posts, fences, utility lines, and other acceptable perching locations. Typically constructs a stick nest on a stable branch in a densely foliated tree or shrub.	Potential nesting habitat in Sand Creek. See Impacts and Mitigation section.
Vernal pool fairy shrimp	*Branchinecta lynchi*	Federally Threatened	Endemic to the grasslands of the Central Valley, central coast mountains, and south coast mountains. Inhabit static rainfilled/ vernal pools, small, clear water sandstone depression pools and grassed swale, earth slump, or basalt flow depression.	None. No suitable vernal pool habitat on site at this time. Site has been intensely farmed since 1940. Therefore, this species is not discussed further.

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Table 4.3-1
Special-Status Species Known To Occur Within 5 Miles of the Project Site

Common Name	Scientific Name	Status	Habitat	Potential for Occurrence in the Study Area
Vernal pool tadpole shrimp	*Lepidurus packardi*	Federally Endangered	Endemic to the grasslands of the Central Valley, central coast mountains, and south coast mountains. Inhabit static rainfilled/ vernal pools, small, clear water sandstone depression pools and grassed swale, earth slump, or basalt flow depression.	None. No suitable vernal pool habitat on site at this time. Site has been intensely farmed since 1940. Therefore, this species is not discussed further.
Mammals				
American badger	*Taxidea taxus*	California Species of Special Concern	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Need sufficient food, friable soils & open, uncultivated ground. Prey on burrowing rodents. Dig burrows. *(Continued on next page)*	None. No potential burrows of appropriate size discovered on the project site. Project site has been recently disked.
San Joaquin kit fox	*Vulpes macrotis mutica*	Federally Endangered California Threatened	Inhabits open grasslands with scattered shrubs. Needs loose-textured sand soils for burrowing.	Potential. Possible migration corridor. Preconstruction surveys shall be conducted. See Impacts and Mitigation section.
Reptiles				
Western pond turtle	*Emys marmorata*	California Species of Special Concern	Inhabits ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Needs suitable basking sites and upland habitat for egg laying. Occurs in the Central Valley and Contra Costa County.	Low. Sand Creek provides suitable habitat. Unlikely for western pond turtle to nest in uplands on site. See Impacts and Mitigation section.

Source: Biological Resource Analysis: The Vineyards At Sand Creek Antioch, Contra Costa County, California, 2014.

Special-Status Plant Species

Sensitive plants are those that are designated rare, threatened, or endangered and candidate species for listing by the USFWS. In addition, sensitive plans are designated and ranked by the California Native Plant Society (CNPS). Sensitive plants also include species considered rare or endangered under the conditions of Section 15380 of the CEQA Guidelines. Sensitive plants may include other species that are considered sensitive or of special concern due to limited distribution or lack of adequate information to permit listing or rejection for state or federal status.

The Biological Resources Analysis identifies seven special-status plant species as being recorded within five miles of the project site. The seven plant species include: Rhomboid bract saltbush (*Atriplex depressa),* San Joaquin spearscale (*Atriplex joaquinana),* big tarplant (*Blepharizonia plumose),* round-leaved filaree (*California macrophylla),* Brewer's western flax (*Hesperolinon breweri),* show golden madia (*Madia radiate),* and Antioch dunes evening primrose (*Oenothera deltoides howellii).* Due to the existing farmed conditions of the project site, special-status plants are not likely to occur on the project site; however, out of the seven species mentioned above, three rare plant species thrive in disturbed areas and have potential to occur on the project site. These special-status species include big tarplant, rhomboid bract saltbush, and round leaved filaree. On July 30, 2014 M&A botanists conducted a rare plant survey of the project site. Special-status plants were not identified on or adjacent to the project site during the botanical survey. Big tarplant and rhomboid bract saltbush were not observed during their known blooming periods during surveys conducted in 2005, 2006, or in 2014. Thus, M&A has concluded that the aforementioned plants do not occur on the project site and would not be impacted by the proposed project. Round-leaved filaree, while observed on a margin of the project site in 2005, was also not observed in 2006 or 2014; therefore, M&A concluded that the proposed project would not impact round-leaved filaree. All seven special-status plant species known to occur within two miles of the project site, and all other regionally known rare plants, are not expected to occur on the project site because of unsuitable conditions.

Special-Status Wildlife Species

A total of twelve special-status animal species are known to occur within five miles of the project site. Of these twelve species, only the California red-legged frog has been recorded in Sand Creek. In addition, potentially suitable habitat exists in the project site for eight other species.

California Red-Legged Frog

The California red-legged frog (*Rana draytonii*) is listed as Federally Threatened and a California Species of Concern. The California red-legged frog is typically found in ponds, slow-flowing portions of perennial and intermittent streams that maintain water in the summer months. The frog is also found in hillside seeps that maintain pool environments or saturated soils throughout the summer months. In addition, the red-legged frogs use upland habitats for migration and dispersal. Records reveal four accounts of this species within two miles of the project site; therefore, Sand Creek is an occupied habitat of the California red-legged frog. As Sand Creek is regarded as occupied, lands adjacent to the creek including the project site constitute potential upland dispersal habitat for the frog and as a result, the proposed project would impact potential California red-legged frog dispersal habitat. Furthermore, installation of

the outfall structure on the bank and bed of Sand Creek will also result in impacts to known occupied California red-legged frog habitat.

California Tiger Salamander

The California tiger salamander (CTS) (Ambystoma californiense), Central California Distinct Population Segment, was federally listed as threatened on August 4, 2004. On August 19, 2010, the CTS was also state listed as a threatened species under the CESA. The Service designated critical habitat for the Central California DPS in 2005. The project site is located outside of the closest mapped critical habitat for the Central California DPS which is Critical Habitat Unit 18 designated in Alameda County (Central Valley Geographic Unit 18, Map 14).

CTS occur in grasslands and open oak woodlands that provide suitable over summering and/or breeding habitats. CTS spend the majority of their lives underground. They typically only emerge from their subterranean refugia for a few nights each year during the rainy season to migrate to breeding ponds. Adult California tiger salamanders have been observed up to 2,092 meters (1.3 miles) from breeding ponds (USFWS 2004). As such, unobstructed migration corridors are an important component of CTS habitat.

CTS emerge during the first heavy, warm rains of the year, typically in late November and early December. In most instances, larger movements of CTS do not occur unless it has been raining hard and continuously for several hours. Typically, for larger movements of CTS to occur nighttime temperatures also must be above 48° F. CTS are able to move over, through or around almost all obstacles. Significant obstructions that block CTS movements include freeways and other major (heavy traffic) roads, rivers, and deep, vertical or near vertical sided, concrete irrigation/flood control ditches.

During the spring, summer, and fall months, most known populations of the CTS predominately use California ground squirrel burrows as over-summering habitat (Jennings and Hayes 1994; G. Monk personal observation). Other secondary subterranean refugia, or primary refugia where California ground squirrels are absent, likely include Botta's pocket gopher burrows, deep fissures in desiccated clay soils, and debris piles (e.g. downed wood, rock piles).

Stock ponds, seasonal wetlands, and deep vernal pools typically provide most of the breeding habitat used by CTS. In such locations, CTS attach their eggs to rooted, emergent vegetation, and other stable filamentous objects in the water column. Eggs are gelatinous and are laid singly or occasionally in small clusters. Eggs range in size from about ¾ the diameter of a dime to the full diameter of a dime. Occasionally CTS are found breeding in slow-moving, streams or ditches. Ditches and/or streams that are subject to rapid flows, even if only on occasion, typically will not support or sustain CTS egg attachment through hatching, and thus, are not usually used successfully by CTS for breeding (G. Monk and S. Lynch, pers. observations). Similarly, streams and/or ditches that support predators of CTS or their eggs and larvae such as fish, bullfrogs, red swamp crayfish, or signal crayfish, almost never constitute suitable breeding habitat.

Typically seasonal wetlands that are used for breeding must hold water into the month of May to allow enough time for larvae to fully metamorphose. In dry years, seasonal wetlands may dry too early to allow enough time for CTS larvae to successfully metamorphose. Under such circumstances, desiccated CTS larvae can be found in dried pools. In addition, as pools dry down to very small areas of inundation, CTS larvae become concentrated and are very susceptible to

predation. However, in years exhibiting wet springs, these same pools can remain inundated long enough through continual rewetting to allow CTS larvae ample time to successfully metamorphose.

The closest record for CTS occurs 0.60 mile south of the project site (CNDDB Occurrence No. 856). CTS larvae are recorded to occur in a pond at this location. There are eight additional CTS records known from within two miles of the project site (Figure 4). Regardless, as the project site has been disked annually since the early 1940s, the project site does not provide suitable over-summering upland habitat for CTS, and the site does not provide any breeding habitat for this species. No record of California ground squirrel control was found, however there are no ground squirrels on the actively farmed project site. The Shell/Aera site has a few California ground squirrel burrows of recent origin. However, this portion of the project site was subjected to a contaminant remediation project that removed all soils from the prior developed site thereby removing any potential that this area provides any upland over summering habitat that could be used by the CTS. As such, no suitable CTS habitat will be affected by the proposed project. Thus, no impacts to CTS are anticipated from the proposed project.

Western Pond Turtle

The western pond turtle (*Emys marmorata*) is a California Species of Special Concern. The western pond turtle inhabits a wide range of fresh and saline waters and permanent and intermittent water bodies. The turtle species is found in ponds, marshes, ditches, streams, and rivers that have rocky or muddy bottoms. This turtle is most often found in aquatic environments with plant communities dominated by watercress, cattail, and other aquatic vegetation. The western pond turtle is aquatic and usually only leaves the aquatic site to reproduce and to overwinter. In addition, the western pond turtle also requires upland areas where the species digs nests and buries its eggs. The closest CNDDB record for western pond turtle is located 4.80 miles south of the project site in Marsh Creek Reservoir. Sand Creek provides potentially suitable habitat for the western pond turtle. Installation of the outfall structure on the bank and bed of Sand Creek may result in impacts to suitable western pond turtle habitat.

Western Burrowing Owl

The western burrowing owl (*Athene cunicularia hypugaea*) is a California Species of Special Concern and is protected from direct take under the Migratory Bird Treaty Act (50 CFR 10.13). In addition, the western burrowing owl's nest, eggs, and young are also protected under California Fish and Game Code (§3503, §3503.5, and §3800). Western burrowing owl habitat is usually found in annual and perennial grasslands, characterized by low-growing vegetation. The burrowing owl typically utilizes rodent burrows for nesting and cover in which they use annually. Burrowing owls spend the majority of their time sitting at the entrances of their burrows, and as a result, grazed grasslands seem to be their preferred habitat. The closest CNDDB record to the project site where western burrowing owls have been recorded is 0.10 mile to the southeast of the project site south of Sand Creek. Although the project site is disturbed, evidence of western burrowing owls has not been identified, and rodent burrows are few, the small Shell/Aera parcel on site provides marginal habitat conditions for western burrowing owl. Therefore, the western burrowing owl has the potential to occur on site.

Swainson's Hawk

The Swainson's hawk (*Buteo swainsonii*)) is a California Threatened species and is protected from direct take under the Migratory Bird Treaty Act (50 CFR 10.13). In addition, the Swainson's hawk's nest, eggs, and young are also protected under California Fish and Game Code (§3503, §3503.5, and §3800). The Swainson's hawk inhabits open to semi-open areas at low to middle elevations in valleys, dry meadows, foothills, and level uplands. The Swainson's hawk generally forages in open habitats with short vegetation and nests in isolated trees that are located along drainages, in wetlands, or around farmsteads. The closest CNDDB record for the species is 0.10 mile southeast of the project site in a large valley oak tree. Swainson's hawks have not been detected using or nesting on or adjacent to the project site during multiple project site surveys; however, the Shell/Aera parcel on site and trees in Sand Creek adjacent to the project site provide suitable nesting habitat.

White-Tailed Kite

The White-Tailed Kite (*Elanus caeruleus)* is considered a "Fully Protected" species under the California Fish and Game Code (§3511). Fully protected birds may not be "taken" or possessed (i.e., kept in captivity) at any time. It is also protected from direct take under the Migratory Bird Treaty Act (50 CFR 10.13). The white-tailed kite is typically found foraging in grassland, marsh, or cultivated fields where there are trees or shrubs for nesting and perching. In addition, the white-tailed kite nest in a wide variety of trees and tall bushes. The nearest CNDDB record of this species was recorded 1.50 miles northeast of the project site. The open grassland community provides suitable hunting grounds for white-tailed kites, and the trees on and immediately adjacent to the project site along Sand Creek provide potentially suitable nesting habitat.

Loggerhead Shrike

The loggerhead shrike (Lanius ludovicianus) is a California Species of Special Concern and is protected from direct take under the Migratory Bird Treaty Act (50 CFR 10.13). In addition, the loggerhead shrike's nest, eggs, and young are also protected under California Fish and Game Code (§3503, §3503.5, and §3800). The shrike is a small bird of open and often arid habitats and prefers areas various perching locations. This shrike preys upon insects and small birds, mammals, amphibians, reptiles, and aquatic species. It typically constructs a stick nest on a stable branch in a densely foliated tree or shrub. The conversion of rural areas into subdivisions or commercial areas steadily reduces the available habitat for the loggerhead shrike. The nearest CNDDB record for the species is located 4.10 miles northeast of the project site. In addition, a loggerhead shrike was identified near the project site during the survey on July 30, 2014. Ruderal habitat and the riparian woodland provide suitable hunting grounds for loggerhead shrikes, and the trees on and immediately adjacent to the project site along Sand Creek provide potentially suitable nesting habitat.

Tricolored Blackbird

The tricolored blackbird (*Agelaius tricolor)* was emergency listed on December 3, 2014 by the California Fish and Game Commission. According to the California Endangered Species Act, the Commission may list a species when there is an imminent danger. Once listing is approved, the bird is protected for six months, after which time the listing may be renewed for another six months. The Commission will likely consider a formal listing petition sometime in the spring of

2015. It has no federal status. The tricolored blackbird is typically found foraging in grassland areas with open water and dense vegetation. Tricolored blackbirds are colonial nesters, and require dense cattail, tules, and brambles to nest in. The closest known CNDDB record for this species is located 3.90 miles south of the project site. Although no tricolored blackbirds have been detected on the site during multiple site surveys, construction activities adjacent to the creek and installation of the outfall structure in Sand Creek could disturb nesting birds. Furthermore, Sand Creek provides potential nesting habitat within the creek corridor.

San Joaquin Kit Fox

The San Joaquin kit fox (*Vulpes macrotis mutica*) is a federally listed endangered species protected pursuant to the Federal Endangered Species Act and is considered a California Threatened species. This fox species is usually found in open grassland and shrub land communities, but has also been observed in ruderal plant communities. The San Joaquin kit fox is carnivorous, usually feeding on small rodents. In addition, the San Joaquin kit fox relies on dens for breeding and generally consist of excavated and loose-textured soils. The closest CNDDB record for this species is located 3.50 miles northwest of the project site. Because the San Joaquin fox's presence has not been documented in Contra Costa County, it is probable that the kit fox is extirpated from Contra Costa County. However, the project site could conceivably be used as a migration corridor by the San Joaquin kit fox.

Sensitive Natural Communities

Wetlands are areas that are saturated by surface or ground water at a frequency and duration to support a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands usually must possess plants adapted to saturated conditions, wetland hydrology, and soils that are periodically or permanently saturated. On the dates of June 23, June 27, and August 21, 2014, M&A conducted a wetland delineation of the project site (see Figure 4.3-1). A wetland delineation identifies which water bodies within a project's boundaries meet the definition of "waters of the United States." A draft wetland delineation map was submitted to the USACE along with a request for a Jurisdictional Determination in September 2014. As mentioned previously in this Biological chapter, the project site has been disked and planted to wheat every year dating back to 1945. As a result, the project site exhibits minimal depression topography. Sand Creek occurs just south of the project site and flows west to east along the southern project site boundary. This creek receives urban runoff from developments to the northwest, and from a larger as yet undeveloped watershed further to the northwest. The average distance between ordinary high water marks in Sand Creek is 12 feet and it is approximately 70 to 150 feet wide between the top-of-banks. Sand Creek is incised approximately 20 feet down below the existing grade of the project site and has steeply-sloped banks and a flood plain terrace near the top of the banks.

Figure 4.3-1
Jurisdictional Waters of the United States Map

Sensitive Trees

Forty-seven established trees are located within the proposed project site and offsite improvement areas. It should be noted that a total of seven trees have been taken off the arborist's tree inventory list. Five of the seven trees (No.'s 17, 32, 40, 41, and 44) have been removed because they do not meet the criteria for an established tree. Additionally, two small Black Walnut trees (No.'s. 39 and 45) are located offsite on the property located north of the future Prewett Ranch Road. The remaining trees surveyed have not been renumbered, and are listed below in Table 4.3-2, the Vineyards at Sand Creek Tree Inventory List. It should be noted that the multiple diameter at breast height (DBH) measurements result from the tree having multiple stems or trunks.

4.3.3 REGULATORY CONTEXT

The following is a description of federal, state, and local environmental laws and policies that are relevant to the California Environmental Quality Act (CEQA) review process.

Federal Regulations

Federal Endangered Species Act

The United States Congress passed the Federal Endangered Species Act (FESA) in 1973 to protect endangered species or species that are threatened with extinction. The FESA is intended to operate in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend.

The FESA prohibits the "take" of endangered or threatened wildlife species. "Take" is defined as harassing, harming (including significantly modifying or degrading habitat), pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species, or any attempt to engage in such conduct (16 USC 1532, 50 CFR 17.3). Taking can result in civil or criminal penalties.

The FESA and NEPA Section 404 guidelines prohibit the issuance of wetland permits for projects that would jeopardize the existence of threatened or endangered wildlife or plant species. Section 7(a)(2) of the FESA requires that each federal agency consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that any action authorized, funded or carried out by such agency is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of critical habitat for listed species. Critical habitat designations mean: (1) specific areas within a geographic region currently occupied by a listed species, on which are found those physical or biological features that are essential to the conservation of a listed species and that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a listed species that are determined essential for the conservation of the species. The U.S. Army Corps of Engineers (USACE) must consult with the USFWS and National Oceanic Atmospheric Administration (NOAA) when threatened or endangered species may be affected by a proposed project to determine whether issuance of a Section 404 permit would jeopardize the species.

Table 4.3-2
Vineyards at Sand Creek Tree Inventory List

ID #	Tree Species	DBH (inches)	Remove	Indigenous (protected)	Mature (Protected)
1	Eucalyptus	28,22	Yes	*n/a*	Yes
2	Eucalyptus	20,30	Yes	*n/a*	Yes
3	Black Walnut	12,8	No	*n/a*	*n/a*
4	Black Walnut	18	No	*n/a*	*n/a*
5	Black Locust	24	No	*n/a*	*n/a*
6	Black Locust	32	No	*n/a*	Yes
7	Eucalyptus	12	No	*n/a*	*n/a*
8	Eucalyptus	42,16	No	*n/a*	Yes
9	Eucalyptus	32	No	*n/a*	Yes
10	Eucalyptus	18	Yes	*n/a*	*n/a*
11	Eucalyptus	16,17	Yes	*n/a*	*n/a*
12	Eucalyptus	12,6	Yes	*n/a*	*n/a*
13	Eucalyptus	22,20	Yes	*n/a*	*n/a*
14	Black Walnut	22	Yes	*n/a*	*n/a*
15	Eucalyptus	22	Yes	*n/a*	*n/a*
16	Ash	20	Yes	*n/a*	*n/a*
18	Ash	16	Yes	*n/a*	*n/a*
19	Redwood	12	Yes	*n/a*	*n/a*
20	Ash	12,8	Yes	*n/a*	*n/a*
21	Ash	12,24	Yes	*n/a*	*n/a*
22	Monterey Pine	14	Yes	*n/a*	*n/a*
23	Eucalyptus	8,12,19,6,6	Yes	*n/a*	*n/a*
24	Eucalyptus	19,8,12,12	Yes	*n/a*	*n/a*
25	Eucalyptus*	50	Yes	*n/a*	Yes
26a	Eucalyptus	42	Yes	*n/a*	Yes
26b	Eucalyptus	40	Yes	*n/a*	Yes
27	Eucalyptus	12,10,18,12	Yes	*n/a*	*n/a*
28	Eucalyptus	8,10,11,8	Yes	*n/a*	*n/a*
29	Aleppo Pine	14	Yes	*n/a*	*n/a*
30	Aleppo Pine	28,29,32	Yes	*n/a*	Yes
31	Redwood	16	Yes	*n/a*	*n/a*
33	Almond	12	Yes	*n/a*	*n/a*
34	Almond	12	Yes	*n/a*	*n/a*
35	Stone Pine	30	Yes	*n/a*	Yes
36	Stone Pine	24	Yes	*n/a*	*n/a*
37	Silk Oak	18	Yes	*n/a*	*n/a*
38	Palm	12	Yes	*n/a*	*n/a*
42	Eucalyptus	23	Yes	*n/a*	*n/a*
43	Eucalyptus	18	Yes	*n/a*	*n/a*
46	Black Walnut	9,13,13	Yes	*n/a*	*n/a*
47	Almond	42	Yes	*n/a*	Yes
48	Willow	8,8,7,10,8,6,4	No	*n/a*	*n/a*
49	Almond	18,18,12,8,6	No	*n/a*	*n/a*
50	Valley Oak	8	No	Yes	*n/a*
51	Almond	12,16	No	*n/a*	*n/a*

*Notes: * The tree species is a landmark tree.*
Source: Stewart's Tree Service, Inc. Tree Survey. Sand Creek Ranch Property. July 2014.

Applicability to the Proposed Project

Sand Creek does not provide habitat for anadromous fish species. The USACE initiated Section 7 consultation with NOAA's National Marine Fisheries Service (NMFS) on December 6, 2007 regarding the adjacent Aviano Development Project (USACE File Number SPK – 200500628). NMFS provided a Section 7 consultation letter on March 18, 2008 which concluded that "the proposed project would not directly impact listed anadromous fish species because Sand Creek is not inhabited by listed anadromous fish. NMFS concurs that the adjacemt proposed Aviano project is not likely to adversely affect listed species." Based on the NMFS conclusions, consultation with NMFS would not be required for the Vineyards at Sand Creek Project.

Sand Creek provides known habitat for the California red-legged frog, and the project site provides habitat that would be regarded by the USFWS as potential migration habitat for the San Joaquin kit fox. While "suitable habitat" may be provided by the project site, this does not imply that San Joaquin kit fox are present on the project site, or that the project site supports San Joaquin kit fox. Suitability only infers the project site could support the species in question either temporarily or permanently.

Because the proposed project would likely be regarded by the Service as impacting habitat that supports California red-legged frog and migration habitat that potentially could be used by the San Joaquin kit fox, which are protected pursuant to the FESA, it is most likely that incidental take authorization will be required from the Service for the proposed project prior to the time the proposed project could commence. Since the proposed project includes an outfall structure on the bank of Sand Creek and thus will require a permit from the USACE, the USACE is required to consult with the USFWS pursuant to Section 7 of the FESA prior to the time it could issue a permit for the proposed project.

Migratory Bird Treaty Act

Raptors (birds of prey), migratory birds, and other avian species are protected by a number of State and federal laws. The federal Migratory Bird Treaty Act of 1918 (MBTA) (16 U.S.C. §§ 703-712) prohibits the killing, possessing, or trading of migratory birds except in accordance with regulations prescribed by the Secretary of the Interior.

Applicability to the Proposed Project

Birds of prey such as the Swainson's hawk, white-tailed kite, red-tailed hawk, red shouldered hawk, and burrowing owl are all known to nest in the region of the project site. Inactive raptor nests were found in bluegum eucalyptus (Eucalyptus globulus) on and adjacent to the project site that provide suitable nesting habitat for these species. Similarly, many common passerine bird species could nest on the project site. All raptors (birds of prey) are subject to the MBTA. Also, the common songbirds and wading birds are also protected pursuant to this Act. As long as there is no direct mortality of species protected pursuant to this Act caused by development of the site, there should be no constraints to development of the site. While adult birds can typically fly out of harm's way, nesting birds, their eggs and young are much more prone to being impacted by

construction projects. To comply with the MBTA all active nest sites would have to be avoided while birds were nesting. Upon completion of nesting, the proposed project could commence as otherwise planned. Please review specific requirements for avoidance of nest sites for potentially occurring nesting birds in the Impacts and Mitigations section below.

State Regulations

California Endangered Species Act

In 1984, the State of California enacted the California Endangered Species Act (CESA) (Fish and Game Code §2050). It is similar to the FESA but pertains only to State-listed endangered and threatened species. If a proposed project would result in take of a State listed species, an "incidental take" permit pursuant to Section 2081 of the Fish and Game Code is required. No Section 2081 permit may authorize the take of a species for which the Legislature has imposed strict prohibitions on all forms of "take." These species are listed in several statutes that identify "fully protected" species and "specified birds." See Fish and Game Code §§3505, 3511, 4700, 5050, 5515, and 5517. The CESA requires State agencies to consult with the CDFW when preparing California Environmental Quality Act (CEQA) documents to ensure that the actions of the lead agency do not jeopardize the existence of listed species. Lead agencies are directed by the CESA to consult with CDFW on projects or actions that could affect listed species. In addition, the CESA directs CDFW to determine whether jeopardy would occur, and allows CDFW to identify "reasonable and prudent alternatives" to the project consistent with conserving the species. Agencies can approve a project that affects a listed species if they determine that "overriding considerations" exist; however, the agencies are prohibited from approving projects that would result in the extinction of a listed species.

The California Endangered Species Act prohibits the taking of State-listed endangered or threatened plant and wildlife species. The CDFW exercises authority over mitigation projects involving State-listed species, including those resulting from CEQA mitigation requirements. Taking may be authorized by CDFW if an approved habitat management plan or management agreement that avoids or compensates for possible jeopardy is implemented. In addition, CDFW requires preparation of mitigation plans in accordance with published guidelines.

Applicability to the Proposed Project

The CTS is a state listed species that will not be impacted by the proposed project. Swainson's hawk, tricolored blackbird and San Joaquin kit fox are state listed species; however, the proposed project will not result in direct take of these species, following implementation of the proposed mitigation measures, as detailed in the Impacts and Mitigation section below. Consequently, the proposed project should not be required to obtain an Incidental Take Permit (ITP) from the State of California

California Department of Fish and Wildlife (CDFW)

The CDFW exercises jurisdiction over wetland and riparian resources associated with rivers, streams, and lakes under CDFW Code Section 1600 to 1607. The CDFW has the authority to regulate work that would do any one or more of the following:

1) Divert, obstruct, or change the natural flow of a river, stream, or lake;
2) Change the bed, channel, or bank of a river, stream, or lake; or
3) Use material from a streambed.

The CDFW asserts that the jurisdictional area along a river, stream, or creek is usually bounded by the top-of-bank or the outermost edges of riparian vegetation. Typical activities regulated by CDFW under Section 1600-1607 authority include installing outfalls, stabilization of banks, creek restoration, implementing flood control projects, constructing river and stream crossings, diverting water, damming streams, gravel mining, logging operations, and jack-and-boring.

Careful project design, including the minimization of impacts and reduction of hard structure surface area (i.e., minimal amounts of cement or rip-rap), is critical for CDFW approval. The CDFW emphasizes the use of biotechnical or bioengineered creek-related components (emphasis on natural materials, sometimes in conjunction with hard materials) that minimize the need for hard structures in creeks.

Applicability to the Proposed Project

Any project modifications to Sand Creek would be subject to the Department's jurisdiction pursuant to Section 1602 of the California Fish and Game Code. The applicant will be applying for a SBAA with the Department for the proposed outfall structure that will be constructed as part of the proposed project on the northern bank of Sand Creek.

CDFW Species of Special Concern

In addition to formal listing under FESA and CESA, plant and wildlife species receive additional consideration during the CEQA process. Species that may be considered for review are included on a list of "Species of Special Concern" developed by the CDFW. Species whose numbers, reproductive success, or habitat may be threatened are tracked by CDFW in California.

CDFW Birds of Prey Protection

California Fish and Game Code §§ 3503, 3503.5, 3511, and 3513 prohibit the "take, possession, or destruction of birds, their nests or eggs." All raptors (that is, hawks, eagles, owls) their nests, eggs, and young are protected under California Fish and Game Code § 3503.5. Additionally, "fully protected" birds, such as the white-tailed kite (Elanus leucurus) and golden eagle (Aquila chrysaetos), are protected under California Fish and Game Code § 3511. "Fully protected" birds may not be taken or possessed (that is, kept in captivity) at any time. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of

reproductive effort is considered "taking" by the CDFW. Such a take would also violate federal law protecting migratory birds (Migratory Bird Treaty Act).

Applicability to the Proposed Project

Raptors that are known to nest in the region of the project site and for which suitable nesting habitat is provided by the nesting project site include Swainson's hawk, white-tailed kite, red-tailed hawk, red shouldered hawk, and burrowing owl. Many common passerine birds also could nest on the project site. Preconstruction nesting surveys would have to be conducted for nesting birds to ensure that there is no direct take of these birds including their eggs, or young, during the construction of the proposed project. Any active nests that are found during preconstruction surveys would have to be avoided by the proposed project. Suitable non-disturbance buffers should be established around nest sites until the nesting cycle is complete. More specifics on nesting bird surveys and protection buffers are provided below in the Impacts and Mitigations section.

California Native Plant Society

The California Native Plant Society (CNPS) maintains a list of plant species native to California that have low numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Plants of California. Potential impacts to populations of CNPS-listed plants receive consideration under CEQA review. The following identifies the definitions of the CNPS listings:

List 1A: Plants believed extinct.
List 1B: Plants rare, threatened, or endangered in California and elsewhere.
List 2: Plants rare, threatened, or endangered in California, but more numerous elsewhere.
List 3: Plants about which more information is needed - a review list.
List 4: Plants of limited distribution - a watch list.

Additionally, in 2006 CNPS updated their lists to include "threat code extensions" for each list. For example, Rank 1B species would now be categorized as Rank 1B.1, Rank 1B.2, or Rank 1B.3. These threat codes are defined as follows:

- .1 is considered "seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)";
- .2 is "fairly endangered in California (20-80% of occurrences threatened)";
- .3 is "not very endangered in California (less than 20% of occurrences threatened or no current threats known)."

U.S. Army Corps Of Engineers (USACE)

This section presents an overview of the criteria used by the USACE to determine those areas within a project area that would be subject to their regulation.

Section 404 of the Clean Water Act

Congress enacted the Clean Water Act "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (33 U.S.C. §1251(a)). Pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344), the USACE regulates the disposal of dredged or fill material into "waters of the United States" (33 CFR Parts 328 through 330). This requires project applicants to obtain authorization from the USACE prior to discharging dredged or fill materials into any water of the United States.

In the Federal Register "waters of the United States" are defined as, "...all interstate waters including interstate wetlands...intrastate lakes, rivers, streams (including intermittent streams), wetlands, [and] natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce..." (33 CFR Section 328.3).

Section 404 jurisdiction in "other waters" such as lakes, ponds, and streams, extends to the upward limit of the ordinary high water mark (OHWM) or the upward extent of any adjacent wetland. The OHWM on a non-tidal water is:

- the "line on shore established by the fluctuations of water and indicated by physical characteristics such as a clear natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter or debris; or other appropriate means that consider the characteristics of the surrounding areas" (33 CFR Section 328.3[e]).

Wetlands are defined as: "...those areas that are inundated or saturated by surface or ground water at a frequency and duration to support a prevalence of vegetation adapted for life in saturated soil conditions" (33 CFR Section 328.8 [b]). Wetlands usually must possess hydrophytic vegetation (i.e., plants adapted to inundated or saturated conditions), wetland hydrology (e.g., topographic low areas, exposed water tables, stream channels), and hydric soils (i.e., soils that are periodically or permanently saturated, inundated or flooded) to be regulated by the USACE pursuant to Section 404 of the Clean Water Act.

Permitting in USACE Jurisdictional Areas

Pursuant to Section 404 of the Clean Water Act, the USACE normally provides two alternatives for permitting impacts to the type of "waters of the United States" found in the proposed project area. The first alternative would be to use Nationwide Permit(s) (NWP). The second alternative is to apply to the USACE for an Individual Permit (33 CFR Section 235.5(2)(b)).

NWPs are a type of general permit administered by the USACE and issued on a nationwide basis that authorize minor activities that affect USACE regulated waters. Under a NWP, if certain conditions are met, the specified activities can take place without the need for an individual or regional permit from the USACE (33 CFR, Section 235.5[c][2]). In order to use NWP(s), a project must meet one of 27 general nationwide permit conditions, and all specific conditions pertaining to the NWP being used (as presented at 33 CFR Section 330, Appendices A and C).

On April 10, 2008, the USACE and the Environmental Protection Agency (EPA) issued a Final Mitigation Rule governing mitigation requirements for unavoidable impacts to wetlands and other waters of the United States under the section 404 program of the Clean Water Act (USACE 2008). 70 Fed. Reg. 19594. In this Rule the USACE and the EPA established a new approach to mitigating the loss of wetlands and waters resulting from projects they permit under section 404 the Clean Water Act. This approach is summarized as follows:

- Establish, to the extent feasible, equivalent standards for all forms of compensatory mitigation (i.e., mitigation banks, in-lieu fee programs, and permittee-responsible mitigation) and thus level the playing field and promote mitigation banking;
- Encourage watershed-based decisions on the best locations of mitigation sites;
- Require measurable, enforceable ecological performance standards for mitigation;
- Encourage the use of science-based assessment methods to evaluate impacts on wetlands and waters and the success of mitigation;
- Require written mitigation plans, suitable financial assurances, and legal arrangements to ensure long term protection of mitigation sites;
- Require regular performance monitoring of mitigation;
- Affirm the "sequential approach" to mitigation in which the USACE first considers avoidance of impacts, then minimization of impacts, and finally compensation for unavoidable impacts.

The Mitigation Rule also establishes a preference hierarchy for mitigation options for projects that impact waters of the U.S. as follows:

1. Mitigation bank credits
2. In-lieu fee program credits
3. Permittee-responsible mitigation under a watershed approach
4. On-site and/or in-kind permittee-responsible mitigation
5. Off-site and/or out-of-kind permittee-responsible mitigation

Applicability to the Proposed Project

Sand Creek, an intermittent creek, is immediately south of the project site. It flows west to east along the southern project site boundary. Sand Creek is a tributary to Marsh Creek, which is a tributary to the San Joaquin River, a Traditional Navigable Water of the U.S. Therefore, Sand Creek would be regulated as "waters of the U.S." pursuant to Section 404 of the Clean Water Act. A small portion of this creek will be affected by the proposed construction of a stormwater outfall structure. The proposed outfall structure will result in permanent impacts (fill) to 330 square feet (0.008 acre) (60 cubic yards of riprap) below the Ordinary High Water Mark (OHWM) of Sand Creek. The remaining portions of Sand Creek south of the project site will be preserved by the proposed project.

In addition, M&A mapped a linear "other waters" roadside ditch along the western shoulder of Heidorn Ranch Road. This ditch receives stormwater runoff from adjacent impervious surfaces of Heidorn Ranch Road and sheet water flows from adjacent properties. Unlike sheet water flows from the project site that flow towards Sand Creek, which ultimately flow to Marsh Creek and

the San Joaquin River, this ditch flows north to a City of Antioch Stormdrain inlet. The City stormdrain system ultimately has multiple connections with the San Joaquin River/Sacramento River complex. The San Joaquin River flows into the Sacramento River that flows to the San Francisco Bay. Thus, this ditch (other waters) has indirect connectivity to a water of the U.S. A total of 0.02 acre (303 linear feet) of "other waters" ditch would be impacted by the proposed project.

Since the proposed project will result in impacts to waters of the U.S., the proposed project likely meets conditions to use Nationwide Permits (NWPs) that are administered by the USACE pursuant to Section 404 of the Clean Water Act. The project will require the USACE's authorization to use NWP 7 (Stormwater Outfall), NWP 29 (Residential Development), and NWP 33 (Temporary Construction, Access and Dewatering). A notification (i.e., known as a Preconstruction Notice) must be filed with the USACE's District Engineer to obtain authorization to use these NWPs.

State Water Resources Control Board (SWRCB) and Regional Water Quality Control Board (RWQCB)

This section presents an overview of the criteria used by the SWRCB and RWQCB to determine those areas within a project area that would be subject to their regulation.

Section 401 of the Clean Water Act

The SWRCB and RWQCB regulate activities in "waters of the State" (which includes wetlands) through Section 401 of the Clean Water Act. While the USACE administers a permitting program that authorizes impacts to waters of the United States, including wetlands and other waters, any USACE permit authorized for a proposed project would be inoperative unless it is a NWP that has been certified for use in California by the SWRCB, or if the RWQCB has issued a project specific certification or waiver of water quality. Certification of NWPs requires a finding by the SWRCB that the activities permitted by the NWP will not violate water quality standards individually or cumulatively over the term of the permit (the term is typically for five years). Certification must be consistent with the requirements of the federal Clean Water Act, the California Environmental Quality Act, the California Endangered Species Act, and the SWRCB's mandate to protect beneficial uses of waters of the State. Any denied (i.e., not certified) NWPs, and all Individual USACE permits, would require a project specific RWQCB certification of water quality.

Applicability to the Proposed Project

The impacts to Sand Creek from the outfall construction and the roadside ditch during road widening along Heidorn Ranch Road may be authorized by use of NWP by the USACE. To become operative, the USACE's NWP authorization will require a water quality certification by the RWQCB pursuant to Section 401 of the Clean Water Act.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act, Water Code § 13260, requires that "any person discharging waste, or proposing to discharge waste, that could affect the waters of the State to file a report of discharge" with the RWQCB through an application for waste discharge (Water Code Section 13260(a)(1). The term "waters of the State" is defined as any surface water or groundwater, including saline waters, within the boundaries of the State (Water Code § 13050(e)).

The RWQCB generally considers filling in waters of the State to constitute "pollution." Pollution is defined as an alteration of the quality of the waters of the state by waste that unreasonably affects its beneficial uses (Water Code §13050(1)). The RWQCB litmus test for determining if a project should be regulated pursuant to the Porter-Cologne Water Quality Control Act is if the action could result in any "threat" to water quality.

The RWQCB requires complete pre- and post-development Best Management Practices Plan (BMPs) of any portion of the project site that is developed. This means that a water quality treatment plan for the pre- and post-developed project site must be prepared and implemented. Preconstruction requirements must be consistent with the requirements of the National Pollutant Discharge Elimination System (NPDES). That is, a *Stormwater Pollution Prevention Plan* (SWPPP) must be developed prior to the time that a site is graded (see NPDES section below). In addition, a post construction BMPs plan, or a Stormwater Management Plan (SWMP) must be developed and incorporated into any site development plan.

Applicability to the Proposed Project

If the USACE determines there are waters of the U.S. on the project site (or within offsite areas of impact) these features would also be regarded as waters of the state. The RWQCB would have regulatory authority over these areas pursuant to Section 401 of the Clean Water Act. If the USACE determines there are "isolated waters" on the project site that are not within federal jurisdiction, these features would nonetheless be regarded as waters of the state and would be regulated by RWQCB pursuant to the Porter-Cologne Water Quality Control Act. Pre and post construction BMPs will be incorporated into the proposed project implementation plans.

M&A mapped isolated "other waters" swales and pools on the shoulders of Heidorn Ranch Road. These features do not have hydrologic connectivity to any "water of the U.S." They are topographic low areas that are not within a drainage pattern except only as roadside surface flows spill into these low areas that have no release points to any tributary system. These "isolated" features typically would not be regulated by the USACE. However, these isolated features nonetheless would be regulated as "waters of the State." A total of 0.11 acre of isolated waters of the State would be impacted by the proposed project.

National Pollutant Discharge Elimination System (NPDES)

In 1972 the Clean Water Act was amended to state that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with an NPDES permit. While federal regulations allow two permitting options for stormwater discharges (individual permits and General Permits), the SWRCB has elected to adopt only one statewide Construction General Permit at this time that will apply to all stormwater discharges associated with construction activity, except from those on Tribal Lands, in the Lake Tahoe Hydrologic Unit, and those performed by the California Department of Transportation (CalTrans). The Construction General Permit requires all dischargers where construction activity disturbs greater than one acre of land or those sites less than one acre that are part of a common plan of development or sale that disturbs more than one acre of land surface to:

1. Develop and implement a Storm Water Pollution Prevention Plan (SWPPP) which specifies BMPs that will prevent all construction pollutants from contacting stormwater with the intent of keeping all products of erosion from moving off site into receiving waters.
2. Eliminate or reduce non-stormwater discharges to storm sewer systems and other waters of the nation.
3. Perform inspections of all BMPs.

This General Permit is implemented and enforced by the nine RWQCBs.

In 2009, the California SWRCB adopted NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities ("Construction General Permit"). The Construction General Permit was issued pursuant to the federal Clean Water Act. The Construction General Permit does not completely carry forward the former qualitative and self-selected compliance approach based on preparation of a SWPPP. Instead, developers and construction contractors must implement specific BMPs, achieve quantitatively-defined (i.e., numeric) pollutant-specific discharge standards, and conduct much more rigorous monitoring based on the proposed project's projected risk level.

The State Water Board's new quantitative standards take a two-tiered approach, depending on the risk level associated with the site in question. Exceedance of a benchmark Numeric Action Level ("NAL") measured in terms of pH and turbidity (a measure related to both the amount of sediment in and the velocity of site runoff) triggers an additional obligation to implement additional BMPs and corrective action to improve SWPPP performance. New minimum BMPs include Active Treatment Systems, which may be necessary where traditional erosion and sediment controls do not effectively control accelerated erosion; where site constraints inhibit the ability to construct a correctly-sized sediment basin; where clay and/or highly erosive soils are present; or where the site has very steep or long slope lengths.

In addition, the Construction General Permit includes several "post-construction" requirements. These requirements entail that site designs provide no net increase in overall site runoff and match pre-project hydrology by maintaining runoff volume and drainage concentrations. To achieve the required results where impervious surfaces such as roofs and paved surfaces are

being increased, developers must implement non-structural off-setting BMPs, such as landform grading, site design BMPs, and distributed structural BMPs (bioretention cells, rain gardens, and rain cisterns). This "runoff reduction" approach is essentially a State Water Board-imposed regulatory requirement to implement Low Impact Development ("LID") design features. Volume that cannot be addressed using non-structural BMPs must be captured in structural BMPs that are approved by the RWQCB.

Applicability to the Proposed Project

The applicant will be responsible for obtaining coverage under the General Permit prior to commencement of construction activities since the proposed project will disturb greater than one acre of area.

Local Regulations

The following are the local government's environmental policies relevant to biological resources.

City of Antioch General Plan

The Antioch General Plan objectives and policies relating to the protection of biological resources that are applicable to the proposed project are presented below.

Open Space

Objective 10.3.1 Maintain, preserve, and acquire open space and its associated natural resources by providing parks for active and passive recreation, trails, and by preserving natural, scenic, and other open space resources.

Policy 10.3.2.e Require proposed development projects containing significant natural resources (e.g. sensitive habitats, habitat linkages, steep slopes, cultural resources, wildland fire hazards, etc.) to prepare Resource Management Plans to define appropriate responses to General Plan policies calling for their protection or preservation. The purpose of the Resource Management Plan is to look beyond the legal status of species at the time the plan is prepared, and provide a long-term plan for conservation and management of the natural communities found onsite. Resource Management Plans shall accomplish the following.

- Determine the significance of the resources that are found on-site and their relationship to resources in the surrounding area, including habitat linkages and wildlife movement corridors;

- Define areas that are to be maintained in long-term open space based on the significance of on-site resources and their relationship to resources in the surrounding area; and
- Establish mechanisms to ensure the long term protection and management of lands retained in open space.

Biological Resources

Objective 10.4.1 Preserve natural streams and habitats supporting rare and endangered species of plants and animals.

Policy 10.4.2.a Comply with the Federal policy of no net loss of wetlands through avoidance and clustered development. Where preservation in place is found not to be feasible (such as where a road crossing cannot be avoided, or where shore stabilization or creation of shoreline trails must encroach into riparian habitats), require 1) on-site replacement of wetland areas, 2) off-site replacement, or 3) restoration of degraded wetland areas at a minimum ratio of one acre of replacement/restoration for each acre of impacted onsite habitat, such that the value of impacted habitat is replaced.

Policy 10.4.2.b Preserve in place and restore existing wetlands and riparian resources along the San Joaquin River and other natural streams in the Planning Area, except where a need for structural flood protection is unavoidable.

Policy 10.4.2.c Require appropriate setbacks adjacent to natural streams to provide adequate buffer areas ensuring the projection of biological resources, including sensitive natural habitat, special-status species habitats and water quality protection.

Policy 10.4.2.d Through the project approval and environmental review processes, require new development projects to protect sensitive habitat areas, including, but not limited to, oak woodlands, vernal pools, and native grasslands. Ensure the preservation in place of habitat areas found to be occupied by State and federally protected species.

- If impacts to sensitive habitat areas are unavoidable, appropriate compensatory mitigation

shall be required off-site within eastern Contra Costa County. Such compensatory mitigation shall be implemented through the provisions of a Resources Management Plan (RMP) as described in Policy 10.3.2.e, except where, in the discretion of the Community Development Director, an RMP is not necessary or appropriate due to certain characteristics of the site and the project. Among the factors that are relevant to determining whether an RMP is necessary or appropriate for a given project are the size of the project and the project site, the location of the project (e.g., proximity to existing urban development or open space), the number and sensitivity of biological resources and habitats on the project site, and the nature of the project (e.g., density and intensity of development).

- Where preserved habitat areas occupy areas that would otherwise be graded as part of a development project, facilitate the transfer of allowable density to other, non-sensitive portions of the site.

Policy 10.4.2.e Limit uses within preserve and wilderness areas to resource-dependent activities and other uses compatible with the protection of natural habitats (e.g., passive recreation and public trails).

Policy 10.4.2.f Through the project review process, permit the removal of healthy, mature oak trees on a case-by-case basis only where it is necessary to do so.

Policy 10.4.2.g Preserve heritage trees, require the incorporation of native vegetation, and avoid the introduction of invasive species in the landscape plans for new development.

Sand Creek Focus Area of the General Plan

The following policies relate to the protection of biological resources and apply to development within the Sand Creek Focus Area of the General Plan.

Policy 4.4.6.7s Adequate buffer areas adjacent to the top of banks along Sand Creek shall protect sensitive plant and amphibian habitats and water quality shall be provided. Adequate buffer areas shall also be provided along the edge of existing areas of permanently preserved open space

adjacent to the Sand Creek Focus Area, including but not limited to Black Diamond Mines Regional Park. Buffers established adjacent to existing open space areas shall be of an adequate width to minimize light/glare, noise, fire safety, public safety, habitat, public access impacts within the existing open space areas, consistent with the provisions of Section 10.5, Open Space Transitions and Buffers Policies of the General Plan.

Policy 4.4.6.7t Because of the sensitivity of the habitat areas within the Sand Creek Focus Area, and to provide for mitigation of biological resources impacts on lands in natural open space, a Resource Management Plan attached as Appendix A to this General Plan shall be prepared and approved prior to development of the Sand Creek Focus Area.

Policy 4.4.6.7u A viable, continuous grassland corridor between Black Diamond Mines Regional Preserve and Cowell Ranch State Park shall be retained using linkages in the southwestern portion of the Lone Tree Valley (within the Sand Creek drainage area), Horse Valley, and the intervening ridge. The primary goal of preserving such a corridor is to allow for wildlife movement between Black Diamond Mines Regional Preserve and Cowell Ranch State Park. Completion of such a corridor is contingent upon the cooperation with the City of Brentwood and Contra Costa County, each of whom may have land use jurisdiction over portions of this corridor.

Policy 4.4.6.7w To mitigate the impacts of habitat that would be lost to future development within the Focus Area, an appropriate amount of habitat shall be preserved on- or off-site per the compensatory provisions of the Framework Resources Management Plan prepared for the Sand Creek Focus Area (attached as Appendix A of the General Plan).

Policy 4.4.6.7x Ponds, wetlands, and alkali grassland associated with upper Horse Creek shall be retained in natural open space, along with an appropriate buffer area. If impacts on the Horse Creek stream and riparian downstream are unavoidable to accommodate infrastructure, appropriate compensatory mitigation shall be required off-site per

the provisions of the Resource Management Plan attached as Appendix A to this General Plan.

Policy 4.4.6.7y Chaparral, scrub, and rock outcrop community within the western portion of the (Sand Creek) Focus Area (west of Empire Mine Road), as well as adjacent grassland community that is suitable habitat for the Alameda whipsnake (*masticophis lateralis euryxanthus*) shall be retained in natural open space. Within other portions of the Focus Area, the chaparral, scrub, and rock outcrop shall be retained in natural open space contiguous to the required grassland linkage to protect the grassland linkage south of the chaparral, scrub, and outcrop community.

Policy 4.4.6.7z Within the western portion of the Focus Area (west of Empire Mine Road), the oak woodland and savanna community shall be preserved in natural open space. Within other portions of the Focus Area, the oak woodland and savanna community shall be preserved in natural open space where it overlaps the rock outcrop community.

City of Antioch Tree Ordinance

According to the City of Antioch's Zoning Ordinance, Article 12: Tree Preservation and Regulation (Section 9-5.1205), tree removal for the Vineyards at Sand Creek Project is evaluated as part of the "regular development application process." In deciding whether to approve the removal of a tree, or require its preservation, the City considers whether the tree being evaluated is considered a landmark, indigenous, mature, or established tree. In addition, the City would also evaluate the tree's appearance, species type, and aesthetic compatibility with the proposed project.

The City's Design Requirements under the Subdivision Ordinance (Section 9-4.617), requires the removal of all trees that conflict with grading, utilities, or improvements in the public right-of-way. Therefore, the trees within the Heidorn Ranch Road and Sand Creek Road right-of-way that conflict with roadway improvements must be removed. The trees in which the City authorizes removal, must be replaced. The City's Tree Preservation and Regulation Ordinance (Section 9-5.1205) requires two 24-inch box trees for each established tree, two 48-inch box trees for each mature tree, and the City Council has discretion in determining the appropriate ratio of box tree replacement for any landmark or indigenous trees. The City of Antioch's Tree Ordinance defines six categories of trees:

- An established tree is any tree that is at least ten inches in diameter, at diameter at breast height (DBH). DBH is measured 4.5 feet above natural or finished grade.

- An indigenous tree is a naturally growing tree of the following species: Blue Oak (*Quercus douglasii*), Valley Oak (*Quercus lobata*), Coast Live Oak (*Quercus agrifolia*), Canyon Live Oak (*Quercus chrysolepis*), Interior Live Oak (*Quercus wislizenii*), California Buckeye (*Aesculus californica*), and California Bay (*Umbellularia californica*)
- A landmark tree is any tree that is at least 48 inches in DBH and/or is over 40 feet in height.
- A mature tree is any tree which is at least 26 inches in DBH.
- A street tree is any tree planted within a public right-of-way and/or a tree planting easement.
- A protected tree is any tree required to be preserved as a condition of an approval from a regular development application.

4.3.4 IMPACTS AND MITIGATION MEASURES

This section describes the standards of significance and methodology utilized to analyze and determine the proposed project's potential impacts related to biological resources. A discussion of the project's impacts, as well as mitigation measures, are also presented.

Standards of Significance

For the purposes of this EIR, the following standards of significance were adapted from Appendix G of the CEQA Guidelines. Impacts are considered significant if implementation of the proposed project would do any one or more of the following:

- 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 CDFW or USFWS;
- 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 CDFW or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to marshes, vernal pools, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- 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;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- Have a substantial adverse effect on the environment by converting oak woodlands; and/or
- Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other local, regional, or State habitat conservation plan.

An evaluation of whether an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish or result in the loss of an important biological resource, or impacts that would conflict with local, State, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important, but not significant according to CEQA. The reason for this is that although the impacts would result in an adverse alteration of existing conditions, the impacts would not substantially diminish or result in the permanent loss of a defined important resource on a population-wide or region-wide basis.

Method of Analysis

The *Biological Resource Analysis* prepared for the proposed project by M&A is based on a review of biological resource databases, inventories, regional literature on both plants and animals. The field survey was conducted at the project site by M&A Biologists on July 30, 2014. The biological study conducted for the project site complies with State and local sources of information, including the California Department of Fish and Wildlife and the California Native Plant Society. The final determinations for collected plants were made by keying specimens using standard references from the *Jepson Manual* (Hickman 1993). The surveys were conducted at the proper time of year when special-status and locally significant plants were both evident and identifiable. The surveys were conducted in a manner that is consistent with conservation ethics and accepted plant collection and documentation techniques. All areas of the project site were examined by walking systematic meandering transects through potential habitat, and by closely examining any existing microhabitats that could potentially support special-status plants. In addition, all plant species were identified to the level needed to determine whether they qualify as special-status plants.

Project-Specific Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in comparison with the standards of significance identified above.

4.3-1 Impacts to special-status plants. Based on the analysis below, the impact is *less than significant.*

M&A biologists conducted a rare plant survey and identified seven special-status plant species as having been recorded within five miles of the project site, but do not have the potential to occur on-site due to site disturbance. Because impacts from implementation of the proposed project will not affect rare plants, construction on the project site would have a ***less-than-significant*** impact on special-status plants.

Mitigation Measure(s)
None required.

4.3-2 Impacts to the California red-legged frog. Based on the analysis below, with implementation of mitigation, the impact would be *less than significant*.

The California red-legged frog is listed as Federally Threatened and a California Species of Concern. Records reveal four records of this species within two miles of the project site.

In 2005, adult California red-legged frogs were observed in Sand Creek upstream of the project site. Sand Creek provides suitable breeding and dispersal habitat for the California red-legged frog; therefore, Sand Creek is considered occupied habitat of the California red-legged frog. In addition, lands adjacent to Sand Creek including the project site constitute potential upland dispersal habitat for this frog. Therefore, the proposed project will impact up to 141.6 acres of potential California red-legged frog dispersal habitat. In addition, included within the 141.6 acres, installation of the stormwater outfall structure on the bank and bed of Sand Creek would occur from the development of the proposed project and would result in impacts to known potential habitat for the frog species. Thus, impacts related to the California red-legged frog, as a result of the proposed project, are considered ***potentially significant***.

Mitigation Measure(s)
The following mitigation measure(s) would reduce the impacts to the California red-legged frog to a *less-than-significant* level.

4.3-2(a) *Prior to the issuance of a grading permit for project site grading and the installation of the outfall structure in Sand Creek, an education program shall be conducted by a qualified biologist to explain the endangered species concerns to contractors/operators working at the project site. This education/training program shall include a description of the frog and its habitat, a review of the Endangered Species Act and the federal listing of the frog, the general protection measures to be implemented to protect the frog and minimize take, and a delineation of the limits of the work area.*

4.3-2(b) *A qualified 10(a)(1)(A) biologist shall conduct preconstruction surveys of the creek work areas no more than 14 days prior to dewatering and other work activities. If any California red-legged frogs are identified in the work area, the Service and the Department shall be notified and, if permitted, relocated outside of the work area.*

4.3-2(c) *The work areas adjacent to Sand Creek shall be isolated with suitable amphibian exclusion fencing (see below) that would block the movement of California red-legged frogs from entering the work areas. This fence shall be installed prior to the time any site grading or other construction-related activities are implemented. The fence shall remain in place during site grading or other construction-related activities and shall prevent frogs from entering the project site work areas.*

While normally California red-legged frog exclusion fencing consists of silt fencing, owing to the duration of the development project, a more weather resilient fence is recommended. The exclusion fence shall consist of a 4-foot wall of ¼-inch mesh, galvanized wire (i.e., welded wire hardware cloth- no woven wire would be allowed) or other commercially available exclusion fencing (e.g. ERTEC Fence). Initially, staking would be installed along the route of the exclusion fencing in a 4 inch deep trench. Then, the bottom of the fence would be firmly seated in the trench. The fencing above the ground would be anchored to metal staking with wire. Finally, the top 10-inches or less would be bent over in a semi-circle towards the outside of the fence to ensure that the fence cannot be climbed. This fence would be expected to last the duration of the construction period for the development project.

4.3-2(d) *A qualified biologist shall be onsite when grading activities occur within 300 feet of Sand Creek to conduct daily inspections of the fencing and to otherwise ensure that stranded animals are salvaged and relocated back to the stream channel. The biological monitor shall be responsible for ensuring that the wildlife exclusion fencing is not compromised, and shall notify the onsite contractor representative when fencing needs to be repaired.*

4.3-2(e) *All construction work in Sand Creek associated with the outfall structure shall be scheduled for the dry season (May 15 through October 15) and when there is reduced flow in Sand Creek. No work shall occur when water is flowing within the work area. Any necessary in-drainage work when there are flows shall be isolated from flows via the installation of temporary coffer dams that have flow-through bypass pipes. Flows shall be diverted around isolated work areas either by gravity flow or if necessary by pumping water around the work area. No silty water shall be allowed to reenter the tributary below any in-drainage work area. Methods and materials shall be adapted in the field to match the size, shape, and anticipated flow volume of the drainage, and pre-approved by the biological monitor. All diversions shall conform to the following provisions:*

- *Drainage diversion shall be practiced only where deemed unavoidable by the proposed project engineer and biological monitor.*
- *Diversion shall be limited to the minimum time period necessary to complete the work and restore the channel.*
- *Construction equipment would work from above the top-of-bank unless equipment is authorized to operate below the top-of-bank by the Department, Service, USACE, and/or RWQCB pertaining to their respective jurisdictions. Unless permitted by these agencies within their respective jurisdictions, there shall be no vehicle*

passage, vehicle parking, or materials storage below the top of bank.

- *All in-drainage and diversion work plans shall reflect and incorporate standard erosion control measures and BMP's as prescribed in the Project's SWPPP.*
- *In certain cases where water seeps into the dewatered area, sump pits may be excavated in the work area and seepage water would then be pumped back upstream behind the coffer dam. All discharged water shall be silt free. If silt is a problem, water shall be pumped through a silt sock into baker tank(s) prior to discharge back into the channel.*
- *All downstream flows shall be maintained throughout the period that coffer dams are installed.*
- *The entire work area below the top of bank, including the coffer dam location, shall be restored to the approximate pre-construction contours and would be stabilized as necessary to withstand the expected high water flows. All dam materials shall be completely removed from the channel when work is complete, and not be disposed of in or near the channel.*
- *A qualified 10(a)(1)(A) biologist shall conduct preconstruction surveys for California red-legged frog prior to isolating any work area within Sand Creek. If any frogs are found in the work area, the Service and the Department shall be notified, and the frogs shall be moved from the work area to up or downstream areas of Sand Creek, whichever is closest to the capture site. Upon completion of the survey, coffer dams may be installed. Any isolated water shall be seined by the proposed project biologist to search for frogs prior to pumping water out of the isolated work areas.*
- *The project biological monitor shall be present during all in-drainage work. Dewatered work areas shall not result in stranded aquatic wildlife.*
- *All trash that might attract predators to the project site shall be properly contained and removed from the site and disposed of regularly. All construction debris and trash shall be removed from the site when construction activities are complete.*
- *All fueling and maintenance of equipment and vehicles, and staging areas shall be at least 20 meters from Sand Creek. The construction personnel shall ensure that contamination of California red-legged frog habitat does not occur and shall have a plan to promptly address any accidental spills.*

4.3-2(f) *To mitigate for impacts to federally listed species, including impacts to the California red-legged frog, the applicant shall preserve 272 acres as offsite mitigation (hereinafter called the Marsh Creek Property) located*

off Marsh Creek Road in eastern Contra Costa County. An alternative mitigation property approved by the Service that possesses comparable biological resources for the affected federally listed species may also be used for mitigation in lieu of the Marsh Creek Property. The Marsh Creek Property is located immediately north of and adjacent to East Bay Regional Park District's (EBRPD) Round Valley Regional Preserve. The geographic location of the Marsh Creek Property adjacent to EBRPD Round Valley Regional Park makes it a valuable preservation property that would add permanently preserved acreage to existing regionally significant preserved lands (Round Valley Regional Preserve).

There is a 1982 record for California red-legged frogs along Marsh Creek on the Marsh Creek Property (CNDDB Occurrence No. 546), and a total of 79 reported occurrences of California red-legged frogs within 5 miles of the property. Hence, the habitat to be preserved at this mitigation property supports grassland habitat that provides upland dispersal habitat and aquatic habitat for California red-legged frogs, and Marsh Creek provides potential breeding habitat for California red-legged frog. The combination of breeding habitat in proximity to suitable upland habitat is most important for the ongoing viability of the California red-legged frog populations.

While the proposed project would not likely impact the California tiger salamander, preservation of the Marsh Creek Property shall nonetheless provide benefits to this salamander. There is a 1982 record for California tiger salamander in a pond in annual grassland adjacent to Marsh Creek, located 0.24 mile upstream from the Marsh Creek Property (CNDDB Occurrence No. 170), and a total of 69 reported occurrences of California tiger salamanders within 5 miles of the Marsh Creek Property. Owing to the abundance of known California tiger salamander records in the vicinity of the Marsh Creek Property and the presence of a robust California ground squirrel colony within the grasslands on the property, which provide necessary refugia habitats for California tiger salamanders, the Marsh Creek Property would most likely be regarded by the U.S. Fish and Wildlife Service and the Department of Fish and Wildlife as supporting suitable upland over-summering habitat for this salamander. Therefore, the proposed mitigation site would provide appropriate mitigation for impacts to 141.6 acres of long-term disked agricultural land (has been farmed annually since at least 1945 based upon aerial photograph research completed by M&A).

4.3-2(g) *The project proponent shall record a conservation easement over the Marsh Creek Property preserving it in perpetuity as wildlife habitat. The easement shall be granted to a qualified conservation organization such as the EBRPD. The project proponent shall also establish an endowment fund to provide for the long-term management, maintenance, and*

monitoring of the mitigation site. A Resource Management Plan (RMP) shall be developed for the management of natural resources to be preserved on the Marsh Creek Property.

4.3-3 Impacts to the western pond turtle. Based on the analysis below and with implementation of mitigation, the impact to the western pond turtle would be *less than significant.*

The western pond turtle is a California Species of Special Concern. The closest CNDDB record for western pond turtle is located 4.80 miles south of the project site in Mash Creek Reservoir (CNDDB Occurrence No. 131). Sand Creek provides potentially suitable habitat for the western pond turtle. Sand Creek's deeply incised channel with steep sloped banks make it unlikely that a western pond turtle would nest at the project site. However, Sand Creek could potentially provide suitable habitat for the species. Installation of the proposed outfall structure on the bank and bed of Sand Creek may result in impacts to suitable western pond turtle habitat; therefore, impacts related to the western pond turtle as a result of the proposed project are considered ***potentially significant***.

Mitigation Measure(s)

The following mitigation measure(s) would reduce the impacts to the western pond turtle to a *less-than-significant level*.

4.3-3 *A qualified biologist shall conduct a preconstruction survey of the work area in Sand Creek, and if a western pond turtle is identified in the work area, the turtle will be relocated to suitable habitat downstream. The work areas adjacent to Sand Creek shall be isolated with exclusion fencing that will prevent western pond turtle from entering the work site and accidentally being harmed by construction activities.*

The deeply incised channel with steep slopes makes it very unlikely that a western pond turtle would climb up onto the project site to nest. As such, no potential nesting sites are likely to be affected by the proposed project. Regardless, preconstruction surveys for turtle nest sites in uplands adjacent to suitable aquatic habitat during spring and summer months shall be conducted within 30 days prior to beginning any activities. If no nests are found, no further consideration for western pond turtle nests is warranted. If nest sites are located during preconstruction surveys adjacent to a proposed work area, the nest site plus a 50-foot buffer around the nest site shall be fenced where it intersects a project work area to avoid impacts to the eggs or hatchlings which over-winter at the nest site. In addition, if nest(s) are located during surveys, moth balls (naphthalene) should be sprinkled around the vicinity of the nest (no closer than 10 feet) to mask human scent and discourage predators.

Construction at the nest site and within the 50-foot buffer area shall be delayed until the young leave the nest (this could be a period of many

months) or as otherwise advised and directed by the Department, the agency responsible for overseeing the protection of the pond turtle. If the Department allows translocation of any nestling pond turtles this shall be completed by a qualified biologist under the direction of the Department.

A 272 acre Mitigation Property shall be preserved along Marsh Creek Road in eastern Contra Costa County (or an alternative mitigation property with comparable biological resource values may also be used for mitigation in lieu of the Marsh Creek Property) to compensate for project related impacts to the California red-legged frog and the San Joaquin kit fox (see mitigation measures for these two species). Marsh Creek runs west to east through the Marsh Creek Property. This creek supports optimal western pond turtle basking pools and supports suitable nesting habitat that can be used by the western pond turtle. Thus, the permanent preservation of the Marsh Creek Property required to compensate for project impacts to the California red-legged frog and the San Joaquin kit fox will also benefit the western pond turtle.

4.3-4 Impacts to western burrowing owl. Based on the analysis below and with implementation of mitigation, the impact would be *less than significant*.

The western burrowing owl is a California Species of Special Concern and is covered by the Migratory Bird Treaty Act and the California Fish and Game Code Sections 3503, 3503.5. The western burrowing owl has not been identified on the project site since the 1940s; however, because the project site provides suitable habitat for the burrowing owl and is within the species' known range, the possibility exists that the project could have a ***potentially significant*** impact to the western burrowing owl.

Mitigation Measure(s)
The following mitigation measures would reduce the above-mentioned impact to a *less-than-significant* level.

4.3-4(a) *Within 14 days of commencement of ground disturbance, burrowing owl surveys shall be conducted by walking the entire project site and (where possible) in areas within 150 meters (approx. 500 feet) of the proposed project impact zone. The 150-meter buffer zone is surveyed to identify burrows and owls outside of the proposed project area which may be impacted by factors such as noise and vibration (heavy equipment) during project construction.*

Pedestrian survey transects shall be spaced to allow 100 percent visual coverage of the ground surface. The distance between transect center lines shall be 7 meters to 20 meters and shall be reduced to account for differences in terrain, vegetation density, and ground surface visibility. Poor weather may affect the surveyor's ability to detect burrowing owls thus, avoid conducting surveys when wind speed is greater than 20

kilometers per hour and there is precipitation or dense fog. To avoid impacts to owls from surveyors, owls and/or occupied burrows shall be avoided by a minimum of 50 meters (approx. 160 ft.) wherever practical to avoid flushing occupied burrows. Disturbance to occupied burrows shall be avoided during all seasons.

4.3-4(b) *If burrowing owls are detected on the site, the following restricted activity dates and setback distances are recommended per the Department's Staff Report (2012):*

- *From April 1 through October 15, low disturbance and medium disturbance activities shall have a 200 meter buffer while high disturbance activities shall have a 500 meter buffer from occupied nests.*
- *From October 16 through March 31, low disturbance activities shall have a 50 meter buffer, medium disturbance activities shall have a 100 meter buffer, and high disturbance activities shall have a 500 meter buffer from occupied nests.*
- *No earth-moving activities or other disturbance shall occur within the aforementioned buffer zones of occupied burrows. These buffer zones shall be fenced as well. If burrowing owls were found in the proposed project area, a qualified biologist would also need to delineate the extent of burrowing owl habitat on the site.*

4.3-4(c) *The proposed preservation of the Marsh Creek Mitigation Property shall preserve 272 acres that will benefit western burrowing owls. The permanent preservation of this mitigation land provides suitable mitigation for impacts that would occur to 141.6 acres of marginal western burrowing owl habitat. The Marsh Creek Property supports grassland habitat and a robust California ground squirrel population that provides suitable habitat for western burrowing owls.*

4.3-5 Impacts to Swainson's hawk. Based on the analysis below and with implementation of mitigation, the impact would be *less than significant.*

The Swainson's hawk is a California Threatened species and is protected from direct take pursuant to the Migratory Bird Treaty Act. In addition, Swainson's hawk eggs and nests are protected under California Fish and Game Code 3503.5 and 3513. However, in the absence of nesting season surveys, impacts to the Swainson's hawk are considered potentially significant. Potential impacts to this species from the proposed project include disturbance to nesting birds and the loss of foraging habitat. Although Swainson's hawks are not known to currently nest on the project site, an identified Swainson's hawk nesting record occurs 0.10-mile south of the project site, along Sand Creek. Therefore, the project site constitutes suitable nesting and foraging habitat, resulting in a ***potentially significant*** impact.

Mitigation Measure(s)

The following mitigation measures would reduce the above impact to Swainson's hawks to a *less-than-significant* level.

4.3-5 *To avoid impacts to nesting Swainson's hawks, the Department has prepared guidelines for conducting surveys for Swainson's hawk entitled: Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (CDFG 2000). These survey recommendations were developed by the Swainson's Hawk Technical Advisory Committee (TAC) to maximize the potential for locating nesting Swainson's hawks, and thus, reduce the potential for nest failures as a result of project activities and/or disturbances. To meet the Department's recommendations for mitigation and protection of Swainson's hawks in this guideline, surveys shall be conducted by a qualified raptor biologist for a 0.25-mile radius around all project activities and shall be completed for at least two survey periods as is found in the Department's 2000 survey guidelines (CDFG 2000). The guidelines provide specific recommendations regarding the number of surveys based on when the proposed project is scheduled to begin and the time of year the surveys are conducted. A copy of this survey report shall be provided to the City of Antioch prior to starting construction.*

The applicant shall prepare a Swainson's Hawk Monitoring and Habitat Management Plan if a qualified raptor biologist determines that a nest site could be impacted or project activities could otherwise cause "take" of the Swainson's hawk, its eggs, or young. If take could occur as determined by a qualified raptor biologist, protective buffers shall be established on the project site that shall prevent such take from occurring. The protective buffer shall be maintained until such time that the Swainson's hawks have completed their nesting cycle as determined by a qualified raptor biologist. The nest protection buffer shall be coordinated with the Department.

In addition, the 272 acre Marsh Creek Mitigation Property (or an alternative mitigation property with comparable biological resources) shall compensate for project related impacts from the loss of the 141.6 acres of project site farmland that constitutes suitable foraging habitat for the Swainson's hawk. Mitigation that compensates for the loss of suitable Swainson's hawk foraging habitat shall include the preservation of the 272 acre Marsh Creek Property, which supports grasslands that provide suitable foraging habitat for Swainson's hawks.

4.3-6 Impacts to nesting raptors. Based on the analysis below and with implementation of mitigation, the impact would be *less than significant.*

Large stick nests in the bluegum eucalyptus on and adjacent to the project site, and in mature trees along Sand Creek indicate that raptors have nested on and adjacent to the project site in the recent past. White-tailed kite, red-tailed hawk, and red shouldered hawk all are known from the area, and conceivably they could nest on or adjacent to the project site within a zone of influence, in future years. All of the aforementioned raptors are protected under the Migratory Bird Treaty Act and their eggs and young are protected under California Fish and Game Codes Sections 3503, 3503.5. Any project-related impacts to these species would be considered a significant adverse impact. Potential impacts to these species from the proposed project include disturbance to nesting birds, and possibly death of adults and/or young. Therefore, construction of the proposed project could have a ***potentially significant*** impact to nesting raptors.

Mitigation Measure(s)
The following mitigation measures would reduce impacts to nesting raptors to a *less-than-significant* level.

4.3-6 *In order to avoid impacts to nesting raptors, a nesting survey shall be conducted within 14 days prior to commencing with construction if this work would commence between February 1st and August 31st. The raptor nesting surveys shall include examination of all trees within 300 feet of the entire project site, not just trees slated for removal.*

If nesting raptors are identified during the surveys, the dripline of the nest tree must be fenced with orange construction fencing (provided the tree is on the project site), and a 300-foot radius around the nest tree must be staked with bright orange lath or other suitable staking. If the tree is located off the project site, then the buffer shall be demarcated per above where the buffer intersects the project site. The size of the buffer may be altered if a qualified raptor biologist conducts behavioral observations and determines the nesting raptors are well acclimated to disturbance. If this occurs, the raptor biologist shall prescribe a modified buffer that allows sufficient room to prevent undue disturbance/harassment to the nesting raptors. No construction or earth-moving activity shall occur within the established buffer until it is determined by a qualified raptor biologist that the young have fledged (that is, left the nest) and have attained sufficient flight skills to avoid project construction zones. This typically occurs by August 1st. This date may be earlier or later, and would have to be determined by a qualified raptor biologist. If a qualified biologist is not hired to watch the nesting raptors then the buffers shall be maintained in place through the month of August and work within the buffer can commence September 1st.

4.3-7 Impacts to nesting special-status bird species and nesting common bird species. Based on the analysis below and with implementation of mitigation, the impact would be *less than significant.*

California Fish and Game Code (Sections 3503, 3503.5), and the Federal Migratory Bird Treaty Act protect special-status birds including the loggerhead shrike and tricolored blackbird as well as other passerine birds, also known as perching birds, and their nests. Special-status birds and could potentially inhabit the area; therefore, construction of the proposed project could have a ***potentially significant*** impact to special status bird species and nesting common bird species.

Mitigation Measure(s)

The following mitigation measures would reduce the above impact to a *less-than-significant level.*

4.3-7 *If project site disturbance associated with the proposed project would commence between March 1st and September 1st, a preconstruction nesting survey shall be completed in the 14 day period prior to commencing with any proposed project related disturbance on the project site. The nesting survey shall be conducted on the project site and within a zone of influence around the project site. The zone of influence includes those areas off the project site where birds could be disturbed by earth-moving vibrations or noise. Accordingly, the nesting survey(s) must cover the project site and an area around the project site boundary.*

If special-status birds are identified nesting on or adjacent to the project site, a non-disturbance buffer of 100 feet shall be established or as otherwise prescribed by a qualified ornithologist. If common (that is, not special-status) birds for example, California towhee, western scrub jay, or acorn woodpeckers are identified nesting on or adjacent to the project site, a non-disturbance buffer of 75 feet shall be established or as otherwise prescribed by a qualified ornithologist. The buffer shall be demarcated with painted orange lath or via the installation of orange construction fencing. Disturbance within the buffer shall be postponed until it is determined by a qualified ornithologist that the young have fledged and have attained sufficient flight skills to leave the area or that the nesting cycle has otherwise completed.

Typically, most passerine birds in the region of the project site are expected to complete nesting by August 1st. However, many species can complete nesting by the end of June or early to mid-July. Regardless, nesting buffers shall be maintained until September 1st unless a qualified ornithologist determines that young have fledged and are independent of their nests at an earlier date. If buffers are removed prior to September 1st, the qualified biologist conducting the nesting surveys shall prepare and submit a report to the City of Antioch that provides details about the

nesting outcome and the removal of buffers. This report shall be submitted prior to the time that nest protection buffers are removed if the date is before September 1st.

4.3-8 Impacts to the San Joaquin kit fox. Based on the analysis below and with implementation of mitigation, the impact would be *less than significant*.

The San Joaquin kit fox is considered a Federally Endangered species and a California Threatened species. M&A determined that evidence of the kit fox does not exist on-site, nor were burrows or dens detected during surveys. The closest CNDDB record for the San Joaquin kit fox to the project site is a 1995 observation that was located 3.5 miles to the northwest in Contra Loma Regional Park; however, independently conducted surveys were unable to document presence of San Joaquin kit fox in Contra Costa County. Although the species is thought to be extirpated from Contra Costa County, the project site is located within the agency-recognized migration corridor for kit fox species. Any potential impacts would be to migration habitat only. Therefore, impacts related to the San Joaquin kit fox as a result of the proposed project are deemed ***potentially significant***.

Mitigation Measure(s)
Implementation of the following mitigation measure(s) would reduce impacts to the San Joaquin kit fox to a *less-than-significant* level.

4.3-8(a) *To compensate for the permanent loss of 141.6 acres of potential San Joaquin kit fox migration habitat, albeit farmed land, the proposed project includes the permanent preservation and protection of the Marsh Creek Property. An alternative mitigation property approved by the United States Fish and Wildlife Service that possesses comparable biological resources may also be used for mitigation in lieu of the Marsh Creek Property. The Marsh Creek Property is 272 acres that will be managed to benefit San Joaquin kit fox and that provides suitable mitigation for the loss of 141.6 acres of farmland that otherwise provides marginal San Joaquin kit fox migration habitat. In addition, there is a 1991 occurrence for San Joaquin kit fox that was recorded approximately 0.50 mile to the east of the Marsh Creek Property (CNDDB Record No. 573), and there are 9 additional reported occurrences of San Joaquin kit fox within 5 miles of the property. Thus, the Marsh Creek Property has moderate value to the San Joaquin kit fox, as compared to the project site, an agricultural property that has marginal value to the kit fox as migration habitat.*

The East Contra County Conservancy in concert with the Service and the Department, in the East Contra Costa county HCP indicate that the Marsh Creek Property is located in an area deemed to have high value for preservation. In the HCP, the property is mapped within an area designated as within the "Medium Level of Acquisition Effort" category in "Suitable Core Habitat" for the San Joaquin kit fox. The mitigation property is also mapped in the HCP as a "Potential Kit Fox Movement

Route" indicating that the property has value to the San Joaquin kit fox. The geographic location of the property adjacent to EBRPD Round Valley Regional Park further makes it a valuable mitigation property with significant regional importance as a preservation property.

4.3-8(b) The following measures shall be implemented by a qualified biologist:

- *An education program shall be conducted by a qualified biologist prior to the start of construction to explain the endangered species concerns to contractors working at the project site. The program shall include an explanation of the FESA and CESA and any endangered species concerns in the area.*
- *Qualified biologists would conduct preconstruction den surveys no more than 14 days prior to site grading to ensure that potential kit fox dens are not disrupted. If "potential dens" are located, infrared camera stations shall be set up and maintained for 3 consecutive nights at den openings prior to initiation of grading activities to determine the status of the potential dens. If no kit fox is found to be using the den, site grading can proceed unhindered. However, if a kit fox is found using a den site within the project site the Service and the Department shall be notified and consulted before work activities resume.*
- *To prevent harm to San Joaquin kit fox, any steep-walled holes and/or trenches excavated on the project site shall be completely covered at the end of each workday, or escape ramps shall be provided to allow any entrapped animals to escape unharmed. All pipe sections stored at the project site overnight that are four inches in diameter or greater shall be inspected for San Joaquin kit fox before the pipes are moved or buried. If San Joaquin kit fox are identified in the work area at any time, the Service and/or the Department shall be notified and consulted before work activities resume. All trash items shall be removed from the site to reduce the potential for attracting predators of San Joaquin kit fox. Contractors shall be prohibited from bringing firearms and pets to the job site.*

4.3-9 Impacts to Waters of the United States and/or State. Based on the analysis below and with implementation of mitigation, the impact would be *less than significant*.

The proposed project will result in impacts to areas that are within the USACE's and Regional Water Quality Control Board's jurisdiction pursuant to Sections 404 and 401 of the Clean Water Act, respectively. Areas subject to potential jurisdiction by these two agencies include Sand Creek, and an "other waters" roadside ditch and other isolated features along the shoulder of Heidorn Ranch Road. The proposed project will result in permanent impacts to 0.028 acre of waters of the U.S. and a total of 0.11 acre of "isolated

other waters" that would be regulated as "waters of the State." (see Figure 4.3-1). Therefore, the project site results a ***potentially significant*** impact to waters of the United States and/or State.

Mitigation Measure(s)

The following mitigation measures would reduce the above impact to a *less-than-significant* level.

4.3-9 *The applicant is proposing to mitigate for project-related impacts to 0.027 acre of waters of U.S. and a total of 0.11 acre of "waters of the State" via the purchase of 0.20-acre seasonal wetland credits from the Cosumnes Mitigation Bank or other Mitigation Bank, or as otherwise required by the USACE and the RWQCB, provided that the mitigation is no less than 1:1 (replacement : impact). The Service Area for the Cosumnes Mitigation Bank covers the project site.*

Alternatively, the applicant may create, preserve, and manage new seasonal wetlands at the Marsh Creek Property (or comparable offsite location) at a 2:1 mitigation ratio (acres created and preserved: acre impacted). A project-specific Wetland Mitigation and Monitoring Plan prepared by a qualified restoration ecologist that includes the following information shall be provided to the City/USACE/RWQCB prior to conducting any activity that would result in the placement of any fill material into a water of the U.S. or water of the state: a description of the impacted water; a map depicting the location of the mitigation site(s) and a description of existing site conditions; a detailed description of the mitigation design that includes: the location of the new seasonal wetlands; proposed construction schedule; a planting/vegetation plan; specific monitoring metrics, and objective performance and success criteria, such as delineation of created area as jurisdictional waters using USACE published methods; contingency measures if the created wetlands do not achieve the specified success criteria; and short-term and long-term management and monitoring methods.

If the wetland mitigation site is a separate mitigation property that is not subject to mitigation measure BIO-1, the applicant shall grant a conservation easement to a qualified entity, as defined by Section 81.5.3 of the California Civil Code, preserving the created seasonal wetland(s) in perpetuity, and establish an endowment fund to provide for the long-term management, maintenance, and monitoring of the created seasonal wetland(s).

Proof of compliance with the mitigation measure shall be submitted to the Community Development Director prior to the issuance of grading permits.

4.3-10 Impacts to Department of Fish and Wildlife Fish and Game Code Section 1602 jurisdictional areas. Based on the analysis below and with implementation of mitigation, the impact would be *less than significant.*

The proposed project would result in impacts to Sand Creek during the construction of a single storm water outfall structure. California Department of Fish and Wildlife (CDFW) regulates activities that divert, obstruct, or alter stream flow, or substantially modify the bed, channel, or bank of a stream which CDFW typically considers to include its riparian vegetation. Any proposed activity in a natural stream channel that would substantially adversely affect an existing fish and/or wildlife resource, would require entering into a Streambed Alteration Agreement (SBAA) with the CDFW prior to commencing with work in the stream. However, prior to authorizing such permits, the CDFW typically reviews an analysis of the expected biological impacts, any proposed mitigation plans that would be implemented to offset biological impacts and engineering and erosion control plans. Any project modifications to Sand Creek would be subject to the Department's jurisdiction pursuant to Section 1602 of the California Fish and Game Code. The applicant would apply for a SBAA with the Department for the proposed outfall structure that would be constructed as part of the proposed project on the northern bank of Sand Creek. Based the information above, the proposed project could result in ***potentially significant*** impacts to Department of Fish and Wildlife Fish and Game Code Section 1602 jurisdictional areas.

Mitigation Measure(s)
Implementation of BMPs and the installation of a wildlife friendly fence and orange construction fencing shall reduce construction related impacts. The following mitigation measures would reduce the above impact to a *less-than-significant* level.

4.3-10(a) *The applicant shall implement appropriate BMPs to prevent construction related impacts that could introduce de minimus fill or other pollutants into Sand Creek. These measures include the installation of wildlife friendly hay wattles and/or silt fence that shall prevent unintended de minimus fill impact to Sand Creek while the stormwater outfall is constructed. In addition, orange silt fencing shall be installed at the top-of-bank of Sand Creek to prevent unintended human and equipment traffic in areas that are not relevant to the construction of the proposed project. Finally, the dripline of all protected trees within the footprint of the proposed project including trees that could be impacted by the construction of the outfall structure in Sand Creek shall be protected via the installation of orange construction fencing.*

4.3-10(b) *The applicant may satisfy this mitigation by providing the City of Antioch with a fully executed copy of a Streambed Alteration Agreement with the Department for the proposed outfall structure that includes these, or other functionally equivalent, BMPs. The implementation of the executed Streambed Alteration Agreement shall become a condition of project approval.*

4.3-11 Impacts to wildlife corridors. Based on the analysis below the impact is *less than significant.*

Wildlife corridors are linear and/or regional habitats that provide connectivity to other natural vegetation communities within a landscape fractured by urbanization and other development. Wildlife corridors have several functions. Firstly, wildlife corridors provide avenues along which wide-ranging animals can travel, migrate, and breed, allowing genetic interchange to occur. Second, populations can move in response to environmental changes and natural disasters. Lastly, individuals can recolonize habitats from which populations have been locally extirpated. All three of these functions can be met if both regional and local wildlife corridors are accessible to wildlife. Regional wildlife corridors provide foraging, breeding, and retreat areas for migrating, dispersing, immigrating, and emigrating wildlife populations. Local wildlife corridors also provide access routes to food, cover, and water resources within restricted habitats.

The proposed project will not interfere with the movement of native wildlife as the majority of the project site is a disked agricultural field that has been consistently disturbed for years. Sand Creek, just south of the project site, provides a valuable wildlife corridor with suitable cover, foraging and water resources, and migration pathways that lead to other natural habitats. Sand Creek provides a local wildlife corridor for common mammals; however, mammals that use the riparian woodland as a wildlife corridor have been discouraged from using the project site for many years as the site is routinely disked. As such, medium and large mammal movements along this creek will remain unaffected by the proposed project. Finally, this dense and diverse riparian woodland provides important avian habitat that is used seasonally by migrants and year-round by resident birds; this function will also remain unaffected as nesting bird surveys will be conducted prior to commencement of construction. The project as currently proposed would not adversely impact wildlife movement corridors.

In addition, while a small portion of Sand Creek will be impacted during the construction of a stormwater outfall into the creek, the value of this wildlife corridor will be unaffected. Furthermore, prior to the commencement of construction, a wildlife exclusion fence will be installed along the southern perimeter of the project site and extend along the eastern and western edges to prevent mammals migrating along Sand Creek from entering the project site. Sand Creek is the only wildlife corridor in proximity to the project site and this function would be unaffected by the proposed development project and will continue to serve its function as a wildlife corridor. Thus, impacts to wildlife corridors as a result of the implementation of the project site, would be ***less-than-significant***.

Mitigation Measure(s)
None required.

4.3-12 Impacts to protected trees under the City of Antioch's Tree Preservation and Regulation Ordinance. Based on the analysis below and with implementation of mitigation, the impact would be *less than significant.*

Construction of the proposed project would result in the loss of seven mature non-native trees and one non-native landmark tree, which are considered "protected" trees under the City's Tree Preservation and Regulation ordinance. The removal of a protected tree without a tree permit from the City of Antioch is considered a significant adverse impact pursuant to CEQA. In addition, the proposed project will remove 26 unprotected trees that are nonetheless large enough to qualify as "established" trees under the City's Tree Preservation and Regulation ordinance. Therefore, impacts related to protected trees under the City's Tree Preservation and Regulation Ordinance, would be deemed ***potentially significant.***

Mitigation Measure(s)
Implementation of the following mitigation measures would reduce impacts to trees to a *less-than-significant* level.

4.3-12(a) *The final site plan shall indicate the location of any protected trees within the development footprint that the City has required to be saved as a condition to project approval. Compliance with the City of Antioch's Tree Preservation and Regulation ordinance shall occur as follows:*

- *There shall be no excavation within the drip line of any protected trees to be saved unless specific plans are submitted to the Department of Community Development that indicate how grading within the drip line is to be carried out within critically harming the tree. Additional arborist's studies must be provided to support the grading proposed.*
- *Prior to the granting of a building permit the Applicant shall post a bond for each protected tree at which grading will occur within the drip line. The bonding schedule will be as listed in Section 9-5.1206 of the Municipal Code. The City will conduct ongoing inspections during the course of the grading to assure adherence to approved plans. Should the protected tree(s) die during the course of property development, the bond shall be forfeited to the city and used for tree replacement. A percentage of the bond will be retained in either case to assure tree survival for up to five years after the issuance of a certificate of occupancy.*
- *Unless specific exceptions are granted prior to the initiation of construction, all construction activity and traffic shall be prohibited from the area within the drip line of a protected tree.*
- *Should a protected tree be damaged during site development, the Applicant shall administer all reasonable methods of treatments as*

approved by the Director of Community Development. The repair of the damage shall be at the expense of the Applicant.

- *Any time after initial approval of a site plan, an applicant's request to remove a protected tree as shown on the approved site plan will require a hearing. A new public hearing will be held on the issue of tree removal and the applicant will be required to re-notice the surrounding property owners.*
- *All future owners of parcels on which trees were required to be maintained (as a condition of approval) shall be responsible for continued maintenance of such trees. Buyers of property with such trees, as well as buyers of all new single-family homes, shall be given disclosure notices of this requirement, and all other responsibility of tree management and/or preservation as required by the Tree Preservation and Regulation Ordinance.*

4.3-12(b) *To compensate for the loss of up to 34 trees, 136 replacement trees equivalent to a 4:1 mitigation ratio (replacement trees: removed trees) shall be planted as alternatively and equally compliant with the City of Antioch's Tree Preservation and Regulation ordinance as follows:*

- *Four 5-gallon potted trees shall be planted for the loss of each "established" or "mature" tree at the Vineyards at Sand Creek Project site. Four 5-gallon potted trees shall be planted for the loss of the one "landmark" tree since the tree is non-native and in poor condition. A 4:1 mitigation ratio (replacement trees: removed trees) is suitable for the loss of the landmark tree at the Vineyards at Sand Creek Project site because the tree is non-native and is in poor health. This landmark tree will decline regardless of treatment.*
- *All of the mitigation trees shall be native trees indigenous to the region. Trees planted as mitigation may be incorporated into the landscape plans.*
- *All planted trees shall be provided with a temporary irrigation system that would be maintained over a minimum three-year establishment period. The irrigation system shall be placed on electric timers so that trees are automatically watered during the dry months of the establishment period. At the end of a suitable establishment period, the irrigation system may be removed.*
- *All of these replacement trees shall be monitored annually for a minimum of three years by a qualified biologist or arborist, and an annual monitoring report shall be submitted to the City of Antioch'sPlanning Department. Maintenance will include measures to minimize predation of planted trees by rodents including, but not limited to, pocket gophers (Thomomys bottae) and/or California ground squirrels (Spermophilus beechyi).*

- *At the end of a three-year monitoring period, at least 75 percent of planted trees should be in good health. If so, yearly monitoring and reporting is complete. If the numbers of planted trees falls below a 75 percent survival rate, additional trees shall be planted to bring the total number of planted trees up to 100 percent of the original number of trees planted, and irrigation, monitoring and reporting to the City shall continue until the survival rate is achieved.*

4.3-13 Impacts to the Habitat Conservation Plan. Based on the analysis below the impact is *less than significant.*

Formed by six entities, the East Contra Costa County Habitat Conservation Plan Association (HCPA) is a Joint Powers Authority consisting of the Cities of Brentwood, Clayton, and Pittsburg, CCWD, EBRPD, and the newly incorporated City of Oakley. East Contra Costa County initially declined to participate, but in 2001 the County joined the HCPA. The City of Antioch also declined to participate at the time the HCPA was formed. Although the HCPA encouraged the City of Antioch to join the HCPA, the City of Antioch did not change its position and did not to participate in developing this Plan; therefore, resulting in ***less-than-significant*** impact to the HCPA.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in combination with other proposed and pending projects in the region. Other proposed and pending projects in the region under the cumulative context would include buildout of the City's General Plan, as well as development of the most recent planned land uses within the vicinity of the project area.

4.2-14 Cumulative loss of biological resources in the City of Antioch and the effects of ongoing urbanization in the region. Based on the analysis below and with implementation of mitigation, the impact is *less than significant.*

As defined in Section 15355 of the State CEQA Guidelines, "cumulative impacts" refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects (CEQA Guidelines 15355). An assessment of cumulative impacts should consider impacts identified as significant, as well as impacts identified as less-than-significant for individual projects that may become significant in a collective sense when considering the co-occurrence of multiple projects.

In compliance with the City of Antioch General Plan, the applicant has prepared a Resource Management Plan to address preservation of habitat areas (see Appendix F). The City of Antioch, like other cities and communities in the region, is experiencing urban growth. The General Plan EIR concluded that impacts to species identified as a candidate, sensitive or special status species, as well as riparian, wetland, or other natural communities would be less-than-significant after implementation of General Plan Policies 10.3.2 and 10.4.2. The proposed project site was included as part of the Antioch General Plan Area. The cumulative biological impact related to the loss of biological resources in the City of Antioch and the effects of urbanization in the region would be ***potentially significant*** because sensitive species and habitats have the potential to occur on the project site.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

4.4-14 Implement Mitigation Measures 4.3-1 through 4.3-12(b).

Endnotes

[1] Monk & Associates. *Biological Resources Analysis: The Vineyards at Sand Creek Antioch, Contra Costa County, California*. March 2015.
[2] Gibson & Skordal, LLC. *Peer Review of the Biological Resources Analysis.* November 2014.
[3] Stewart's Tree Service, Inc. *Tree Survey. Sand Creek Ranch Property.* July 17, 2014.
[4] City of Antioch. *City of Antioch General Plan*. Updated November 24, 2003.
[5] City of Antioch. *Draft General Plan Update Environmental Impact Report*. July 2003.

4.4 CULTURAL RESOURCES

4.4 CULTURAL RESOURCES

4.4.1 INTRODUCTION

The Cultural Resources chapter of the EIR addresses known historic and prehistoric resources in the project vicinity and the potential for unknown resources to exist. Cultural resources can be categorized into prehistoric, historic, or paleontological resources. Prehistoric resources are those sites and artifacts associated with indigenous, non-Euroamerican populations, generally prior to contact with people of European descent. Historic resources include structures, features, artifacts, and sites that date from Euroamerican settlement of the region. Paleontological resources are fossilized remains of non-human organisms. The analysis summarizes the existing setting and describes the potential effects to cultural resources. The analysis will both identify the thresholds of significance of possible impacts associated with the project, and develop mitigation measures that would be necessary to reduce impacts to a less-than-significant level. Information for this chapter was drawn from the *City of Antioch General Plan*[1] and associated EIR,[2] and the *Cultural Resources Assessment* prepared for the project area by Ric Windmiller, Consulting Archaeologist.[3]

4.4.2 EXISTING ENVIRONMENTAL SETTING

The 141.6-acre project site, historically used as agricultural land, is located in Lone Tree Valley on the north side of Sand Creek. The project site is currently vacant and undeveloped with the exception of the 10-acre Aera property which formerly contained a Shell Oil office and maintenance yard for petroleum pipeline operations. The following environmental setting discussion for the project site consists of the prehistoric, historic, and paleontological context for the site, and an overview of any existing prehistoric, historic, or paleontological resources in the project area.

Prehistoric Context

The following section includes the prehistoric and ethnohistoric context of the region and the potential for prehistoric resources to be found on-site.

Regional Prehistoric Setting

Until 1970, most of the archaeological sites investigated in the San Francisco Bay Area consisted of middens and deposits of refuse at village and camp sites dating back 3,000 to 4,000 years. In addition, a dozen or more archaeological sites in the Bay Area have been dated to the period of 5000 to 2000 BCE. The locations of the early settlements, whether in hill country, bay, or ocean shores, are marked by earth or sand deposits with relatively sparse shell. Artifacts from the early period include large projectile points and milling stones.

A new distinctive culture of bayshore and marsh-adapted people appeared after 2000 BCE. By the beginning of the Christian era, numerous villages were established throughout the San Francisco Bay region. The late archaeologist David Fredrickson identified the villages collectively as the "Berkeley Pattern." Some historians contend that the early Bay culture was a relict Hokan population in contact with early Costanoans. The Berkeley Pattern is represented by Utian (Miwok-Costanoan) speaking people who were settling older Hokan territories in the Bay Area and along the central coast of California. People belonging to Utian language groups are thought to have first occupied eastern Contra Costa County around 2500 to 2000 BCE, coincidental with the rise in sea level and the birth of the Delta region.

The Utians expanded westward to San Francisco Bay by around 1900 BCE. By 1500 BCE, ancestral Costanoans had settled at the southern end of San Francisco Bay. By 500 BCE, the Costanoan territory had expanded to include the Santa Clara Valley. Concurrently, ancestral Miwok-speaking groups moved into the North Bay Area. Yukian and possibly Hokan language groups on the Marin coast were displaced by ancestral Miwokans between 1000 and 500 BCE. However, the way in which older populations were displaced by new populations is still poorly understood.

According to historians, the subsequent Augustine Pattern, which began around 300 to 500 AD, did not appear to mark a replacement of Utian populations in the San Francisco Bay region. However, artifacts characteristic of the Augustine Pattern in the northeast Bay Area denoted the southward expansion of Wintuan (ancestral Patwin) peoples into Bay Miwok territory.

In 1987, James Bennyhoff provided an updated overview of middle and late period west Delta and Bay Area prehistory. Based on an analysis of human remains, Bennyhoff contended that two separate populations were represented and that the earliest phase of the Berkeley Pattern was not simply a variant of the Windmiller Pattern. The Windmiller Pattern included early period sites in the Sacramento, Cosumnes, Stockton, and West Delta districts. Lower Berkeley Pattern sites were located around the San Francisco, San Pablo, and Suisun Bays. Bennyhoff further contended that the Meganos Culture, which he identified in 1968, was the result of a "hybrid" Windmiller population intermarrying with people of the Berkeley Pattern. "Meganos" meant "sand mound," referring to the non-midden cemeteries found in the sand mounds on west Delta islands. Bennyhoff asserted that the Meganos Culture rose between 500 and 200 BCE and was centered in the San Joaquin Valley, but expanded into parts of the Bay Area by the late middle period around 300 to 700 AD.

The middle-late transition, from 700 to 900 AD, was a period of disruption across central California. With the southward expansion of Wintuan peoples, who were likely the bearers of the Augustine Pattern, the Meganosans appear to have retreated to the Sacramento Delta. The intruding Patwin, a Wintuan-speaking people, moved deep into the Solano district and forced the resident ancestral Bay Miwok across the West Delta to the south side of Suisun Bay. Ancestral Karkin Costanoans lived on the north side of the San Pablo and Suisun Bays and also moved to the south across Carquines Strait to join other Costanoans from whom they had been physically separated from for 300 years. Between 700 and 900 AD, the Meganos cemeteries in the Alameda and Diablo districts were abandoned.

From 900 to 1100 AD, the Bay Miwok expanded eastward into the west Delta to occupy the Hotchkiss Mound located near the present-day community of Bethel Island. A study of a late period Meganos cemetery in Stockton showed that the Meganos survivors integrated with Valley Yokuts people. By 1100 to 1300 AD, a new settlement pattern was evident for the Stockton district.

The prehistory of California is a complex story of movement, displacement, as well as integration of entire populations. While the broad patterns of the prehistory of California are understood, archaeologists are still discovering who was living where and during which time periods.

Regional Ethnohistoric Setting

Ethnohistorians have learned to use the special knowledge of a group, linguistic insights, and the understanding of cultural phenomena in order to make more in-depth analysis.[4] The following information pertains to the regional ethnohistoric setting.

Dr. John Marsh, who acquired Rancho Los Meganos in 1842, made mention of the Pulpines on the southeastern flanks of Mount Diablo and on islands in the Delta. The Bay Miwok ranged from Mount Diablo northeastward to Antioch and the west Delta. The Northern Valley Yokuts lived, hunted, fished, and gathered in the Central Valley. However, according to Bennyhoff, the territory of the West Delta Julpun tribe of Miwok-speaking people probably extended to lower Marsh Creek. John Marsh found a few returned "Pulpines" neophytes (i.e., religious converts) in 1838. As such, the Antioch region is within the pre-mission period Julpun (Bay Miwok) territory.

Miwok-speaking people organized into tribelets, each of which included a number of lineages. The lineage was an extended kinship group in which descent was reckoned from a known ancestor who lived usually not more than five or six generations back. Lineages were tied to specific settlements and were named for the specific locality.

Miwok people living along the waterways of the west Delta were fishermen, hunters, and gatherers. Some villages may have specialized in fishing while others relied on seasonal rounds of hunting, fishing, and seed gathering. Miwok-speaking people lived in dome-shaped houses covered with tule mats or tule thatch. Semi-subterranean lodges were also constructed. Large semi-subterranean structures were used in the Central Valley as assembly houses and were found mainly in the principle village or center of each tribelet. Other structures in a village included a sweathouse built over a pit two to three feet deep, a menstrual hut, acorn granaries, and shelters over mortars where acorns were pulverized for meal.

In 1797, the Mission Delores was founded. Settlement at the mission led to a renewed interest in the East Bay region. Explorers and missionaries penetrated the San Joaquin-Sacramento Delta in search of neophytes. Much of the territory of Bay Miwok tribelets was cleared of the entire native population by 1824, if not earlier, and many were sent to Mission San Jose. By 1832, the population of Bay Miwok in general had declined by 80 percent due to missionization.

According to Bennyhoff, baptismal dates for Julpun ended in 1827. In addition, Bennyhoff suggested that Julpun territory southeast of the mouth of the San Joaquin River was abandoned by 1827. Few Julpunes who survived secularization of the missions and left the Indian settlements around the missions returned to the native Julpun territory. As a consequence, John Marsh was able to find and use local Indian labor when he settled Rancho los Meganos, which he named "Farm of the Pulpunes" (a variation of "Julpun").

Project Site Setting

The proposed project site would have been in a border area between Bay Miwok and Northern Valley Yokuts-speaking peoples. As noted above, the Antioch region is within the pre-mission period Julpun (Bay Miwok) territory. According to Bennyhoff, the land about six miles north of the project site may have been the original Julpun tribelet center. The Julpun may have moved the tribelet center to an unidentified island on the north bank of the San Joaquin River shortly after intensive mission contact began in 1810.

A records search of the California Historical Resources Information System (CHRIS) was conducted to identify previous cultural resources studies in the project vicinity by the Northwest Information Center (NWIC) at Sonoma State University (SSU). Prehistoric or historic Native American cultural resources were not identified in the project area.

The Native American Heritage Commission (NAHC) responded to a request for a Sacred Lands File Search and list of Native American contacts. The records search failed to indicate the presence of Native American cultural resources in the immediate project area. However, the letter cautioned that the absence of specific site information does not necessarily imply that cultural resources do not exist within the project area.

A list of three Native American contacts was included with the NAHC report. All three contacts were contacted by mail and e-mail regarding the proposed project and were asked for information on, and concerns regarding, any sites of importance to Native Americans that may be impacted by the proposed project. None of the contacts have responded to date.

Historic Context

The following section includes the historic context of the region and the potential for historic resources to be found on-site.

Regional Setting

While Spanish expeditions through eastern Contra Costa County began in the 1770s, the first non-native settler, John Marsh, did not arrive in California until 1836. Marsh purchased a rancho from the original grantee during the following year. Marsh's rancho, located south of present-day Brentwood, became a mecca for other American immigrants. Some immigrants bought land near Marsh's landing, a boat deck on the San Joaquin River near the west side of present-day Oakley, while others settled to the east. By 1862, the population in the area was large enough to support a

school. Iron House Landing, which included the area's first store, was constructed in 1871 on Dutch Slough.

The growth of agriculture in the area was commensurate with the reclamation of Delta lands, which started in the 1850s. By the early 1870s, reclamation began on marsh land east of Dutch Slough. The reclaimed lands were used to grow orchard and row crops. Antioch to the north became known as the county's "sand belt" because farmers planted largely wheat crops, although barley, oats, and alfalfa were also raised. In 1879, the Tulare and San Pablo Railroad was completed, which provided a new mode of shipping for local farmers.

A.G. Darby was one of the Lone Tree Valley's early settlers. Darby crossed the Plains to California in 1856 to settle in Vaca Valley, Solano County, and then Lone Tree Valley in 1869. In Lone Tree Valley, Darby engaged in general farming of grains, peaches, and almonds. Another settler in Lone Tree Valley, Josiah Wills, moved to Contra Costa County in 1871 using the transcontinental railroad. Wills eventually purchased 320 acres of land for farming and stock-raising north of what is now known as Brentwood.

From 1879 to 1900, the Southern Pacific Railroad was the only line serving eastern Contra Costa County and the San Joaquin Valley. In response to high shipping prices, a group of wealthy businessmen organized the San Francisco and Valley Railroad in 1895. According to historian Donald S. Napoli, property owners in the region were nearly all of European ancestry, with people of Irish and Portuguese descent most common. The first packing houses were built in 1910 and were used to house employed seasonal works. East Indians maintained the dikes and levees in the reclamation tracts to the north.

In the 1920s, the main crops of the region were almonds, asparagus, apricots, peaches, and wine grapes. At the end of the 1920s, the local economy suffered by the onset of the Great Depression. In 1928, levees in the reclaimed land north of Oakley broke and the area was never reclaimed again. Droughts of 1931 and 1934 reduced river flows in the area and allowed more salt in the delta which threatened local farming. As a solution, the Contra Costa Canal was constructed as part of the Central Valley Project, which was as vast new statewide system of dams, reservoirs, and canals. Construction of the Canal began in 1936 and was completed in 1948.

"Davis Camp" was established in the 1930s about a mile south of Oakley on State Route 4. Davis Camp housed migrant farm workers from the South and Midwest. At the camp, workers were allowed to put up shacks or live in cars while working in the fields and packing plants. However, after World War II, the invention of refrigerated trucks which could pick up agricultural produce in the fields eventually made large, centralized packing houses obsolete. New residential construction during the post war years continued slowly but steadily.

Project Site Setting

As noted above, a records search of the CHRIS was conducted to identify previous cultural resources studies in the project vicinity by the NWIC at SSU. One resource is located within the southeast corner of the project site: CA-CCO-682-H/P-7-5, a historic period ranch site. The results of the records search conducted by the NWIC indicate that the project site was previously

subjected to a records search in 1990. The 1990 study encompassed nearly the entire Lone Tree Valley along with hills north and south of the Valley and a small portion of Horse Valley to the south. The study encompassed 2,697 acres.

In 1994, William Self Associates provided a more detailed study of the same nearly 2,700-acre location. In the 1994 study, the historic archaeological site CA-CCO-682-H was described with the following features: a brick and mortar cistern, a brick-lined well, a kidney-shaped depression outlined with mortar and brick, a large pile of wood debris with square nails, various imported trees including walnut, almond, and eucalyptus, and a single piece of white "ironstone" pottery. Foundations were not clearly identified at the site.

In 2006, Basin Research Associates inspected approximately 10 acres in the southeast corner of the proposed project site. The study included the site CA-CCO-682-H and some oral history of the location. According to the study, the site was occupied by the Heidorn family for 15 to 20 years until about 1945. The residence consisted of a two-room wooden shack with a stove. After the family left, the shack was used by the gas plant manager for the local gas fields until 1955 or 1956 when the shack was either burned or demolished. After the shack was destructed, the site was used for equipment storage and, more recently, was used for cultivation and equipment storage. Basin Research Associates concluded that the site was a historic ranching "outpost."

Two bridges on Sand Creek are included in the current CHRIS records search but are located outside of the project site. The first bridge was built in 2007 and the second was built in 1966 and widened and/or extended in 2002. Both are listed as "not eligible for the National Register." In addition, as both bridges are less than 50 years old, neither bridge would be eligible for the California Register of Historical Resources. Furthermore, the Office of Historic Preservation's Directory of Properties in the Historic Property Data File for Contra Costa County, as well as the California Inventory of Historic Resources, did not show listings for the proposed project site. Site CA-CCO-682-H was not listed on either database.

The 1896 United Stated Geological Survey, Mt. Diablo quadrangle, illustrates a north-south road at the location of present-day Heidorn Ranch Road. A road or trail is illustrated connecting with the south end of the Heidorn Ranch Road crossing Sand Creek heading south, and then west. The 1898 Mt. Diablo quadrangle was reprinted in 1905 and illustrates a dwelling on the proposed project site at the north side of Sand Creek, near the curved Heidorn Ranch Road extension that crosses the creek and heads south. The illustrated dwelling is at the present location of CA-CCO-682-H/P-7-5. The current issue of the Mt. Diablo quadrangle illustrates three buildings near the southeast corner of the project site and one building near the center of the site with a connecting road to Heidorn Ranch Road. However, both areas have been completely razed without remaining evidence on the ground surface of precisely where the buildings were located.

Paleontological Context

The geologic map of the Antioch quadrangle identifies the Lone Tree Valley fill as Quaternary alluvium, which overlies the Eocene Markley Sandstone Member of the Kreyenhagen Formation. Markley Sandstone crops out in the hills north and south of the project site. The University of California Museum of Paleontology database search performed on June 25, 2014

by Dr. Kenneth Finger, Consulting Paleontologist, identified 68 Pleistocene localities in Contra Costa County yielding 9,924 vertebrate specimens. All but one of the specimens represent the late Pleistocene Rancholabrean Land Mammal Stage (24,000 to 11,000 years before present), the exception being the middle to late Pleistocene fish cranium. The database did not list significant paleontological localities yet discovered in the Markley Sandstone of Contra Costa County.

4.4.3 REGULATORY CONTEXT

Many agencies have developed laws and regulations designed to protect significant cultural resources. The following discussion contains a summary review of regulatory controls pertaining to cultural resources, including federal, State, and local laws and ordinances.

Federal Regulations

The following are the federal environmental laws and policies relevant to cultural resources.

Section 106 for the National Historic Preservation Act of 1966 (NHPA)

Federal regulations for cultural resources are governed primarily by Section 106 of the NHPA of 1966. Section 106 of NHPA requires Federal agencies to take into account the effects of their undertakings on historic properties and affords the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The Council's implementing regulations, "Protection of Historic Properties," are found in 36 Code of Federal Regulations (CFR) Part 800. The goal of the Section 106 review process is to offer a measure of protection to sites, which are determined eligible for listing on the National Register of Historic Places (NRHP). The criteria for determining NRHP eligibility are found in 36 CFR Part 60. Amendments to the Act (1986 and 1992) and subsequent revisions to the implementing regulations have, among other things, strengthened the provisions for Native American consultation and participation in the Section 106 review process. While federal agencies must follow federal regulations, most projects by private developers and landowners do not require this level of compliance. Federal regulations only come into play in the private sector if a project requires a federal permit or if it uses federal funding.

Paleontological Resources

Paleontological resources are classified as non-renewable scientific resources and are protected by several federal and state statutes, most notably by the 1906 Federal Antiquities Act (PL 59-209; 16 U.S.C. 431 et seq.; 34 Stat. 225), which calls for protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federal lands. Because the proposed project does not include any federal lands, this statute does not apply.

State Regulations

The following are the State environmental laws and policies relevant to cultural resources.

California Environmental Quality Act

State historic preservation regulations affecting this project include the statutes and guidelines contained in CEQA (Public Resources Code sections 21083.2 and 21084.1 and sections 15064.5 and 15126.4 (b) of the CEQA Guidelines). CEQA requires lead agencies to consider the potential effects of a project on historic resources and unique archaeological resources. A "historic resource" includes, but is not limited to, any object, building, structure, site, area, place, record or manuscript that is historically or archaeologically significant (Public Resources Code section 5020.1). Under Section 15064.5 of the CEQA Guidelines, a resource is considered "historically significant" if it meets one or more of the following California Register of Historic Resources criteria:

- The resource is associated with events that have made a significant contribution to the broad patterns of California history;
- The resource is associated with the lives of important persons from our past;
- The resource embodies the distinctive characteristics of a type, period, region or method of construction, or represents the work of an important creative individual or possesses high artistic values; or
- The resource has yielded, or may be likely to yield, important information in prehistory or history.

CEQA requires preparation of an EIR if a proposed project would cause a "substantial adverse change" in the significance of a historical resource. A "substantial adverse change" would occur if a proposed project would result in physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired (CEQA Guidelines Section 15064.5(b) (1)).

In addition to historically significant resources, which can include archeological resources that meet the criteria listed above, CEQA also requires consideration of "unique archaeological resources." If a site meets the definition of a unique archaeological resource, the site must be treated in accordance with the provisions of Public Resources Code section 21083.2. Under Public Resources Code section 20183.2(g), an archaeological resource is considered "unique" if it:

1) Is associated with an event or person of recognized significance in California or American history or recognized scientific importance in prehistory;
2) Can provide information that is of demonstrable public interest and is useful in addressing scientifically consequential and reasonable research questions;
3) Has a special kind or particular quality such as oldest, best example, largest, or last surviving example of its kind;
4) Is at least 100 years old and possesses substantial stratigraphic integrity; or
5) Involves important research questions that can be answered only with archaeological methods.

CEQA also includes specific guidance regarding the accidental discovery of human remains. Specifically, CEQA Guidelines Section 15064.5(e) requires that if human remains are

uncovered, excavation activities must be stopped and that the county coroner be contacted. If the county coroner determines that the remains are Native American, the coroner must contact the NAHC within 24 hours. The NAHC identifies the most likely descendent, and that individual or individuals can make recommendations for treatment of the human remains under the procedures set forth in Section 15064.5 of the CEQA Guidelines.

Tribal Consultation Guidelines (Senate Bill (SB) 18)

SB 18, signed September 2004, requires local (city and county) governments to consult with California Native American tribes, when amending or adopting a general plan or specific plan, or designating land as open space, in order to aid in the protection of traditional tribal cultural places ("cultural places"). The intent of SB 18 is to provide California Native American tribes an opportunity to participate in local land use decisions at an early planning stage, for the purpose of protecting, or mitigating impacts to, cultural places. The consultation and notice requirements apply to adoption and amendment of both general plans (defined in Government Code §65300 et seq.) and specific plans (defined in Government Code §65450 et seq.). The City has carried out SB 18 consultation for the Vineyards at Sand Creek Project.

Assembly Bill 52

Assembly Bill (AB) 52 adds tribal cultural resources to the categories of cultural resources in CEQA, which had formerly been limited to historic, archaeological, and paleontological resources. "Tribal cultural resources" are defined as either:

(1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
    (A) Included or determined to be eligible for inclusion in the California Register of Historical Resources.
    (B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.
(2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1.[5] In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

As stated in Section 11 of AB 52, this act shall apply only to a project that has a notice of preparation or a notice of negative declaration or mitigated negative declaration filed on or after July 1, 2015. The Notice of Preparation (NOP) for the Vineyards at Sand Creek EIR was filed with the State Clearinghouse on September 9, 2014. Therefore, the Vineyards at Sand Creek Project is not subject to AB 52. Notwithstanding this, the City of Antioch, as discussed above, did consult with Native American tribes pursuant to SB 18 requirements. To date, none of the tribes have responded.

In addition, on July 23, 2014, the NAHC responded to a Sacred Lands File search request, indicating that their search of the Sacred Lands File failed to indicate the presence of Native

American cultural resources in the immediate project area, with the caveat that the absence of specific site information in the Sacred Lands File does not indicate the absence of cultural resources in any project area.

Local Regulations

The following are the local government's environmental policies relevant to cultural resources.

Antioch General Plan

The Antioch General Plan objectives and policies relating to the protection of cultural and historical resources that are applicable to the proposed project are presented below.

Objective 10.9.1 Preserve archaeological, paleontological, and historic resources within the Antioch Planning Area for the benefit and education of future residents.

Policy 10.9.2.a Require new development to analyze, and therefore avoid or mitigate impacts to archaeological, paleontological, and historic resources. Require surveys for projects having the potential to impact archaeological, paleontological, or historic resources. If significant resources are found to be present, provide mitigation in accordance with applicable CEQA guidelines and provisions of the California Public Resources Code.

Policy 10.9.2.b If avoidance and/or preservation in the location of any potentially significant cultural resources is not possible, the following measures shall be initiated for each impacted site:

- A participant-observer from the appropriate Indian Band or Tribe shall be used during archaeological testing or excavation in the project site.
- Prior to issuance of a grading permit for the project, the project proponent shall develop a test-level research design detailing how the cultural resource investigation shall be executed and providing specific research questions that shall be addressed through the excavation program. In particular, the testing program shall characterize the site constituents, horizontal and vertical extent, and, if possible, period of use. The testing program shall also address the California Register and National Register

eligibility of the cultural resource and make recommendations as to the suitability of the resource for listing on either Register. The research design shall be submitted to the City of Antioch for review and comment. For sites determined, through the Testing Program, to be ineligible for listing on either the California or National Register, execution of the Testing Program will suffice as mitigation of project impacts to this resource.

- After approval of the research design and prior to the issuance of a grading permit, the project proponent shall complete the excavation program as specified in the research design. The results of this excavation program shall be presented in a technical report that follows the City's outline for Archaeological Testing. The Test Level Report shall be submitted to the City for review and comment. If cultural resources that would be affected by the project are found ineligible for listing on the California or National Register, test-level investigations will have depleted the scientific value of the sites and the project can proceed.
- If the resource is identified as being potentially eligible for either the California or National Register, and project designs cannot be altered to avoid impacting the site, a Treatment Program to mitigate project effects shall be initiated. A Treatment Plan detailing the objectives of the Treatment Program shall be developed. The Treatment Plan shall contain specific, testable hypotheses relative to the sites under study and shall attempt to address the potential of the sites to address these research questions. The Treatment Plan shall be submitted to the City for review and comment.
- After approval of the Treatment Plan, the Treatment Program for affected, eligible sites shall be initiated. Typically, a Treatment Program involves excavation of a statistically representative sample of the site to preserve those resource values that qualify the site as being eligible for the California or National Register. At the conclusion of the excavation or research program, a Treatment Report shall be

developed. This data recovery report shall be submitted to the City for review and comment.

Policy 10.9.2.c When existing information indicates that a site proposed for development may contain paleontological resources, a paleontologist shall monitor site grading activities with the authority to halt grading to collect uncovered paleontological resources, curate any resources collected with an appropriate reposition, and file a report with the Community Development Department documenting any paleontological resources found during site grading.

Policy 10.9.2.d As a standard condition of approval for new development projects, require that if unanticipated cultural or paleontological resources are encountered during grading, alteration of earth materials in the vicinity of the find be halted until a qualified expert has evaluated the find and recorded identified cultural resources.

Policy 10.9.2.e Preserve historic structures and ensure that alterations to historic buildings and their immediate settings are compatible with the character of the structure and the surrounding neighborhood.

4.4.4 IMPACTS AND MITIGATION MEASURES

This section describes the standards of significance and methodology utilized to analyze and determine the proposed project's potential impacts related to cultural resources.

Standards of Significance

Consistent with Appendix G of the CEQA Guidelines and the City's General Plan, a significant impact would occur if the proposed project would result in the following:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5;
- Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5;
- Directly or indirectly destroy a unique paleontological resource on site or unique geologic features; or
- Disturb any human remains, including those interred outside of formal cemeteries.

Method of Analysis

The following previous studies were utilized for the proposed project area: a field survey conducted in 1994 for the 2,700 acre Sand Creek Focus Area of the General Plan (which included the project site but did not include the steep hillside areas); a field survey conducted in 2004 at the corner of Heidorn Ranch Road and Sand Creek Road; and a supplemental cultural resources inventory conducted in 2006 for the PG&E substation south of the project site, an access road corridor that crosses the southeast corner of the project site, the temporary bridges crossing Sand Creek at the southeast corner of the project site, and the boundaries of CA-CCO-682-H. Furthermore, the consulting archeologist, Ric Windmiller, conducted a supplemental field survey of the entire 141.6-acre project site, including the 10-acre Aera property, on July 18, 2014. Almost the entire area had been freshly disked. As a result, ground visibility was 100 percent. The exceptions were the 10-acre Aera location and that portion of the historic archaeological site, CA-CCO-682-H, located adjacent to the steep north bank of Sand Creek. Additional archaeological sites were not identified.

The CHRIS records search and Native American consultation performed by Ric Windmiller has already been discussed in this chapter.

Project-Specific Impacts and Mitigation Measures

The following discussion of impacts to cultural resources is based on the implementation of the proposed project in comparison to existing conditions and the standards of significance presented above.

4.4-1 Historic cultural resources. Based on the analysis below, the impact is *less than significant.*

A CHRIS records search of the archives at the NWIC at SSU determined that one archaeological resource is located within the southeast corner of the project site: CA-CCO-682-H/P-7-5, a historic period ranch site. Prehistoric or historic Native American cultural resources were not identified in the project area. Under Section 15064.5 of the CEQA Guidelines, a resource is considered "historically significant" if the resource meets one or more of the California Register of Historic Resources criteria outlined in the Regulatory Context section.

For eligibility under Criterion 1, the ranch site must be associated with one or more event or historic theme of importance. The ranch site is related to local agriculture and, later, to local gas field maintenance. However, mere association is not sufficient for eligibility under Criterion 1. Although the ranch site is associated with a sequence of occupants and uses, none of the uses appear to be associated with the historic context in an important way. For example, the surrounding lands were originally deeded to the railroad and later sold. Although the ranch site housed a farming family and a gas field employee, neither would be considered important in local history. In addition, the eucalyptus trees and surrounding landscape were most likely planted

after the eucalyptus boom of 1905 to 1912 and, therefore, do not constitute significance.

Under Criterion 2, eligibility for the California Register of Historic Resources would apply only to cultural resources associated with individuals whose specific contributions to history can be identified and documented as significant in our past. The importance of the individual and the length and nature of his or her association with the site and with other sites must be determined. None of the aforementioned associations could be established for the ranch site.

Under Criterion 3, the site can be eligible for the California Register of Historic Resources if the site illustrates important concepts in design and planning, or if the landscape reflects an important historical trend or is distinguished in design, layout, and is the result of skilled craftsmanship. The ranch site does not illustrate any of the aforementioned qualities.

To be eligible under Criterion 4, the site must have yielded or have the potential to yield important information. Previous archaeological inspections of the site and the inspection made by the project archaeologist did not locate any significant trash deposits or privy pits. The two aforementioned features would have the best potential for yielding a variety of information on the site's former occupants. However, the nearby, deeply incised Sand Creek may have provided a convenient dump for trash and even for privy deposits washed away during flash flood events. As such, the ranch site is unlikely to be eligible under Criterion 4.

For the aforementioned reasons, the ranch site is not eligible for the California Register of Historical Places, nor does the site qualify as a "unique archaeological resources" in the professional opinion of the archaeological consultant for the proposed project.[6] Therefore, the proposed project would have a ***less-than-significant*** impact related to damaging or destroying historic cultural resources.

Mitigation Measures(s)
None required.

4.4-2 Archaeological resources and human remains. Based on the analysis below and with the implementation of mitigation, the impact would be *less than significant*.

The entire project site has been subject to field surveys performed in 1994, 2004, 2006, and by the project archaeologist, Ric Windmiller, in 2014. Prehistoric archaeological resources were not identified during the cultural resources assessment. Known human cemeteries or burials are not located within the project site and have not been detected through subsurface excavation or field surveys. However, given the known occupation of the area by Native American tribes over the course of time, the possibility for unknown archaeological resources, including human remains, to be unearthed during construction cannot be excluded. Without implementation of mitigation measures to ensure the proper steps are taken in the case of a discovery,

impacts to archaeological resources and/or human remains would be ***potentially significant***.

Mitigation Measures(s)

Implementation of the following mitigation measures would reduce potentially significant impacts related to damaging or destroying previously unknown archeological resource and/or human remains during ground disturbing activities to a *less-than-significant* level by ensuring the proper procedures are followed in the event of resource discovery.

4.4-2(a) *In the event of the accidental discovery or recognition of any human remains, further excavation or disturbance of the find or any nearby area reasonably suspected to overlie adjacent human remains shall not occur until compliance with the provisions of CEQA Guidelines Section 15064.5(e)(1) and (2) has occurred. The Guidelines specify that in the event of the discovery of human remains other than in a dedicated cemetery, no further excavation at the site or any nearby area suspected to contain human remains shall occur until the County Coroner has been notified to determine if an investigation into the cause of death is required. If the coroner determines that the remains are Native American, then, within 24 hours, the Coroner must notify the Native American Heritage Commission, which in turn will notify the most likely descendants who may recommend treatment of the remains and any grave goods. If the Native American Heritage Commission is unable to identify a most likely descendant or most likely descendant fails to make a recommendation within 24 hours after notification by the Native American Heritage Commission, or the landowner or his authorized agent rejects the recommendation by the most likely descendant and mediation by the Native American Heritage Commission fails to provide a measure acceptable to the landowner, then the landowner or his authorized representative shall rebury the human remains and grave goods with appropriate dignity at a location on the property not subject to further disturbances. Should human remains be encountered, a copy of the resulting County Coroner report noting any written consultation with the Native American Heritage Commission shall be submitted as proof of compliance to the City's Community Development Department.*

4.4-2(b) *If any prehistoric or historic artifacts, or other indications of cultural deposits, such as historic privy pits or trash deposits, are found once ground disturbing activities are underway, all work within the vicinity of the find(s) shall cease and the find(s) shall be immediately evaluated by a qualified archaeologist. If the find is determined to be a historical or unique archaeological resource, contingency funding and a time allotment to allow for implementation of avoidance measures or appropriate mitigation shall be made available (CEQA Guidelines Section 15064.5). Work may continue on other parts of the project site while historical or*

unique archaeological resource mitigation takes place (Public Resources Code Sections 21083 and 21087).

4.4-3 Paleontological resources. Based on the analysis below and with the implementation of mitigation, the impact would be *less than significant.*

Although historic aerial photos show the property has been farmed and disked since the 1930's, project-related excavations would likely impact previously undisturbed Quaternary alluvium at or just below the plow zone. Ground disturbing activities, such as grading or trenching, could disturb Markley Sandstone, particularly at the northern perimeter of the project site where the Sandstone could be very shallow. Previously unknown unique paleontological resources from both the Quaternary alluvium and the Markley Sandstone could be impacted. Without implementation of mitigation measures to ensure the proper steps are taken in the case of a discovery, impacts to paleontological resources would be ***potentially significant***.

Mitigation Measures(s)
Implementation of the following mitigation measure would reduce the potentially significant impact related to damaging or destroying previously unknown paleontological resources to a *less-than-significant* level.

4.4-3 The applicant shall retain the services of a professional paleontologist to educate the construction crew that will be conducting grading and excavation at the project site. The education shall consist of an introduction to the geology of the project site and the kinds of fossils that may be encountered, as well as what to do in case of a discovery. Should any vertebrate fossils (e.g., teeth, bones), an unusually large or dense accumulation of intact invertebrates, or well-preserved plant material (e.g., leaves) be unearthed by the construction crew, then ground-disturbing activity shall be diverted to another part of the project site and the paleontologist shall be called on-site to assess the find and, if significant, recover the find in a timely matter. Finds determined significant by the paleontologist shall then be conserved and deposited with a recognized repository, such as the University of California Museum of Paleontology. The alternative mitigation would be to leave the significant finds in place, determine the extent of significant deposit, and avoid further disturbance of the significant deposit. Proof of the construction crew awareness training shall be submitted to the City's Community Development Department in the form of a copy of training materials and the completed training attendance roster.

Cumulative Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in combination with other proposed and pending projects in the region. Other proposed and pending projects in the region under the cumulative context would include buildout of the City's General

Plan, as well as development of the most recent planned land uses within the vicinity of the project area.

4.4-4 Cumulative loss of cultural resources. Based on the analysis below, the project's incremental contribution to a cumulative impact is *less than significant.*

Prehistoric and historic cultural resources are unique and non-renewable resources. Development activities continue to damage and destroy both prehistoric and historic sites and features, in many cases, before the information inherent in the site could be reviewed, recorded, and interpreted. As noted above in Impacts 4.4-1, 4.4-2, and 4.4-3, the potential exists for unknown subsurface archaeological and paleontological cultural resources to be unearthed during site excavation. The proposed project, along with other development in the City of Antioch and the surrounding region, could damage or destroy cultural resources particular to the project area.

It is possible that some of the projects listed in Chapter 5, section 5.3, and other regional development, would adversely affect cultural resources. Thought the implementation of cumulative projects could collectively impact cultural resources in the geographic area, the proposed project's incremental impact when added to other past, present, and reasonably foreseeable future actions would be relatively minor because no known eligible resources would be impacts by the proposed project. Under CEQA, to constitute a significant cumulative impact there must both be a significant impact of the project combined with the impacts of other past, present and reasonably foreseeable project, and the contribution of the project to that combined impact must be cumulatively considerable. Here, because there are no known cultural resources located on the project site, the project's contribution to a combined effect on cultural resources would be ***less than cumulatively considerable***.

Mitigation Measures(s)
None required.

Endnotes

[1] City of Antioch. *City of Antioch General Plan*. Adopted November 24, 2003.
[2] City of Antioch. *City of Antioch General Plan EIR*. July 2003.
[3] Ric Windmiller, Kenneth Finger. *Promenade Cultural Resources Assessment, Antioch, Contra Costa County, California.* September 2014.
[4] American Society for Ethnohistory. *Ethnohistory: Frequently Asked Questions.* Available at: http://www.ethnohistory.org/frequently-asked-questions/. Accessed: October 24, 2014.
[5] Per Government Code Section 5024.1 (c), the criteria are the same as the National Register of Historic Places criteria:
(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
(2) Is associated with the lives of persons important in our past.
(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
(4) Has yielded, or may be likely to yield, information important in prehistory or history.
[6] Ric Windmiller. *Promenade Cultural Resources Assessment, Antioch, Contra Costa County, California.* September 2014, p. 17.

4.5 GEOLOGY, SOILS, AND MINERAL RESOURCES

4.5 GEOLOGY, SOILS, AND MINERAL RESOURCES

4.5.1 INTRODUCTION

The Geology, Soils, and Mineral Resources chapter of this EIR describes the geologic and soil characteristics of the Vineyards at Sand Creek Project (proposed project) site and evaluates the extent to which implementation of the project could expose people and structures to the following geologic and seismic hazards: rupture of a known earthquake fault; strong seismic ground shaking; seismic-related ground failure, including liquefaction; soil erosion; soil stability; and expansive soils. The chapter also addresses mineral resources. Information in this chapter is drawn from the *City of Antioch General Plan* [1] and the associated EIR,[2] the two *Geotechnical Reports* prepared for the project site by ENGEO, Inc. (see Appendix H)[3,4], and peer review (see Appendix I).[5]

4.5.2 EXISTING ENVIRONMENTAL SETTING

The following background setting information focuses on the regional and site geology of the project site and adjacent off-site impact areas.

Regional Geology and Seismicity

The City of Antioch consists of two general topographic areas: the Lowland Area and the Upland Area. The Lowland Area generally corresponds to the esturine and flatland soils, and the Upland Area includes hillside soils.

The Lowland Area includes the generally level terrain and wetlands adjacent to the San Joaquin River and low-lying areas to the south. Elevations in the Lowland Area generally range from near sea level to about 100 feet above mean sea level (amsl) and contain slopes that range from 0 to 15 percent. The Lowland Area of Antioch is underlain by alluvium that is younger than 2 million years old, and consists mainly of unconsolidated floodplain deposits with sand, silt, gravel, and clay irregularly interstratified. The Upland Area comprises moderate to steeply sloping hills, and is generally located south of the Lowland Area. The Upland Area of the City consists primarily of tilted sedimentary rocks that range in age from Upper Cretaceous (65 million years old) to Holocene (11,000 years old).

The City of Antioch is located in Contra Costa County, within the seismically active San Francisco Bay Area region. Eastern Contra Costa County, like the San Francisco Bay Area, is located in one of the most seismically active regions in the United States. Major earthquakes have occurred in close proximity to Antioch, and are expected to occur again.

Historically active faults in Contra Costa County include the Concord-Green Valley, Hayward, Calaveras, and Marsh Creek-Greenville faults. The largest regional fault, the San Andreas Fault,

is located approximately 45 miles west of Antioch. The nearest active fault zone is the Great Valley Segment 6 fault, located about five miles east of the site.

Project Site Geology

The near-surface soils are expected to be highly expansive. Colluvium (Qc) has been mapped along the base of slopes and within hollows and ravines. The typical thickness of the colluvial deposits varied from about 3.5 feet to 14 feet. Colluvial deposits in the site vicinity have low to high plasticity characteristics and may be considered high to very highly expansive when subjected to fluctuations in moisture content. The site alluvium is derived from Sand Creek, which drains from the west to the east across the middle portion of the site. According to borings performed for the Geotechnical Report, the soil consists of silty to sandy clay in the upper five feet interbedded with layers of clayey to silty sand and sandy to clayey silt at depth. With the exception of the disked soil at the surface, the clayey soils are typically very stiff to hard, and the sandy deposits are typically medium dense to dense consistency. Bedrock in the hilly portions of the site consists of Eocene-age Markley Sandstone. Excavation of test pits exposed sandy clays and clayey sands over claystone and siltstone bedrock. The claystone bedrock was moderately strong with thin bedding and moderately weathered. The sandstone bedrock was fine to medium grained, massive and moderately to deeply weathered.

Project Site Seismicity

The California Division of Mines and Geology determined that no active faults are mapped across the project site. In addition, the site is not located within an Alquist-Priolo Earthquake Fault Zone, and surface evidence of faulting was not observed during site reconnaissance.

Expansive Soils

According to the geotechnical report prepared for the proposed project, the near-surface soils are expected to be highly expansive. Expansive soils shrink and swell as a result of moisture changes, which can cause heaving and cracking of slabs-on-grade, pavements, and structures founded on shallow foundations. Building damage due to moisture changes in expansive soils can be reduced by appropriate grading practices and using post-tensioned concrete mat foundations or similarly stiffened foundation systems that which are designed to resist the deflections associated with soil expansion.

Liquefaction Potential

Liquefaction occurs when saturated cohesionless soils are subject to a temporary, but essentially total, loss of strength due to pore pressure buildup under the reversing cyclic shear stresses associated with earthquakes. As a result these soils are temporarily transformed into a liquid state. The geotechnical report prepared for the proposed project determined that the project site is located in a moderate susceptibility zone for liquefaction. Based on similar soils in the surrounding area, it is expected that potentially liquefiable material may exist at the subject site.

Mineral Resources

The most important mineral resources that are currently mined within Contra Costa County include the following: crushed rock near Mount Zion, on the north side of Mount Diablo, in the Concord area; shale in the Port Costa area; and sand and sandstone deposits mined from several locations, but focused in the Byron area in the southeastern area of the County.[6] According to the County's General Plan, mineral resources are not located near the City of Antioch. According to the City of Antioch's General Plan EIR, none of the areas identified in the City's General Plan as available for new development contain known mineral resources that would be of value to the region or residents of the State.[7]

4.5.3 REGULATORY CONTEXT

The following section includes a brief summary of the regulatory context under which soils and geologic hazards are managed at the federal, State, and local levels.

Federal Regulations

The following are the federal environmental laws and policies relevant to geology, soils, and mineral resources.

Federal Earthquake Hazards Reduction Act

Passed by Congress in 1977, the Federal Earthquake Hazards Reduction Act is intended to reduce the risks to life and property from future earthquakes. The Act established the National Earthquake Hazards Reduction Program (NEHRP). The goals of NEHRP are to educate and improve the knowledge base for predicting seismic hazards, improve land use practices and building codes, and to reduce earthquake hazards through improved design and construction techniques.

Uniform Building Code

The Uniform Building Code (UBC) was first published in 1927 by the International Council of Building Officials and is intended to promote public safety and provide standardized requirements for safe construction. The UBC was replaced in 2000 by the new International Building Code (IBC), published by the International Code Council (ICC), which is a merger of the International Council of Building Officials' UBC, Building Officials and Code Administrators International's National Building Code, and the Southern Building Code Congress International's Standard Building Code. The intention of the IBC is to provide more consistent standards for safe construction and eliminate any differences between the three preceding codes. All State building standard codes are based on the federal building codes.

State Regulations

The following are the State environmental laws and policies relevant to geology, soils, and mineral resources.

Alquist-Priolo Earthquake Fault Zoning Act

The 1972 AP Zone Act was passed to prevent the new development of buildings and structures for human occupancy on the surface of active faults. The Act is directed at the hazards of surface fault rupture and does not address other forms of earthquake hazards. The locations of active faults are established into fault zones by the AP Zone Act. Local agencies regulate any new developments within the appropriate zones in their jurisdiction.

The AP Zone Act regulates development near active faults so as to mitigate the hazard of surface fault rupture. The AP Zone Act requires that the State Geologist (Chief of the California Department of Mines and Geology [CDMG]) delineate "special study zones" along known active faults in California. Cities and counties affected by these zones must regulate certain development projects within these zones. The AP Zone Act prohibits the development of structures for human occupancy across the traces of active faults. According to the AP Zone Act, active faults have experienced surface displacement during the last 11,000 years. Potentially active faults are those that show evidence of surface displacement during the last 1.6 million years. A fault may be presumed to be inactive based on satisfactory geologic evidence; however, the evidence necessary to prove inactivity sometimes is difficult to obtain and locally may not exist.

California Building Standards Code

The State of California regulates development within the State through a variety of tools that reduce or mitigate potential hazards from earthquakes or other geologic hazards. The 2010 California Building Standards Code (California Code of Regulations [CCR], Title 24) governs the design and construction of all building occupancies and associated facilities and equipment throughout California. In addition, the California Building Standards Code governs development in potentially seismically active areas and contains provisions to safeguard against major structural failures or loss of life caused by earthquakes or other geologic hazards. The California building standards include building standards in the national building code, building standards adapted from national codes to meet California conditions, and building standards adopted to address particular California concerns.

Seismic Hazards Mapping Act

The California Seismic Hazards Mapping Act of 1990 (California Public Resources Code Section1690-2699.6) addresses non-surface rupture earthquake hazards, including liquefaction, induced landslides, and subsidence. A mapping program is also established by this Act, which identifies areas within California that have the potential to be affected by such non-surface rupture hazards. The Seismic Hazards Mapping Act specifies that the lead agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites and mitigation measures are incorporated into plans to reduce hazards associated with seismicity and unstable soils.

Surface Mining and Reclamation Act

The Surface Mining and Reclamation Act (SMARA) was enacted in 1975 to address the need for a continuing supply of mineral resources, and to prevent or minimize the negative impacts of surface mining to public health, property, and the environment. The SMARA includes a process called "classification-designation." The purpose of this process is to provide local agencies with information about the location, need, and importance of various mineral resources within their jurisdiction, and to ensure this information is used in local land use decisions.

Local Regulations

The following are the local environmental laws and policies relevant to geology, soils, and mineral resources.

Antioch General Plan

The Antioch General Plan establishes the following objectives and policies applicable to geology, soils, and mineral resources.

Objective 11.3.2 Minimize the potential for loss of life, physical injury, property damage, and social disruption resulting from seismic groundshaking and other geologic events.

Policy 11.3.2.a Require geologic soils reports to be prepared for proposed development sites, and incorporate the findings and recommendations of these studies into project development requirements. As determined by the City of Antioch Building Division, a site-specific assessment shall be prepared to ascertain potential ground shaking impacts on new development. The site-specific ground shaking assessment shall incorporate up-to-date data from government sources and may be included as part of any site-specific geotechnical investigation. The site-specific ground shaking assessment shall include specific measures to reduce the significance of potential ground shaking hazards. This site-specific ground shaking assessment shall be prepared by a licensed geologist and shall be submitted to the City of Antioch Building Division for review and approval prior to the issuance of building permits. For purposes of this policy, "development" applies to new structures and existing structures or facilities that undergo expansion, remodeling, renovation, refurbishment or other modification. This policy does not apply to second units or accessory buildings.

Policy 11.3.2.b Provide information and establish incentives for property owners to rehabilitate existing buildings using updated construction techniques to protect against seismic hazards.

Policy 11.3.2.c Encourage the purchase of earthquake insurance by residents and businesses.

Policy 11.3.2.f Work with PG&E, pipelines companies, and industrial uses to implement measures to safeguard the public from seismic hazards associated with high voltage transmission lines, caustic and toxic gas and fuel lines, and flammable storage facilities.

Policy 11.3.2.g Require that engineered slopes be designed to resist seismically-induced failure.

Policy 11.3.2.h Require that parcels overlying both cut and fill areas within a grading operation be over-excavated to mitigate the potential for seismically-induced differential settlement.

Policy 11.3.2.i Limit development in those areas, which, due to adverse geologic conditions, will be hazardous to the overall community and those who will inhabit the area.

Policy 11.3.2.j Require evaluations of potential slope stability for developments proposed within hillside areas, and incorporate the recommendations of these studies into project development requirements.

Policy 11.3.2.k Require specialized soils reports in areas suspected of having problems with potential bearing strength, expansion, settlement, or subsidence, including implementation of the recommendations of these reports into the project development, such that structures designed for human occupancy are not in danger of collapse or significant structural damage with corresponding hazards to human occupants. Where structural damage can be mitigated through structural design, ensure that potential soils hazards do not pose risk of human injury or loss of life in outdoor areas of a development site.

Policy 11.3.2.l Where development is proposed within an identified or potential liquefaction hazard area (as determined by the

City), adequate and appropriate measures such as (but not limited to) designing foundations in a matter that limits the effects of liquefaction, the placement of an engineered fill with low liquefaction potential, and the alternative siting of structures in areas with a lower liquefaction risk, shall be implemented to reduce potential liquefaction hazards. Any such measures shall be submitted to the City of Antioch Building Division for review prior to the approval of the building permits.

Policy 11.3.2.p Construction of structures for human occupancy shall be prohibited within areas found to have a high probability of surface collapse or subsidence, unless foundations are designed that would not be affected by such surface collapse or subsidence, as determined by site-specific investigations and engineered structural design.

4.5.4 Impacts and Mitigation Measures

This section describes the standards of significance and methodology utilized to analyze and determine the proposed project's potential impacts related to geology, soils, and mineral resources. A discussion of the project's impacts, as well as mitigation measures where necessary, is also presented.

Standards of Significance

Impacts related to geology, soils, and mineral resources are considered significant if the proposed project would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
    - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area based on other substantial evidence of a known fault;
    - Strong seismic ground shaking;
    - Seismic-related ground failure, including liquefaction;
    - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- 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;
- Be located on expansive soil, as defined in Table 18-1B of the Uniform Building Code;
- 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; or

- 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.

Method of Analysis

The analysis for the proposed project is based on Geotechnical Reports prepared by ENGEO, Inc, a peer review of the reports, and the *Antioch General Plan* and the associated EIR. ENGEO's geotechnical analysis for the project site is comprised of a number of analytical tasks, including field exploration, review of previous reports prepared for the project site, geological maps, subsurface exploration (drilling and sampling of five borings to depths of 21½-feet to 38½-feet, and four exploratory test pits using a backhoe with a 24-inch-wide bucket), laboratory testing of selected soil samples to determine field classifications, and corrosivity testing of one soil sample.

Project-Specific Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in comparison with the standards of significance identified above.

4.5-1 Risks to people and structures associated with seismic activity, including ground shaking and ground failure, such as liquefaction or landslides. Based on the analysis below and with implementation of mitigation, the impact would be *less than significant.*

The California Division of Mines and Geology identified no active faults within the project site. In addition, the site and adjacent off-site areas are not located within an Alquist-Priolo Earthquake Fault Zone, and surface evidence of faulting was not observed during site reconnaissance. However, an earthquake of moderate to high magnitude generated within the San Francisco Bay Region could cause considerable ground shaking.

According to the *Geotechnical Engineering Report*, the site is mapped by the Association of Bay Area Governments (ABAG) as being in a moderate susceptibility zone for liquefaction. Liquefaction occurs when saturated cohesionless soils are subject to a temporary, but essentially total, loss of strength due to pore pressure buildup under the reversing cyclic shear stresses associated with earthquakes. As a result these soils are temporarily transformed into a liquid state. Buildout of the proposed project and adjacent off-site areas would place buildings and structures on potentially liquefiable soils. Therefore, the project could potentially expose people and structures to substantial adverse effects associated with ground shaking, ground failure, and liquefaction.

Development of the proposed project would also place buildings and structures in the hillside region of the project area, thus exposing them to possible landslides. Therefore, the project site could potentially expose people and structures to substantial adverse effects associated with landslides.

Given the above considerations, seismic activity in the area of the proposed project could expose people or structures to substantial ground rupture, ground shaking, liquefaction; or landslides and therefore, the impact is considered ***potentially significant.***

Mitigation Measure(s)
Implementation of the following mitigation measures would reduce the above impacts to a *less-than-significant* level.

4.5-1 *Prior to final project design, the project applicant shall submit to the City of Antioch Engineering Department, for review and approval, a design-level geotechnical engineering report produced by a California Registered Civil Engineer or Geotechnical Engineer. The design-level report shall include measures to address construction requirements to mitigate, at a minimum, slope stability, liquefiable soils, and ground shaking. Measures to address the aforementioned geological concerns shall include, at a minimum, the following:*

- *The use of post-tensioned concrete mat foundations for liquefaction-induced settlement;*
- *The over-excavation of a minimum of three feet of soil to remove existing structure foundations and non-engineered fill in order to place the soil back on-site as engineered fill; and*
- *Soil borings and/or cone penetration tests within the development areas and laboratory soil testing to provide date for preparation of specific recommendations regarding grading, foundations, and drainage for the proposed construction.*

4.5-2 Risks to people and structures associated with expansive soils. Based on the analysis below and with implementation of mitigation, the impact would be *less than significant.*

Expansive soils are susceptible to shrink and swell resulting from variations in moisture content. Expansive soils and bedrock may cause heaving and cracking of slab-on-grade, pavements, and foundations. Building damage due to moisture changes in expansive soils can be reduced by appropriate grading practices and using post-tensioned concrete mat foundations or similarly stiffened foundation systems that which are designed to resist the deflections associated with soil expansion.

The expansive nature of the native soil and claystone bedrock is of significant geotechnical concern in this region. The clayey soil and claystone materials at the subject area are considered moderately to highly expansive. Conversely, the sandstone bedrock at the site is considered low to non-expansive.

The *Geotechnical Engineering Report* determined the project site consists of expansive near-surface soils. Based on the *Geotechnical Engineering Report*, the expansive near-

surface soils are considered capable of exerting significant expansion pressures upon building foundations and concrete slabs.

The proposed project would place structures and buildings on potentially expansive soils. Therefore, the associated foundations would be exposed to the potentially damaging effects associated with expansive soils, and a ***potentially significant*** impact would result.

Mitigation Measure(s)
Implementation of the following mitigation measures would reduce the above impacts to a *less-than-significant* level.

4.5-2 *Prior to final project design, the project applicant shall submit to the City of Antioch Engineering Department, for review and approval, a design-level geotechnical engineering report produced by a California Registered Civil Engineer or Geotechnical Engineer. The design-level report shall include measures to address construction requirements to mitigate, at a minimum, expansive/unstable soils. Measures to address the aforementioned geological concerns shall include, at a minimum, the following:*

- *The use of post-tensioned concrete mat foundations or similarly stiffened foundations systems which are designed to resist the deflections associated with soil expansion. The foundations are anticipated to be 10 to 12 inches thick;*
- *The over-excavation of a minimum of three feet of soil to remove existing structure foundations and non-engineered fill in order to place the soil back on-site as engineered fill; and*
- *Soil borings and/or cone penetration tests within the development areas and laboratory soil testing to provide date for preparation of specific recommendations regarding grading, foundations, and drainage for the proposed construction.*

All grading and site development plans should be coordinated with the Engineering Geologist and the Geotechnical Engineer to modify plans for the mitigation of known soil and geologic hazards during the planning process. The final 40-scale grading plans for the project site should be reviewed by the Geotechnical Engineer before submittal to the appropriate regulatory agencies in order to develop a corrective grading plan and provide a detailed review.

4.5-3 Risks associated with substantial erosion or loss of topsoil. Based on the analysis below and with implementation of mitigation, the impact would be *less than significant.*

Due to the nature of the silt soil and bedrock, graded slopes may experience severe erosion when grading is halted by heavy rain. Buildout of the proposed project and

adjacent off-site areas would also involve construction-related activities and, during the early stages of construction, topsoil would be exposed due to grading and leveling of the site. However, topsoil exposure would be temporary during site preparation and would cease once development of buildings and structures occurs. Therefore, the construction-related impacts associated with the potential for soil erosion and the loss of topsoil on the project site would be ***potentially significant***.

Mitigation Measure(s)
Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

4.5-3 *Prior to final project design, the project applicant shall submit, for the review and approval by the City Engineer, an erosion control plan that utilizes standard construction practices to limit the erosion effects during construction of the proposed project. Measures shall include, but are not limited to, the following:*

- *Hydro-seeding;*
- *Placement of erosion control measures within drainageways and ahead of drop inlets;*
- *The temporary lining (during construction activities) of drop inlets with "filter fabric" (a specific type of geotextile fabric);*
- *The placement of straw wattles along slope contours;*
- *Directing subcontractors to a single designation "wash-out" location (as opposed to allowing them to wash-out in any location they desire);*
- *The use of siltation fences; and*
- *The use of sediment basins and dust palliatives.*

4.5-4 Loss of availability of a known mineral resource that would be of value to the region and the residents of the State or of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. Based on the analysis below, the project would have *no impact.*

As discussed above, all areas identified in the City's General Plan as available for new development do not contain any known mineral resources. The Contra Costa County General Plan identifies the nearest areas with important mineral resources as being located in the Concord area, in the Port Costa area, and in the Byron area in the southeastern area of the County. Therefore, the proposed project site does not contain any known mineral resources, and development of the project on the site would not result in the loss of availability of any mineral resources. Therefore, ***no impact*** would occur related to such as a result of the proposed project.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

The continuing buildout of developments in the City of Antioch and surrounding areas would be expected to increase the need for surface grading and excavation, and, therefore, increase the potential for impacts related to soil erosion, unforeseen hazards, and exposure of people and property to earthquakes.

4.5-5 Cumulative increase in the potential for geological related impacts and hazards. Based on the analysis below, the impact is *less than significant.*

Development of the proposed project and adjacent off-site impact areas would increase the number of structures that could be subject to the damaging effects of expansive soils, liquefaction, and landslides. Site preparation would also result in temporary and permanent topographic changes that could affect erosion rates or patterns. However, potentially adverse environmental effects associated with geologic or soils constraints, topographic alteration, and erosion, are usually site-specific and generally would not combine with similar effects that could occur with other projects in Antioch and the surrounding region. Furthermore, all projects would be required to comply with the California Building Code, the City of Antioch's General Plan, and other applicable regulations. Consequently, the proposed project would generally not be affected by, nor would it affect, other development approved by the City of Antioch.

As discussed above, all areas identified in the City's General Plan as available for new development do not contain any known mineral resources. Accordingly, cumulative development within the City, similar to the proposed project, would not result in the loss of availability of any mineral resources.

Based on the above, the project's contribution to cumulative impacts related to geology, soils, and mineral resources would be considered ***less than significant***.

Mitigation Measure(s)
None required.

Endnotes

[1] City of Antioch. *City of Antioch General Plan*. Adopted November 24, 2003.
[2] City of Antioch. *City of Antioch General Plan EIR*. July 2003.
[3] ENGEO, Inc. *Geotechnical Report.* January 3, 2002.
[4] ENGEO, Inc. *Preliminary Geotechnical Summary.* May 16, 2014.
[5] Geocon Consultants, Inc. *Promenade – Planned Residential Development, Heidorn Ranch Road, Antioch, California, Geotechnical Peer Review*. August 26, 2014.
[6] Contra Costa County. *Contra Costa County General Plan, Conservation Element* [pg. 8-34]. January 18, 2005.
[7] City of Antioch. *City of Antioch General Plan EIR* [pg. 5-9]. July 2003.

4.6 HAZARDS AND HAZARDOUS MATERIALS

4.6 HAZARDS AND HAZARDOUS MATERIALS

4.6.1 INTRODUCTION

The Hazards and Hazardous Materials chapter of this EIR describes existing and potentially occurring hazards and hazardous materials within the proposed project area. This chapter discusses potential impacts posed by these hazards to the environment, as well as to workers, visitors, and residents within and adjacent to the project area. The Hazards and Hazardous Materials chapter is primarily based on information drawn from the *Phase I Environmental Site Assessment* (ESA) prepared for the project site by ENGEO, Inc. (see Appendix J),[1] the *Phase I ESA Report Peer Review* prepared for the project site by Geocon Consultants, Inc. (see Appendix K),[2] the *City of Antioch General Plan*,[3] and the Antioch General Plan EIR.[4]

4.6.2 EXISTING ENVIRONMENTAL SETTING

The term hazardous substance refers to both hazardous materials and hazardous wastes. A material is defined as hazardous if the material appears on a list of hazardous materials prepared by a federal, State, or local regulatory agency or if the material has characteristics defined as hazardous by such an agency. The California Department of Toxic Substance Control (DTSC) defines hazardous waste, as found in the California Health and Safety Code, Section 25141(b), as follows:

> […] its quantity, concentration, or physical, chemical, or infectious characteristics: (1) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; (2) pose a substantial present or potential hazard to human health or the environment, due to factors including, but not limited to, carcinogenicity, acute toxicity, chronic toxicity, bioaccumulative properties, or persistence in the environment, when improperly treated, stored, transported, or disposed of, or otherwise managed.

Regional Setting

Hazardous materials and hazardous waste pose potential risks to the health, safety, and welfare of residents and workers, if handled inappropriately. The Delta Diablo Sanitation District (DDSD) disposes of hazardous materials within the City of Antioch. The DDSD operates the Delta Household Hazardous Waste Collection Facility (DHHWCF). The DHHWCF collects hazardous substances and pollutants such as used oil and filters, anti-freeze, latex and oil-based paints, household batteries, fluorescent and high intensity lamps, cosmetics, pesticides, pool chemicals, and household cleaners for safe disposal at the facility. All hazardous waste must be discharged at a Class I landfill under the Federal Resource Conservation and Recovery Act (RCRA).

All pollutants cannot be removed by the DDSD treatment process. To ensure that certain pollutants do not enter the Delta, DDSD has established a Pretreatment Program, which consists of public education and regulation of certain businesses and industries. The Pretreatment Department works closely with commercial and industrial users to ensure that hazardous substances such as solvents, pesticides, metals, grease, petroleum, oil, and paints are not discharged into the sewer system.

Pursuant to the Hazardous Waste Control Law, Antioch has adopted by reference Contra Costa County's Hazardous Waste Management Plan.[5] The Plan establishes a comprehensive approach to management of hazardous wastes in the County, including siting criteria for new waste management facilities, educational and enforcement efforts to minimize and control the hazardous waste stream in the County, and policies to maintain a unified database on businesses generating hazardous wastes.

The City of Antioch has a long history of agricultural production. Agricultural activities typically include the storage and periodic application of pesticides, herbicides, and fertilizers, as well as the storage and use of toxic fuels and solvents. The infiltration of the aforementioned substances may leach into local groundwater supplies, presenting an elevated risk of groundwater contamination. In addition, household hazardous materials pose serious health issues for people who improperly use or dispose of these materials. Adverse environmental impacts can occur when household hazardous materials are disposed of in unlined sanitary landfills where the hazardous materials may leach through the soil and contaminate groundwater.

Medical facilities, including clinics, hospitals, professional offices, blood and plasma centers, and medical research facilities generate a wide variety of hazardous substances. Hazardous medical substances may include contaminated medical equipment or supplies, infectious biological matter, prescription medicines, and radioactive materials used in medical procedures. The disposal of medical waste is achieved by on-site autoclaving of red-bagged waste (any medical waste that could possibly transmit a pathogen) and the subsequent transport to a Class III landfill.

Although incidents can happen almost anywhere, certain areas of Antioch are at higher risk for inadvertent release of hazardous materials. Locations near roadways that are frequently used for transporting hazardous materials (e.g., State Route [SR] 4) and locations near industrial facilities that use, store, or dispose of these materials have an increased potential for a release incident, as do locations along the freight railways.

The California DTSC identifies two sites within Antioch where surface and/or sub-surface contamination has occurred due to the release of hazardous materials or wastes. The sites include the GBF/Pittsburg Dumps, located at the intersection of Somersville Road and James Donlon Boulevard, approximately 5.6 miles northwest of the project site, and the former Hickmott Cannery site, located at the intersection of 6th and "A" Streets, approximately 4.8 miles northwest of the project site.

Project Site Conditions

The following agencies were contacted pertaining to possible past development and/or activity at the project site, including the Aera property:

- City of Antioch Building and Planning Departments;
- Contra Costa County Department of Environmental Health;
- Contra Costa County Hazardous Materials Program;
- Contra Costa County Fire Department;
- Contra Costa County Assessor's Office;
- California Regional Water Quality Control Board, Central Valley Region (CVRWQCB); and
- Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR).

Project Site

The majority of the 141.6-acre project site is vacant dry farm land and is currently disked (see Figure 4.6-1). A representative from the Contra Costa County Department of Environmental Health was contacted and determined that the Department does not have records for the project site. The Contra Costa County Fire Department was contacted for records pertaining to the property and did not identify records for the project site. The Contra Costa County Assessor's Office was accessed to confirm addresses and APN's for the parcels within the project site.

Aboveground storage tanks, evidence of existing underground storage tanks, existing wells, pools of potentially hazardous liquid, stained soil or pavement, or other indicators of hazardous substances were not observed on the project site during the site reconnaissance. Recognized Environmental Conditions (RECs), as defined by American Society for Testing and Materials (ASTM) Standard 1527-13, were not identified at the project site. In addition, the project site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.[6] Environmental Data Resources, Inc. (EDR) provided an Environmental Lien Search Report for the project site and the Aera property. The report did not list environmental liens associated with the project site or Aera property.

ENGEO completed three geotechnical borings within the project site to depths between 21.5 to 38.5 feet. Field indicators of potential contamination (i.e. staining, odors, debris fill, etc.) were not noted on the boring logs and groundwater was not encountered.

Abandoned Wells

The project site previously contained three former oil/gas well compounds which are identified as 2-9, 21-9, and 22-9 (see Appendix J, Figure 2). A former oil-water separator and pipeline is located at former on-site oil/gas well 2-9. An abandoned pipeline may exist on the project site below grade associated with the former wells. Whether or not the service pipeline was abandoned in-place below grade or removed is unknown.

Figure 4.6-1
Project Site Map

A former report by the Source Group, Inc. includes a site map where it appears that a four-inch oil pipeline extends from the west-northwest boundary of the Aera property into the project site trending northwest.

The DOGGR website and map database were reviewed to determine if any historic oil and/or gas wells were located within the project site. The three aforementioned wells (2-9, 21-9, and 22-9) were present on the project site and 37 additional wells were mapped within one mile of the site. The Report of Well Abandonment forms for the three onsite oil/gas wells from the DOGGR website indicate that well 21-9 was abandoned in 1981 and wells 2-9 and 22-9 were abandoned in 1991.[7] The wells were originally completed to depths between 4,000 and 5,000 feet.

A report by Groundwater Technology, Inc. indicates that soil sampling was performed at former well 2-9. Two soil borings were utilized to obtain soil data from the well locations. The soil excavation boundaries extended five and 10 feet deep (161 cubic yards). Groundwater Technology, Inc. determined that soil remediation for well 2-9 was not necessary. The CVRWQCB issued a regulatory closure letter dated July 17, 1995 regarding on-site abandoned oil/gas well 2-9, and four off-site oil/gas wells. The CVRWQCB letter indicates that petroleum hydrocarbon impacted soil was excavated to a depth of 10 feet and transported to an unspecified biotreatment facility. Soil analytical data from the well locations were either below laboratory reporting limits or below approved risk assessment cleanup goals. In addition, groundwater samples did not contain detectable levels for the compounds tested. Environmental site assessment data was not referenced for on-site oil/gas wells 21-9 and 22-9.

An approximately two-inch pipe was observed protruding from the ground within the project site south of the former well 22-9; the purpose for the pipe was unclear and the pipe may have been a fence post or part of a pipeline.

Pipeline Easement

A 25-foot wide Calpine easement runs in an east-west direction across the southern portion of the project site in the location of the existing Old Sand Creek Road. An approximately 58-foot wide PG&E pipeline easement with a 36-inch pipeline below ground runs in a north-south direction across the eastern edge of the project site adjacent to Heidorn Ranch Road. A PG&E pump station is located at the southern property boundary of the project site.

Aera Property

The Aera property is currently vacant, idle land that previously contained an office and maintenance yard operated by Shell Oil for petroleum pipeline operations. The Aera property does not appear to have been utilized for farming activities, as the grass is uncut and unplowed.

Environmental site assessment and remedial soil excavation activities occurred at the Aera property between 1997 and 2011. Up to 77,800 cubic yards of excavated contaminated soil were placed in an on-site bio-treatment area. Six groundwater monitoring wells were installed in 2005 that identified “minimal” groundwater impacts. The CVRWQCB was contacted to obtain the site closure documents for the Aera property. A CVRWQCB closure letter for the Aera property

dated February 17, 2011 indicates that the site has a regulatory "no further action" status. The well abandonment procedures in practice were discussed with DOGGR at the approximate time the wells were abandoned within the project site. The on-site groundwater monitoring wells, domestic well, and septic system were reportedly properly abandoned under regulatory permit requirements. The Aera property was identified as a historical REC based on completed environmental assessment and remediation under CVRWQCB regulatory closure status. The abandoned oil/gas wells may require setbacks from planned structures.

An abandoned two-inch-diameter product pipeline is located in the center of the Aera property and an abandoned four-inch-diameter oil pipeline is located along the western boundary of the Aera property. In addition, an approximate two-inch vertical PVC pipe was observed adjacent to an electrical panel at the Aera property.

The Contra Costa County Department of Environmental Health was contacted for records pertaining to the Aera property. The Department has two letters on file from the CVRWQCB for the Aera property (see Appendix J):

- Rationale for Considering No Further Action Required for Former Shell Yard, 3052 Heidorn Ranch Road, Antioch, Contra Costa County, dated December 7, 2010; and
- Conditional No Further Action Determination, Former Shell Yard, 3052 Heidorn Ranch Road, Antioch, Contra Costa County, dated December 13, 2014.

In addition, the records for the Aera property included monitoring well installation and borings permitted in 2005, monitoring well destruction permits filed in 2011, a water well destruction permit filed in 2011, and a septic system demolition permit filed in 2009.

The Contra Costa County Hazardous Materials Program provided records of two incidents on the Aera property. An incident was documented on February 12, 1997 that included a 55-gallon drum of waste oil which was found on the site. The second incident was documented on November 26, 2000 and included abandoned chemicals in Brentwood. The containers were removed by the Brentwood Police Department.

GeoTracker, a website maintained by the State of California, Water Resources Control Board, and EnviroStor, a website maintained by the State of California, Department of Toxic Substances Control, were reviewed for information regarding the project site. The project site is listed on the GeoTracker website for the Aera property remediation.

Calpine Facility

An above-ground Calpine dehydration station servicing a 10-inch Calpine gas line is located at the far southeast corner of the Aera property. The dehydration station is active, will remain active, and is regularly checked by Calpine employees. The above-ground facilities at the station include piping and cabinets with an approximate 80-foot by 20-foot footprint, standing approximately five feet tall. A gas pipeline, operated by PG&E, runs along the length of the eastern property boundary adjacent to Heidorn Ranch Road. An abandoned four-inch diameter

oil pipeline extends into the project site from the Aera property, and Calpine and PG&E natural gas line.

Airports and Private Airstrips

Land uses and development adjacent to airports in Contra Costa County is governed by the *Airport Land Use Compatibility Plan (ALUCP)* prepared by the Contra Costa County Airport Land Use Commission. The ALUCP establishes development criteria, such as allowable building heights and building materials, for subareas measured at specific distances within the areas of influence of Contra Costa County airports. The Buchanan Field Airport and Byron Airport are covered by the ALUCP. The nearest airport to the project site is the Byron Airport, which is located over 10 miles southeast of the project site. The project site is not within the ALUCP area or the area of influence of the nearest airport.[8]

Wildfire Hazards

According to the United States Forest Service's (USFS) Wildland Fire Assessment System, the City of Antioch, including the project site, is within an area designated as moderate for fire danger.[9] According to the California Department of Forestry and Fire Protection (Cal Fire), the project site is located in an incorporated local responsibility area and the area just south of the project site is designated as a moderate fire hazard severity zone.[10]

To prevent fire, the Contra Costa County Fire Protection District (CCCFPD) strongly recommends that wildland access, or access to existing open areas, be planned into all new subdivisions. In addition, the CCCFPD trains industries located in the City to prevent and respond to fires.

4.6.3 REGULATORY CONTEXT

Many agencies regulate hazardous substances. The following discussion contains a summary of the regulatory controls pertaining to hazardous substances, including federal, State, and local laws and ordinances.

Federal Regulations

Federal agencies that regulate hazardous materials include the USEPA, the Occupational Safety and Health Administration (OSHA), the Department of Transportation (DOT), and the National Institute of Health (NIH). The following federal laws and guidelines govern hazardous materials:

- Federal Water Pollution Control Act;
- Clean Air Act;
- Occupational Safety and Health Act;
- Federal Insecticide, Fungicide, and Rodenticide Act;
- Comprehensive Environmental Response, Compensation, and Liability Act;
- Guidelines for Carcinogens and Biohazards;

- Superfund Amendments and Reauthorization Act Title III;
- Resource Conservation and Recovery Act;
- Safe Drinking Water Act; and
- Toxic Substances Control Act.

Prior to August 1992, the principal agency at the federal level regulating the generation, transport and disposal of hazardous waste was the USEPA under the authority of RCRA. As of August 1, 1992, however, the DTSC was authorized to implement the State's hazardous waste management program for the USEPA. The USEPA continues to regulate hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA).

State Regulations

The California EPA (Cal-EPA) and the California SWRCB establish rules governing the use of hazardous materials and the management of hazardous waste. Applicable State laws include the following:

- Public Safety/Fire Regulations/Building Codes;
- Hazardous Waste Control Law;
- Hazardous Substances Information and Training Act;
- Air Toxics Hot Spots and Emissions Inventory Law;
- Underground Storage of Hazardous Substances Act; and
- Porter-Cologne Water Quality Control Act.

Within Cal-EPA, DTSC has primary regulatory responsibility, with delegation of enforcement to local jurisdictions that enter into agreements with the State agency, for the management of hazardous materials and the generation, transport, and disposal of hazardous waste under the authority of the Hazardous Waste Control Law (HWCL).

Local Regulations

The following are the local government's environmental policies relevant to hazards and hazardous materials.

<u>City of Antioch General Plan</u>

The City's General Plan objectives and policies relating to hazards and hazardous materials that are applicable to the proposed project are presented below.

Objective 11.7.1 Minimize the negative impacts associated with the storage, use, generation, transport, and disposal of hazardous materials.

Policy 11.7.2.a Promote the reduction, recycling, and safe disposal of household hazardous wastes through public education and awareness.

Policy 11.7.2.b Implement the provisions of the Contra Costa County Hazardous Waste Management Plan, including, but not limited to, provisions for pretreatment and disposal, storage, handling, and emergency response.

Policy 11.7.2.c Require businesses generating hazardous wastes to pay necessary costs for local implementation of programs specified in the Contra Costa County Hazardous Waste Management Plan, as well as costs associated with emergency response services for a hazardous materials release.

Policy 11.7.2.d Require new and expanding hazardous materials users to reduce the amount of hazardous waste generated.

- Require submittal of a waste minimization plan with any use permit application for a new large facility or expansion of an existing large facility creating additional hazardous wastes.[11]
- Encourage existing large facilities to prepare waste minimization plans.
- Require new large hazardous waste-producing facilities to provide on-site treatment of recycling of wastes generated to the maximum extent feasible. This will minimize the amount of hazardous waste being transferred off-site for treatment or disposal.
- Require all hazardous waste generators to recycle wastes to the maximum extent feasible.

Policy 11.7.2.e Encourage reductions in the amount of hazardous wastes being generated within Antioch through incentives and other methods.

- Provide educational and technical assistance to all hazardous materials users and waste generators to aid in their source reduction efforts (e.g., substitution of less hazardous products and modifications to operating procedures). These services will primarily be provided by through the County.
- Provide public recognition to hazardous materials users and waste generators who meet or exceed source reduction goals.

- Provide penalties for facilities failing to meet minimization objectives, and place funds from these penalties in a revolving account for use in educational and emergency services efforts.

Policy 11.7.2.f Locate hazardous materials facilities in areas reserved for compatible uses.

- Permit large hazardous waste users and processors only in areas designated for "heavy industrial" use. Smaller generators and medical facilities (e.g., service stations) may be sited in other industrial and commercial areas, consistent with applicable General Plan policies and zoning regulations. The compatibility of small facilities will be determined by the types and amounts of hazardous materials involved and the nature of the surrounding area.
- Require use permits for all operations handling hazardous materials to ensure compatibility with the surrounding area.

Policy 11.7.2.g Maintain adequate siting criteria to determine appropriate locations for hazardous material facilities.

- Maintain a "Hazardous Materials" section in the Antioch zoning ordinance to define siting criteria to be used for various types of facilities, requirements for application submittal, and required findings for approval.

Policy 11.7.2.h Locate hazardous materials facilities at a sufficient distance from populated areas to reduce potential health and safety impacts.

- Require risk assessment studies to determine potential health impacts for all proposed hazardous waste processors and large generators as part of permit application submittals.
- Require a 2,000-foot buffer zone around all new hazardous waste processors within which no residences, schools, hospitals, or other immobile populations, existing, proposed, or otherwise, would be located, unless evidence is presented in

the risk assessment study that a larger buffer is needed.

Policy 11.7.2.i Permit hazardous waste processors based on their relative need in conjunction with the "fair share" approach to facilities siting contained in the Contra Costa County Hazardous Waste Management Plan.

- Require a needs assessment as part of use permit applications for a waste processor, demonstrating the proposed facility will serve a need that cannot be better met in any other manner (e.g., source reduction) or at any other location.
- Discourage proposed hazardous waste facilities processing materials similar to those treated or stored at existing facilities within the County, unless the need for the new facility can be adequately demonstrated.

Policy 11.7.2.j Carefully review and require appropriate mitigation for pipelines and other channels for hazardous materials.

Policy 11.7.2.k Ensure adequate provision is made for emergency response to all crises involving hazardous materials.

- Require emergency response plans for all hazardous waste processors and large generators to be submitted as part of use permit applications.
- Require training of employees of all facilities in emergency procedures, and that they be acquainted with the properties and health effects of the hazardous materials involved in the facilities' operations.

Policy 11.7.2.l Promote the safest possible transport of hazardous materials through Antioch.

- Maintain formally designated hazardous material carrier routes to direct hazardous materials away from populated and other sensitive areas.
- Restrict all processors and new large generators to access only along established hazardous material carrier routes.

- Locate hazardous waste processors as near to waste generators as possible, in order to minimize the need for transport.
- Require transportation analyses for all new large generators and processors to determine the effect of each facility on Antioch's transportation system, and assess and provide mitigation for potential safety impacts associated with hazardous materials transported to and from the site.
- Prohibit the parking of vehicles transporting hazardous materials on City streets.
- Require that new pipelines and other channels carrying hazardous materials avoid residential areas and other immobile populations to the greatest extent possible.

Policy 11.7.2.m Require that hazardous materials facilities within Antioch operate in a safe manner.

- As a condition of approval for new hazardous materials facilities, require access for vehicles carrying hazardous materials to be restricted to hazardous materials carrier routes.
- Undertake inspections of hazardous materials facilities as needed (e.g., when an unauthorized discharge into City sewers is made), and assist Contra Costa Health Services in their inspections as requested.
- Require that water, sewer, and emergency services be available consistent with the level of service standards set forth in the Growth Management Element. Work with LAFCO to require that that sites for proposed hazardous materials facilities annex into the City before necessary municipal services are provided.

Policy 11.7.2.n Require appropriate design features be incorporated into each facility's layout to increase safety and minimize potential adverse effects on public health.

- Require the provision of spill containment facilities and monitoring devices in all facilities.
- Ensure that pipelines and other hazardous waste channels are properly designed to minimize

leakage and require aboveground pipelines to be surrounded by spill containment basins.
- Give priority to underground storage of hazardous materials, unless this method is shown to be infeasible.
- Require hazardous materials storage areas to be located as far from existing pipelines and electrical transmission lines as possible.

Policy 11.7.2.o Maintain a high priority on clean up of the GBF landfill, Hickmott Cannery, and other contaminated sites.

- Maintain communication with the Department of Toxic Substances Control, Contra Costa Health Services, and other responsible agencies to complete clean up of the GBF landfill and Hickmott Cannery sites as rapidly and thoroughly as possible.
- Participate in task forces with County and State agencies for remediation of the GBF landfill and Hickmott Cannery sites.

Policy 11.7.2.p Require that new large hazardous materials users and/or processors maintain communication lines within the community by establishing a Communication and Information Panel. Encourage existing large users and processors to form similar panels.

Policy 11.7.2.q Facilitate public awareness of hazardous materials by preparing and distributing in conjunction with Contra Costa Health Services public information regarding uniform symbols used to identify hazardous wastes, Antioch's household hazardous waste collection programs, and hazardous waste source reduction programs.

Policy 11.7.2.r Monitor the progress and success of hazardous materials efforts, and modify these efforts as needed.

Policy 11.7.2.s Maintain data regarding the use and generation of hazardous materials within Antioch and its Planning Area.

Objective 11.8.1 Maintain a level of preparedness to adequately respond to emergency situations to save lives, protect property, and facilitate recovery with minimal disruption.

Policy 11.8.2.a Maintain data regarding the use and generation of hazardous materials within Antioch and its Planning Area.

Policy 11.8.2.b Disseminate disaster preparedness information to local residents and businesses, describing how emergency response will be coordinated, how evacuation, if needed, will proceed, and what residents and businesses can do to prepare for emergency situations. Provide information to the public about:

- Environmental hazards existing in Antioch;
- The costs of doing nothing to mitigate these hazards;
- Why governmental agencies cannot eliminate all hazards;
- What the City does to assist;
- What the City cannot do; and
- What the public can do to protect itself.

Policy 11.8.2.c Maintain an effective and properly equipped emergency operations center, along with trained personnel, for receiving emergency calls, providing initial response and key support to major incidents, meeting the demands of automatic and mutual aid programs, and maintaining emergency incident statistical data.

Policy 11.8.2.d Maintain ongoing emergency response coordination with surrounding jurisdictions.

Policy 11.8.2.e Encourage private businesses and industrial uses to be self-sufficient in an emergency by:

- Maintaining a fire control plan, including on-site fire fighting capability and volunteer response teams to respond to and extinguish small fires; and
- Identifying personnel who are capable and certified in first aid and CPR.

Policy 11.8.2.e Regularly review and clarify emergency evacuation plans for dam failure, fire, and hazardous materials releases.

4.6.4 IMPACTS AND MITIGATION MEASURES

This section describes the standards of significance and methodology utilized to analyze and determine the proposed project's potential impacts related to hazards and hazardous materials. A discussion of the project's impacts, as well as mitigation measures where necessary, is also presented.

Standards of Significance

In accordance with CEQA, the effects of a project are evaluated to determine if they would result in a significant adverse impact on the environment. For the purposes of this EIR, an impact is considered significant if the proposed project would:

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

Method of Analysis

Site conditions and impacts analysis for this chapter are based primarily on the Phase I ESA prepared for the project site, the Phase I ESA Report Peer Review, personal communications with DOGGR, and the City of Antioch General Plan and associated EIR. In addition, the Cal-EPA's Cortese List Data Resources, which represent the non-confidential portions of reasonably obtainable and practically reviewable records retained by federal, State, and local agencies, were

reviewed for potential environmental liability, including the SWRCB Geotracker and the DTSC EnviroStor databases.[12]

The following agencies were contacted pertaining to possible past development and/or activity at the project site:

- City of Antioch Building and Planning Departments;
- Contra Costa County Department of Environmental Health;
- Contra Costa County Hazardous Materials Program;
- Contra Costa County Fire Department;
- Contra Costa County Assessor's Office;
- CVRWQCB; and
- DOGGR.

ENGEO conducted a reconnaissance of the project site on May 6, 2014. The project site was surveyed for hazardous materials storage, superficial staining or discoloration, debris, stressed vegetation, or other conditions that may be indicative of potential sources of soil or groundwater contamination. In addition, the site was checked for evidence of fill/ventilation pipes, ground subsidence, or other evidence of existing or preexisting underground storage tanks. As part of the Phase I ESA Peer Review, Geocon Consultants performed a second site reconnaissance on July 24, 2014. The conditions observed were consistent with those described in the ENGEO Phase I ESA report.

A historical record review was conducted to develop a history of the previous uses or occupancies of the project site and surrounding area. Historical USGS topographic maps were reviewed to determine if discernible changes in topography or improvements pertaining to the project site had been recorded. Aerial photographs ranging in date from 1939 to 2012 were reviewed for information regarding past conditions and land use at the project site and in the immediate vicinity. In addition, an environmental record search of federal, tribal, State, and local databases regarding the project site and nearby properties was conducted.

Project-Specific Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in comparison with the standards of significance identified above.

4.6-1 The routine transport, use, or disposal of hazardous materials, and/or emitting or handling hazardous materials, substances, or waste within one-quarter mile of a school. Based on the analysis below, the impact is *less than significant*.

A significant hazard to the public or the environment could result from the routine transport, use, or disposal of hazardous materials, or through a reasonably foreseeable upset and accidental release of hazardous materials into the environment. Projects that involve the routine transport, use, or disposal of hazardous materials are typically industrial in nature. The proposed project would not be industrial in nature, and would

consist of the construction of a residential development. Residential land uses do not typically involve the routine transport, use, disposal, or generation of substantial amounts of hazardous materials. Construction activities would involve the use of heavy equipment, which would contain fuels and oils, and various other products such as concrete, paints, and adhesives. However, the project contractor would be required to comply with all California Health and Safety Codes and local ordinances regulating the handling, storage, and transportation of hazardous and toxic materials, as overseen by the Cal-EPA and DTSC.

The nearest schools to the project site are Heritage Baptist Academy, located 0.19 miles north of the proposed project site, and Dozier-Libbey Medical High School, located 0.42 miles west of the proposed project site. Although the project site is located within one-quarter mile of Heritage Baptist Academy, the proposed residential development would not involve the routine transport, use, disposal, or generation of substantial amounts of hazardous materials. It should be noted that, due to the size of the project site and the location of the proposed residences, the majority of project-related activities would occur at distances greater than 0.25 miles or further from Heritage Baptist Academy. Because project operations would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, impacts would be considered ***less than significant***.

Mitigation Measure(s)
None required.

4.6-2 An upset or accidental release of hazardous materials into the environment. Based on the analysis below and with the implementation of mitigation, the impact would be *less than significant*.

As discussed above, the proposed project does not involve the routine transport, use, or disposal of hazardous materials, and, thus, would not result in any upset or accidental release of hazardous materials into the environment. Project construction activities will require the implementation of best management practices to eliminate track out of disturbed soil from the site. Known environmental issues or concerns such as leaks, spills, or soil contamination, do not exist for the project site. The project does not involve the routine transport and storage of petroleum products, which could be potentially hazardous. Any transport or storage of potentially hazardous materials is overseen by the Cal-EPA and DTSC.

As noted above, abandoned two-inch and four-inch-diameter pipelines are located on the Aera property. In addition, a 25-foot wide Calpine easement runs in an east-west direction across the southern portion of the project site. Furthermore, an existing PG&E pipeline easement with a 36-inch pipeline below ground runs along the eastern edge of the project site adjacent to Heidorn Ranch Road. It should be noted that the above-ground Calpine dehydration station servicing a 10-inch Calpine gas line, located at the far southeast corner of the Aera property, will remain active as part of the project.

Extreme caution should be used when excavating, drilling, or grading around the pipelines, and the proposed project development must comply with all applicable federal and State standards and regulations associated with development near petroleum pipelines. For example, the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration requires any project involving digging near a pipeline to call before commencement of digging in order to notify companies that may operate underground utilities in the area planned to be excavated.[13] The companies may then dispatch crews to determine and mark the exact location of their utilities such that the utilities may be avoided during excavation. In addition, in accordance with federal and State regulations, a minimum of 12 inches of clearance between petroleum pipelines and other cross-lines that intersect at a 90-degree angle, or a minimum of 24 inches for intersection angles less than 90 degrees, must be maintained.[14]

The DOGGR encourages property owners and local government agencies to follow their Construction Site Review Program where abandoned oil/gas wells exist within planned development areas. The site review process includes guidelines for not constructing inhabited structures directly over abandoned oil/gas wells, provides recommended setbacks and requires implementation of mitigation measures including venting systems.

If the proposed project does not comply with the above development restrictions and regulations associated with developing near petroleum pipelines, a reasonably foreseeable upset or accidental release of hazardous materials into the environment could occur. Therefore, impacts related to the existing petroleum pipelines could be considered ***potentially significant***.

Mitigation Measure(s)
Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

4.6-2(a) *Prior to commencement of grading and construction, the construction contractor, a representative from PG&E, Calpine, and a representative from the City's Engineering Department shall meet on the project site and prepare site-specific safety guidelines for construction in the field to the satisfaction of the City Engineer. The safety guidelines and field-verified location of the pipelines shall be noted on the improvement plans and be included in all construction contracts involving the project site.*

4.6-2(b) *All abandoned oil pipelines within the areas of the project site planned for development shall be removed. Any associated apparent soil contamination (soil staining, odors, debris fill material, etc.) shall be properly evaluated and mitigated where necessary, in accordance with Mitigation Measure 4.6-2(c).*

4.6-2(c) *If indicators of apparent soil contamination (soil staining, odors, debris fill material, etc.) are encountered at the project site, specifically in the vicinity of abandoned oil/gas wells or during removal of abandoned oil*

pipelines, the impacted area should be isolated from surrounding, non-impacted areas. The project environmental professional shall obtain samples of the potentially impacted soil for analysis of the contaminants of concern and comparison with applicable regulatory residential screening levels (i.e., Environmental Screening Levels, California Human Health Screening Levels, Regional Screening Levels, etc.). Where the soil contaminant concentrations exceed the applicable regulatory residential screening levels, the impacted soil shall be excavated and disposed of offsite at a licensed landfill facility to the satisfaction of the Contra Costa Environmental Health Department.

4.6-2(d) *Prior to final map approval, the project applicant shall submit to the City of Antioch Engineering Department, for review and approval, plans which show that inhabited structures will not be located directly over the three on-site abandoned oil/gas wells. The plans shall be completed in compliance with the DOGGR Construction Site Review Program, which includes guidelines and recommendations for setbacks and mitigation measures for venting systems.*

4.6-3 Located on a site included on a list of hazardous materials sites. Based on the analysis below, the project would have *no impact*.

As mentioned above, the proposed project is located in the southeastern portion of the City of Antioch, adjacent to the City of Brentwood limits, over four miles from most of the intensive industrial operation sites in the City. Due to the distance of the project from most industrial uses, the project is not expected to be affected by any such operations. The project site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Therefore, the proposed project would not be located on or affected by a site included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and would not create a significant hazard to the public or the environment. Therefore, the project would not create a significant hazard to the public or the environment, and ***no impact*** would occur.

Mitigation Measure(s)
None required.

4.6-4 Interference with an adopted emergency response plan or emergency evacuation plan. Based on the analysis below, the project would have *no impact*.

The City of Antioch has an adopted disaster-preparedness plan. The disaster-preparedness plan is updated and practiced annually. All City employees are trained as disaster service workers and perform annual disaster preparedness drills.[15] In addition, the proposed project would be required to comply with the City of Antioch General Plan, including policies set forth for adequate police patrol and emergency response. For example, Policy 11.7.2.f requires new developments to incorporate appropriate design features into the layout in order to increase safety and minimize potential adverse effects

on public health. In addition, Policy 11.8.2.e requires that the City review and clarify emergency evacuation plans for dam failure, fire, and hazardous materials releases. As the proposed project site plan, including site design and circulation, would be evaluated by the City prior to project approval as part of the project review process, compliance with applicable City policies, including ensuring adequate emergency access would be ensured. Therefore, the proposed project would not be expected to interfere with emergency response or emergency evacuation, and ***no impact*** would occur.

Mitigation Measure(s)
None required.

4.6-5 Wildland fires. Based on the analysis below, the impact is *less than significant.*

According to the USFS Wildland Fire Assessment System, the City of Antioch, including the project site, is within an area designated as moderate for fire danger. As noted above, the CCCFPD provides fire protection in the City and trains industries located in the City to prevent and respond to fires. In addition, the City's General Plan contains fire protection policies to ensure cooperation with the CCCFD and requires annual assessments of the adequacy of services and facilities serving Antioch. Furthermore, the City's General Plan EIR concluded that impacts related to wildland fire hazards resulting from buildout of the General Plan would be less than significant with implementation of the fire protection policies in the General Plan.

The project site is currently covered in non-native vegetation with an above-ground Calpine dehydration station in the southeast corner of the project site. The project site is adjacent to existing single-family residential uses to the north; Sand Creek; a PG&E facility; and undeveloped farm land to the south. Because the roadways serving the project site are readily accessible by fire protection personnel, and because the site is adjacent to existing residential development, the project does not present a substantial new risk of exposure of people and structures to wildland fires. Therefore, impacts related to wildand fires would be expected to be ***less than significant***.

Mitigation Measure(s)
None required.

4.6-6 Safety hazards associated with an airport or private airstrip. Based on the analysis below, the project would have *no impact.*

The project site is not located within two miles of a public airport or private airstrip. The nearest major airport is the Byron Airport, which is located over 10 miles southeast of the project site. Due to the buffer between the project site and the nearest airport, the project site is not within an area of influence identified for the Byron Airport. Therefore, the project site would not be subject to any safety hazards associated with an airport, and ***no impact*** would occur.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in combination with other proposed and pending projects in the region. Other proposed and pending projects in the region under the cumulative context would include buildout of the City of Antioch General Plan, as well as development of the most recent planned land uses within the vicinity of the project area, including the Aviano residential development.

4.6-7 Cumulative increase in the number of people who could be exposed to potential hazards associated with potentially contaminated soil and groundwater and an increase in the transport, storage, and use of hazardous materials from development of the proposed project in combination with other reasonable foreseeable projects in the region. Based on the analysis below, the impact is *less than significant*.

Impacts associated with hazardous materials are site-specific and generally do not affect, or are not affected by, cumulative development. Cumulative effects could be considered if the project was, for example, part of a larger development in which industrial processes that would use hazardous materials are proposed, which would not be the case with the proposed project. In addition, as discussed above, project-specific impacts were found to be less than significant or less than significant with the implementation of the recommended mitigation measures. Furthermore, any future proposed development projects would be subject to the same environmental review, as well as the same federal, State, and local hazardous materials management requirements as the proposed project, which would minimize potential risks associated with increased hazardous materials use in the community, including potential effects, if any, on the proposed project. Therefore, implementation of the proposed project would have a ***less-than-significant*** contribution to impacts associated with cumulative hazardous materials use.

Mitigation Measure(s)
None required.

Endnotes

[1] ENGEO, Inc. *Phase I Environmental Site Assessment, Ginochio FUA1 Project, Heidorn Ranch Road, Antioch, California*. June 5, 2014.
[2] Geocon Consultants, Inc. *Phase I ESA Report Peer Review, Promenade Project.* August 25, 2014.
[3] City of Antioch. *City of Antioch General Plan*. Updated November 24, 2003.
[4] City of Antioch. *Draft General Plan Update Environmental Impact Report*. July 2003.
[5] California Health and Safety Code. *Section 25100-25249. 1990.* Available at: http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=HSC&division=20.&title=&part=&chapter=6.5.&article=3.5.
[6] California Department of Toxic Substances Control, EnviroStor. Available at: http://www.envirostor.dtsc.ca.gov. Accessed November 2014.
[7] Department of Conservation, Division of Oil, Gas & Geothermal Resources. *DOGGR website, Report of Well Abandonment.* 2013. Available at: http://www.conservation.ca.gov/DOG/Pages/Index.aspx.
[8] Contra Costa County Airport Land Use Commission. *Contra Costa County Airport Land Use Compatibility Plan.* December 13, 2000.
[9] United States Forest Service. *Wildlife Fire Assessment System.* 2014. Available at: http://www.wfas.net/index.php/fire-danger-rating-fire-potential--danger-32/fire-danger-subsets-fire-potential--danger-55.
[10] California Department of Forestry and Fire Protection. *Contra Costa County FHSZ Map.* November 2007.
[11] Large facilities are those routinely generating more than 1,000 kilograms of solid hazardous waste month or 275 gallons of liquid hazardous waste per month.
[12] California Environmental Protection Agency. *Cortese List Data Resources.* February 16, 2012. Available at: http://www.calepa.ca.gov/sitecleanup/corteselist/. Accessed November 2014.
[13] U.S. Department of Transportation, Pipeline & Hazardous Materials Safety Administration. Damage Prevention. Available at: http://primis.phmsa.dot.gov/comm/DamagePrevention.htm. Accessed May 2015.
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[15] City of Antioch website. *Office of Emergency Services / Disaster Preparedness.* 2014. Available at: http://www.ci.antioch.ca.us/CityGov/Police/Oes/.

4.7 HYDROLOGY AND WATER QUALITY

4.7 HYDROLOGY AND WATER QUALITY

4.7.1 INTRODUCTION

The Hydrology and Water Quality chapter of the EIR describes existing drainage and water resources for the project site, and evaluates potential impacts of the Vineyards at Sand Creek Project (proposed project) with respect to flooding, surface water resources, and groundwater resources. Information for the Hydrology and Water Quality chapter was primarily drawn from the *Preliminary Stormwater Control Plan* prepared for the proposed project by Balance Hydrologics, Inc.,[1] a peer review of the plan by RMC Water and Environment,[2] and a letter from Balance Hydrologics, Inc. responding to comments received from RMC Water and Environment per the peer review[3] with the revised *Preliminary Stormwater Control Plan* attached (Appendix L).[4] In addition, information from the *City of Antioch General Plan*[5] and associated EIR[6], and the Water Supply Assessment prepared for the proposed project by West Yost Associates (Appendix M)[7] was utilized. It should be noted that impacts associated with water supply and capacity are addressed in Chapter 4.10, Public Services, Recreation, and Utilities, of this EIR.

4.7.2 EXISTING ENVIRONMENTAL SETTING

The section below describes the existing hydrological features of the project site and the surrounding region, as well as the water quality of the existing resources in and around the project site.

Regional Drainage

The following existing regional drainage discussion is based on information from the City's General Plan and associated EIR.

Regional Waterways and Water Bodies

The principal waterways within the City of Antioch include the San Joaquin River, East Antioch Creek, West Antioch Creek, Markley Creek, Sand Creek, Marsh Creek, and Deer Creek. Parts of the City's naturally occurring floodplains are paved, and stretches of creek channels have been covered by culverts. In addition to naturally occurring creeks, other waterways occur within the City, such as the Contra Costa Canal, owned by the Bureau of Reclamation. The Contra Costa Canal is a channelized potable water conveyance canal. A spillway leads from the Contra Costa Canal and flows north to the San Joaquin River. The East Bay Municipal Utility District Aqueduct is a water transmission facility that runs from the Central Valley to the East Bay region. The lines are located south of State Route (SR) 4 and are aboveground for roughly 350 feet north of Buchanan Road and west of Somersville Road.

The Contra Loma Reservoir, built by the Bureau of Reclamation as part of the Central Valley Water Project and currently managed by the Contra Costa Water District, is supplied by the Contra Costa Canal and provides peak demand and emergency water supplies for the Contra Costa Water District. The Antioch Municipal Reservoir is also a key component of the City's water system, as the reservoir provides a means of equalizing demand and ensuring the reliability of the supply from the Contra Costa Canal. Although not situated on the main stem of the creek, some flood protection is also provided in the West Antioch Creek watershed by the Antioch Municipal Reservoir. Another lake, Lake Alhambra, which is a private recreation lake for the surrounding residential area, is located on East Antioch Creek.

Regional Flooding

Most flooding that occurs within the City of Antioch is a result of heavy rainfall, high tides, and subsequent runoff volumes that cannot be adequately conveyed by the existing storm drainage system and surface water.

According to the City's General Plan EIR, the Bureau of Reclamation Division of Dam Safety conducted a safety analysis of the Contra Loma Reservoir in 1983 and determined that safe performance of the dam can be expected under all anticipated loading conditions, including the MCE (maximum credible earthquake) and PMF (probable maximum flood) events. The overall safety classification of the dam is registered as satisfactory. According to the City's General Plan EIR, in the unlikely event of dam failure, the estimated inundation area would essentially follow the West Antioch Creek drainage from the dam to the San Joaquin River. The inundation area would extend to a half-mile-wide area south of SR 4, and a more than a half-mile-wide area at West 10th Street. The anticipated maximum depth would be 19 feet directly south of the dam to seven feet at West 10th Street and 11 feet at the San Joaquin River.

The City continues to implement flood prevention measures, including construction of detention basins. The most significant detention basins are the Trembath, Oakley, and Lindsay basins on East Antioch Creek and the Sand Creek Basin on Sand Creek. In addition, significant portions of Markley Creek, West Antioch Creek, and East Antioch Creek have been improved to contain the 100-year flood within their channels. A flap gate protects the Lake Alhambra area where the East Antioch Creek enters the San Joaquin River. The gate is adequate in normal tides; however, during high tides, the river overflows the adjacent banks and contributes to flooding potential upstream.

Regional Stormwater System

Stormwater collection in the City is overseen by the Contra Costa County Flood Control and Water Conservation District (CCCFCWCD). The City has over 110 miles of trunk lines to collect stormwater, which are independent from the wastewater collection system. The stormwater trunk lines discharge to channels owned and maintained by both the City of Antioch and the CCCFCWCD. The CCCFCWCD releases stormwater from the channels to the San Joaquin River and is the holder of a National Pollution Discharge Elimination System (NPDES) permit. Contra Costa County Clean Water Program staff monitors the quality of the released

water to comply with the specifications of the NPDES permit. The Central Valley Regional Water Quality Control Board (CVRWQCB) regulates stormwater discharged from the City.

Local Drainage

The proposed project site is located in the southeastern portion of the City of Antioch. The site is currently vacant land that has been used for agricultural purposes for many years. The property is bounded on the north by an existing housing development, on the south by Sand Creek, on the east by Heidorn Ranch Road, and on the west by a future extension of Hillcrest Avenue. Topography on the site is characterized by relatively flat terrain, with the highest elevation in the area at approximately 170 feet above sea level in the northwestern corner of the site and the lowest elevation at approximately 149 feet above sea level in the northeast corner of the site, near Heidorn Ranch Road. The project site exhibits minimal depressional topography. The mean annual precipitation at the site is roughly 13.6 inches. Significant existing impervious areas on the site do not exist, with the exception of Heidorn Ranch Road. As such, precipitation falling on the project site flows to the east and is intercepted by Heidorn Ranch Road, with some of the runoff draining via infiltration.

Sand Creek, an intermittent creek, flows west to east along the southern project site boundary eventually entering Marsh Creek in the City of Brentwood. The creek receives urban runoff from developments to the northwest, and from a larger, yet undeveloped, watershed further to the northwest. The average distance between ordinary high water marks (OHWM) in Sand Creek is 12 feet and the creek is approximately 70- to 150-feet wide between the top-of-banks. Sand Creek is incised approximately 20 feet down below the existing grade of the project site, has steeply-sloped banks, and has a floodplain terrace near the top of the banks on either side of the thalweg.

The project site is primarily underlain by only one major soil group. Roughly 62 percent of the site consists of Capay Clay (CaA) and 37 percent of the site consists of Rincon Clay Loam, with the remaining one percent being Altamont Clay. All three soils are classified as soil group C under the National Resources Conservative Service (NRCS) hydrologic soil group system, with infiltration rates ranging from 0.13 inches per hour (in/hr) for the Capay Clay to 0.85 in/hr for the Rincon Clay Loam. The Group C soils underlying the site generally have low natural percolation rates and can severely limit the potential for direct infiltration of stormwater. As such, the soils currently produce runoff rates that are relatively high. According to the Stormwater Control Plan prepared for the proposed project, under existing conditions, the predicted peak discharge from the site ranges from 37.7 cubic feet per second (cfs) for the 10-year 12-hour storm to 107.5 cfs for the 100-year storm.

Local Flooding

The Federal Emergency Management Agency (FEMA) categorizes flood prone areas based on the frequency of occurrence. The project site is within Flood Insurance Rate Map (FIRM) number 06013C0335F. According to the FIRM, the entirety of the project site is within Flood Hazard Zone X, which is described by FEMA as an area of moderate to low flood risk, usually between the 100-year to 500-year flood levels. Sand Creek, directly south of the project site, is

mapped as Zone A, which is described by FEMA as an area subject to inundation by the one-percent-annual-chance flood event.

Water Quality

Water is essential to recreation, the viability of agriculture, and the development of housing, commerce, and industry, as well as the maintenance of high-quality fish and wildlife habitats. Land uses and activities that the City must consider in protecting the quality of the City's water include construction activities, agricultural land uses, and urban runoff.

Construction Activities

Construction activities have the potential to cause erosion and sedimentation associated with groundbreaking and clearing activities. Such effects could result in impacts to nearby water bodies. Unstabilized soil could be washed or wind-blown into nearby surface water. Due to the use of heavy equipment during construction activities, during rainfall events, petroleum products and other pollutants from construction equipment have the potential to enter nearby drainages.

Agricultural Land Uses

Water running off irrigated agricultural fields may contain fertilizers and pesticides. Improper use and disposal of farm chemicals can contaminate surface and groundwater resources. Agricultural procedures can also result in erosion of unstabilized soil, especially during conversion of vegetation. Aerial spraying could also drift into nearby water bodies.

Urban Runoff

Stormwater runoff from urban areas could contain a variety of pollutants that may reduce the quality of groundwater when introduced into groundwater aquifers or surface water when allowed to flow untreated to water bodies. Pollutants typically found in urban runoff include household and lawn-care chemicals (insecticides, herbicides, fungicides and rodenticides), heavy metals (such as copper, zinc and cadmium), oils and greases, and nutrients (nitrogen and phosphorus).

Groundwater and Groundwater Recharge

The City is located within the Tracy subbasin within the greater San Joaquin Valley Groundwater Subbasin. The City of Antioch receives water supplies from the San Joaquin River and the Sacramento-San Joaquin Delta. According to the Water Supply Assessment prepared for the proposed project, the City does not currently pump groundwater and does not intend to pump groundwater from the local groundwater basin in the future. Policy 10.7.2(d) of the City's General Plan requires protection of groundwater recharge areas, such as protection of stream sides from urban encroachment.

4.7.3 REGULATORY CONTEXT

The following is a description of federal, State, and local environmental laws and policies that are relevant to the review of hydrology and water quality under the California Environmental Quality Act (CEQA) process.

Federal Regulations

The following section includes federal environmental goals and policies relevant to the CEQA review process pertaining to the hydrology and water quality aspects of the proposed project.

Federal Emergency Management Agency (FEMA)

The FEMA is responsible for determining flood elevations and floodplain boundaries based on U.S. Army Corps of Engineers (USACE) studies. FEMA is also responsible for distributing the FIRMS, which are used in the National Flood Insurance Program (NFIP). The FIRMs identify the locations of special flood hazard areas, including the 100-year floodplains.

FEMA allows non-residential development in the floodplain; however, construction activities are restricted within flood hazard areas, depending upon the potential for flooding within each area. Federal regulations governing development in a floodplain are set forth in Title 44, Part 60 of the Code of Federal Regulations (CFR). These standards are implemented at the State level through construction codes and local ordinances; however, these regulations only apply to residential and non-residential structure improvements. Although roadway construction or modification is not explicitly addressed in the FEMA regulations, the California Department of Transportation (Caltrans) has also adopted criteria and standards for roadway drainage systems and projects situated within designated floodplains. Standards that apply to floodplain issues are based on federal regulations (Title 23, Part 650 of the CFR). At the State level, roadway design must comply with drainage standards included in Chapters 800-890 of the Caltrans Highway Design Manual. CFR Section 60.3(c)(10) restricts cumulative development from increasing the water surface elevation of the base flood by more than one foot within the floodplain.

Federal Clean Water Act

The National Pollutant Discharge Elimination System (NPDES) permit system was established in the federal Clean Water Act (CWA) to regulate municipal and industrial discharges to surface waters of the U.S. Each NPDES permit contains limits on allowable concentrations and mass emissions of pollutants contained in the discharge. Sections 401 and 402 of the CWA contain general requirements regarding NPDES permits. Section 307 of the CWA describes the factors that EPA must consider in setting effluent limits for priority pollutants.

Nonpoint sources are diffuse and originate over a wide area rather than from a definable point. Nonpoint pollution often enters receiving water in the form of surface runoff, but is not conveyed by way of pipelines or discrete conveyances. As defined in the federal regulations, such nonpoint sources are generally exempt from federal NPDES permit program requirements. However, two types of nonpoint source discharges are controlled by the NPDES program – nonpoint source

discharge caused by general construction activities, and the general quality of stormwater in municipal stormwater systems. The 1987 amendments to the CWA directed the federal EPA to implement the stormwater program in two phases. Phase I addressed discharges from large (population 250,000 or above) and medium (population 100,000 to 250,000) municipalities and certain industrial activities. Phase II addresses all other discharges defined by EPA that are not included in Phase I.

Section 402 of the CWA mandates that certain types of construction activities comply with the requirements of the National Pollutant Discharge Elimination System (NPDES) stormwater program. The Phase II Rule, issued in 1999, requires that construction activities that disturb land equal to or greater than one acre require permitting under the NPDES program. In California, permitting occurs under the General Permit for Stormwater Discharges Associated with Construction Activity, issued to the State Water Resources Control Board (SWRCB), implemented and enforced by the nine Regional Water Quality Control Boards (RWQCBs).

As of July 1, 2010, all dischargers with projects that include clearing, grading or stockpiling activities expected to disturb one or more acres of soil are required to obtain compliance under the NPDES Construction General Permit Order 2009-0009-DWQ. The General Permit requires all dischargers, where construction activity disturbs one or more acres, to take the following measures:

1. Develop and implement a Storm Water Pollution Prevention Plan (SWPPP) to include a site map(s) of existing and proposed building and roadway footprints, drainage patterns and storm water collection and discharge points, and pre- and post- project topography;
2. Describe types and placement of Best Management Practices (BMPs) in the SWPPP that will be used to protect storm water quality;
3. Provide a visual and chemical (if non-visible pollutants are expected) monitoring program for implementation upon BMP failure; and
4. Provide a sediment monitoring plan if the area discharges directly to a water body listed on the 303(d) list for sediment.

To obtain coverage, a SWPPP must be submitted to the RWQCB electronically and a copy of the SWPPP must be submitted to the City of Antioch. When project construction is completed, the landowner must file a Notice of Termination (NOT).

Construction Site Runoff Management

In accordance with NPDES regulations, in order to minimize the potential effects of construction runoff on receiving water quality, the State requires that any construction activity affecting one (1) acre or more must obtain a General Construction Activity Stormwater Permit. Permit applicants are required to prepare a Stormwater Pollution Prevention Plan (SWPPP) and implement Best Management Practices (BMPs) to reduce construction effects on receiving water quality by implementing erosion and sediment control measures.

State Regulations

The following section includes the State regulations relevant to the CEQA review process pertaining to the hydrology and water quality aspects of the proposed project.

State Water Resources Control Board

The SWRCB and the RWQCBs are responsible for ensuring implementation and compliance with the provisions of the federal CWA and California's Porter-Cologne Water Quality Control Act. Contra Costa County includes areas within the CVRWQCB (Region 5S) and the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) (Region 2) jurisdictional boundaries. The project site is situated within the jurisdictional boundaries of the CVRWQCB. The CVRWQCB has the authority to implement water quality protection standards through the issuance of permits for discharges to waters at locations within their jurisdiction. It should be noted that all areas west of the City of Antioch in Contra Costa County are within the SFBRWQCB jurisdictional area.

The County Watershed Program is responsible for ensuring that the County complies with NPDES permits, which include the Municipal Regional Permit (MRP) (NPDES Permit No. CAS612008) and the East Contra Costa County Municipal Stormwater Permit (EC3MSP) (NPDES Permit No. CAS083313). The MRP was adopted by the SFBRWQCB on October 14, 2009, and applies to 76 Bay Area municipalities and discharges to the San Francisco Bay. The EC3MSP was adopted by the CVRWQCB on September 23, 2010, and applies to the Cities of Antioch, Oakley, Brentwood, unincorporated Contra Costa County and the Contra Costa County Flood Control District and discharges to the Delta. The EC3MSP largely mimics the MRP.

The MRP and EC3MSP contain a comprehensive plan to reduce the discharge of pollutants in stormwater to the maximum extent practicable in order to protect water quality. To accomplish such, a number of provisions are included in the permits, such as Provision C.3, New Development and Redevelopment. Provision C.3 requires new development and redevelopment projects that create and/or replace 10,000 square feet or more of impervious surface over the whole site to include appropriate source control, site design, and stormwater treatment measures to address stormwater runoff pollutant discharges and prevent increases in runoff flows primarily through the implementation of low impact development (LID) techniques. To aid in the design of appropriate stormwater system design consistent with the Provision C.3 requirements, the *Stormwater C.3 Guidebook* was developed.[8]

Local Regulations

The following section includes the local regulations relevant to the CEQA review process pertaining to the hydrology and water quality aspects of the proposed project.

City of Antioch General Plan

The following objectives and policies of the Antioch General Plan are applicable to the hydrology and water quality aspects of the proposed project.

Storm Drainage and Flood Control

Objective 8.7.1 Conduct all storm water via adequately sized storm drains and channels.

Policy 8.7.2.a Continue working with the Contra Costa County Flood Control District to ensure that runoff from new development is adequately handled.

Policy 8.7.2.b Require adequate infrastructure to be in place and operational prior to occupancy of new development, such that:

- New development will not negatively impact the performance of storm drain facilities serving existing developed areas and
- The performance standards set forth in the Growth Management Element will continue to be met.

Policy 8.7.2.c Design flood control within existing creek areas to maximize protection of existing natural settings and habitat.

Policy 8.7.2.d Provide retention basins in recreation areas where feasible to reduce increases in the amount of runoff resulting from new development.

Policy 8.7.2.e Require new developments to provide erosion and sedimentation control measures to maintain the capacity of area storm drains and protect water quality.

Policy 8.7.2.f Require implementation of BMPs in the design of drainage systems to reduce discharge of nonpoint source pollutants originating in streets, parking lots, paved industrial work areas, and open spaces involved with pesticide applications.

Open Space

Objective 10.3.1 Maintain, preserve, and acquire open space and its associated natural resources by providing parks for active and passive recreation, trails, and by preserving natural, scenic, and other open space resources.

Policy 10.3.2.d Where significant natural features are present (e.g., ridgelines, natural creeks), require new development to incorporate natural open space areas into project design.

Require dedication to a public agency or dedication of a conservation easement, preparation of maintenance plans, and provision of appropriate maintenance in perpetuity of such open space areas.

Policy 10.3.2.f Encourage public access to creek corridors through the establishment of trails adjacent to riparian resources.

Water Resources and Quality

Objective 10.7.1 Ensure that adequate supply of water is available to serve existing and future needs of the City.

Policy 10.7.2.a As part of implementing the City's residential growth management program development review process for non-residential development, ensure that adequate long-term water supplies are available to serve the development being granted new allocations, including consideration of peak drought and peak fire fighting needs.

Policy 10.7.2.b Require new development to be equipped with drought-tolerant landscaping and water conservation devices.

Policy 10.7.2.d Protect, where possible, groundwater recharge areas, including protection of stream sides from urban encroachment.

Policy 10.7.2.e Oppose proposals with the potential to increase the salinity of the Delta and/or endanger the City's rights to divert water from the San Joaquin River.

Policy 10.7.2.f Participate in the Contra Costa Clean Water program to reduce stormwater pollution and protect the water quality of the City's waterways.

Policy 10.7.2.g Require public and private development projects to be in compliance with applicable National Pollution Discharge Elimination System (NPDES) permit requirements, and require the implementation of best management practices to minimize erosion and sedimentation resulting from new development.

Policy 10.7.2.i Design drainage within urban areas to avoid runoff from landscaped areas and impervious surfaces from carrying

pesticides, fertilizers, and urban and other contaminants into natural streams.

Flood Protection

Objective 11.4.1 Minimize the potential for loss of life, physical injury, property damage, and social disruption resulting from flooding.

Policy 11.4.2.a Prohibit all development within the 100-year floodplain, unless mitigation measures consistent with the National Flood Insurance Program are provided.

Policy 11.4.2.b Minimize encroachment of development adjacent to the floodways in order to convey flood flows without property damage and risk to public safety. Require such development to be capable of withstanding flooding and to minimize the use of fill.

Policy 11.4.2.c Prohibit alteration of floodways and channelization of natural creeks if alternative methods of flood control are technically and financially feasible. The intent of this policy is to balance the need for protection devices with land use solutions, recreation needs, and habitat preservation.

Policy 11.4.2.d Require new development to prepare drainage studies to assess storm runoff impacts on the local and regional storm drain and flood control system, along with implementation of appropriate detention and drainage facilities to ensure that the community's storm drainage system capacity will be maintained and peak flow limitations will not be exceeded.

Policy 11.4.2.e Where construction of a retention basin is needed to support new development, require the development to provide for the perpetual funding and ongoing maintenance of the basin.

Policy 11.4.2.f Eliminate hazards caused by local flooding through improvements to the area's storm drain system or creek corridors.

Disaster Response

Objective 11.8.1 Maintain a level of preparedness to adequately respond to emergency situations to save lives, protect property, and facilitate recovery with minimal disruption.

Policy 11.8.2.a Maintain and update the City's Emergency Response Plan, as required by State law.

Policy 11.8.2.f Regularly review and clarify emergency evacuation plans for dam failure, fire, and hazardous materials releases.

City of Antioch Code of Ordinances

The following sections of the Antioch Code of Ordinances are applicable to the hydrology and water quality aspects of the proposed project.

Section 8-13.01: Stormwater Control Plan Required

Storm water pollution control measures shall be implemented during all construction phases of development to prevent pollution from entering the waterways.

4.7.4 IMPACTS AND MITIGATION MEASURES

The following section describes the standards of significance and methodology utilized to analyze and determine the proposed project's potential impacts related to hydrology and water quality. A discussion of the project's impacts, as well as mitigation measures where necessary, is also presented.

Standards of Significance

Consistent with Appendix G of the CEQA Guidelines and the City's General Plan, a significant impact would occur if the proposed project would result in any of the following:

- Substantially alter the existing drainage pattern of the site or area;
- 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;
- Violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or flood hazard delineation map, or place within a 100-year floodplain structures which would impede or redirect flood flows; or

- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Inundation by seiche, tsunami, or mudflow.

The proposed project's impacts associated with water supply and capacity are further addressed in Chapter 4.10, Public Services, Recreation, and Utilities of this EIR.

Method of Analysis

Site conditions and impacts analysis for this chapter are based primarily on the *Preliminary Stormwater Control Plan* prepared for the proposed project by Balance Hydrologics, Inc. The *Preliminary Stormwater Control Plan* was prepared in compliance with the *Stormwater C.3 Guidebook* and includes sizing calculations for the proposed on-site integrated management practices (IMPs). In accordance with the *Stormwater C.3 Guidebook*, the *Preliminary Stormwater Control Plan* demonstrates the project's compliance with applicable requirements of Provision C.3 to minimize imperviousness, retain or detain stormwater, slow runoff rates, incorporate required source controls, treat stormwater prior to discharge from the site, control runoff rates and durations, and provide for operation and maintenance of treatment and flow-control facilities. The *Preliminary Stormwater Control Plan* includes analysis of the proposed on-site stormwater management system's adequacy for water quality treatment, flow-duration controls (hydromodification management), and peak flow reduction (flood control). Calculations for storage capacity and flow rate sufficient to store and treat the required water quality treatment volume were conducted. Calculation details are included in the *Preliminary Stormwater Control Plan*, which is included as Appendix J to this EIR.

In addition to the *Preliminary Stormwater Control Plan*, information from the Water Supply Assessment prepared for the proposed project, as well as the City's General Plan and associated EIR was utilized. Determinations of significance were made based on the existing or planned infrastructure's ability to accommodate the proposed project.

Project Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in comparison with the standards of significance identified above.

4.7-1 Substantially alter the existing drainage pattern of the site or area, or create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems. Based on the analysis below, the impact is *less than significant.*

The proposed project, when complete, would result in new impervious surfaces where none currently exists. Thus, an incremental reduction in the amount of natural soil surfaces available for the infiltration of rainfall and runoff would occur, potentially generating additional runoff from the site during storm events. Additional runoff could contribute to the flood potential of natural stream channels or contribute runoff that could exceed the capacity of the existing drainage system. Therefore, absent controls, the

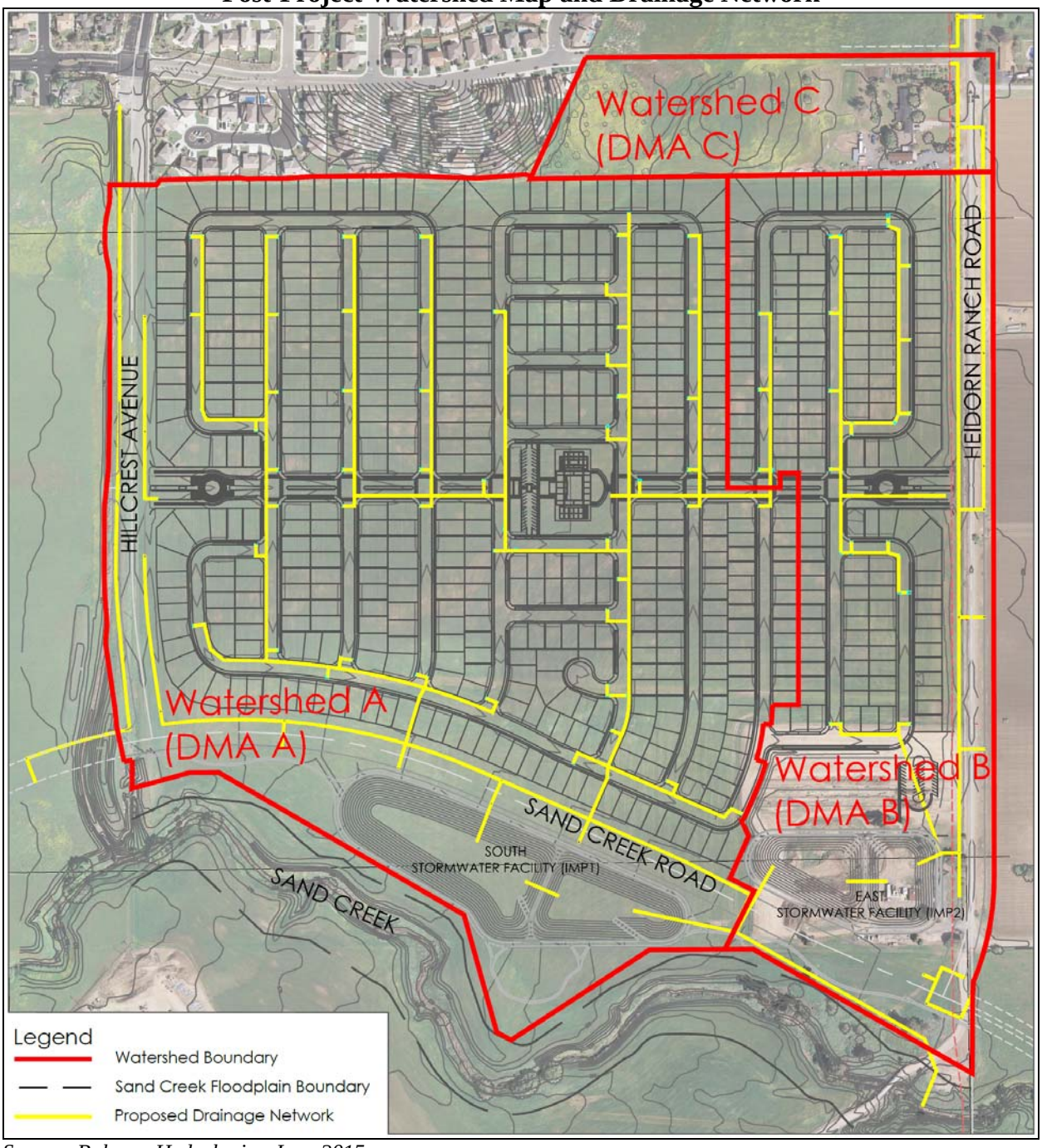
increase in impervious area on the project site could unfavorably increase the peak flow leaving the site, leading to potential negative effects downstream where runoff is discharged into Sand Creek.

The proposed project site is under the jurisdiction of the CVRWQCB and is subject to the EC3MSP and Provision C.3 requirements, and, thus, must include appropriate LID techniques to address stormwater runoff pollutant discharges and prevent increases in runoff flows. In order to meet the requirements, the proposed project's IMPs would include two separate on-site stormwater facilities designed to allow for hydromodification management, water quality treatment, and peak flow control during large storm events.

According to the Stormwater Control Plan prepared for the proposed project, the project proposes to divide the existing property into two watersheds, Watershed A and Watershed B. Watershed A would consist of approximately 481 single-family residential homes, and Watershed B would consist of approximately 160 single-family residential homes. Watershed A makes up nearly 70 percent of the proposed project site with a total of 102.9 acres, while Watershed B makes up a total of 45.6 acres. In addition to the 148.5 acres anticipated to be disturbed on the entire project site, approximately 11.5 acres to the north of the site needs to be accounted for in the proposed project's Stormwater Control Plan study area. The off-site 11.5 acres, identified as Watershed C, consists of open space with one residence and multiple outbuildings. Changes to Watershed C are not proposed as part of the project. The post-project watersheds and proposed drainage network are shown in Figure 4.7-1. It should be noted that the proposed project includes roughly 23 acres of park and open space, divided between both drainage management areas, which does not include the 20- to 37-foot-wide frontage landscape that would run along the perimeter of the project site.

The proposed watersheds would utilize a conventional gravity-flow pipe system to convey stormwater runoff from all lots and roads into two separate stormwater facilities. Watershed A would drain to the larger of the two facilities (IMP 1), located south of the proposed Sand Creek Road. Watersheds B and C would drain to the second facility (IMP 2) located at the southeast corner of the proposed project site, just north of Sand Creek Road. The stormwater facilities would be designed in accordance with the Contra Costa County cistern and bioretention approach with extended detention basins essentially functioning as cisterns. The facilities would function as two-stage systems where runoff enters an extended detention basin for peak flow attenuation and hydromodification control, and then is sent to an adjoining bioretention basin for water quality treatment. The peak flow attenuation and hydromodification controls located in each detention basin would consist of a lower orifice sized to appropriately meter flows and a riser box structure set to act as a weir when the storage volume in the detention basin goes beyond the required hydromodification storage volume. Both of the stormwater facilities would be located relatively close to Sand Creek and would drain into the creek via one proposed outfall.

Figure 4.7-1
Post-Project Watershed Map and Drainage Network



Source: Balance Hydrologics, Inc., 2015.

The bioretention basins would be sized using the appropriate water quality calculations for required surface area. According to the Stormwater Control Plan, the minimum area and volume necessary for IMP 1 to adequately handle the post-project runoff would be 28,495 square feet and 503,478 cubic feet, respectively. The proposed design of IMP 1 would be adequate to handle an area and volume of 30,000 square feet and 530,324 cubic feet, respectively. The minimum area and volume necessary for IMP 2 to adequately handle the post-project runoff would be 14,371 square feet and 254,041 cubic feet, respectively. The proposed design of IMP 2 would be adequate to handle an area and volume of 19,570 square feet and 254,041 cubic feet, respectively. Further details regarding the sizing calculations and modeling conducted per the Stormwater Control Plan are included in Appendix J of this EIR.

Without the proposed stormwater facilities, post-project peak discharge would be expected to increase from existing conditions of 37.7 cfs for the 10-year 12-hour storm and 107.5 cfs for the 100-year 24-hour storm to a maximum of 157.3 cfs for the 10-year 12-hour event to 240.9 for the 100-year 24-hour storm. According to the Stormwater Control Plan, the predicted peak flow rate for the 100-year 24-hour storm with the proposed stormwater facilities is 68.3 cfs, which is a reduction of 39.2 cfs from existing conditions. The maximum water surface elevations (WSEs) in the stormwater facilities would occur during the 100-year 24-hour storm. Each detention basin and the bioretention basin would be separated by an interior berm and would, therefore, maintain different WSEs. The peak WSE in the IMP 1 detention basin during the 100-year 24-hour storm would be 154.1 feet, while the peak WSE in the bioretention basin would be 149.6 feet. For the IMP 2, the 100-year 24-hour peak WSE in the detention basin would be 147.9 feet, while the peak WSE in the bioretention basin would be 140.6 feet.

Accordingly, both stormwater facilities would be able to accommodate the predicted peak flows of the proposed project while maintaining two feet of freeboard. It should be noted that both of the proposed stormwater facilities would be located within the Rincon Clay Loam soils, where the infiltration rate is highest in comparison to the other on-site soils. Thus, a small portion of the stormwater that enters each IMP would be allowed to infiltrate and percolate into the underlying soils and provide a small contribution to flow-control. Overall, the proposed stormwater facilities and outlet control structures would be effective in attenuating post-project peak flow rates to below existing conditions during large storm events. As a result, the subsequent flow being drained into Sand Creek via the new outfall structure would be less than what is currently discharged into the creek and would not cause any negative effects downstream.

The proposed stormwater facilities would be maintained regularly, with maintenance including removal of sediment accumulation and coarse debris that would otherwise have the potential to clog the orifices.

It should be noted that the project is anticipated to be built out in two phases, with the first phase to consist of the northern 65 acres. Rather than constructing both of the aforementioned stormwater facilities within the first phase of development, the entire watershed associated with the first phase of development, as well as the northern off-site

11.5 acres, would be directed to IMP 2. Although IMP 2 would be sized adequate to handle the bioretention floor area necessary to treat the potential runoff from the first phase of development, the capacity is not sufficient to meet the County's hydromodification capacity requirements. In order to meet the hydromodification requirements, an interim detention basin would be constructed adjacent to IMP and would be cross-connected to provide the additional storage capacity necessary. The orifice diameter proposed for the ultimate buildout condition would be used beginning in the first phase of project development, preventing the need for future retrofit. Upon completion of IMP 1 during the second phase of project development, the project storm drain system would be reconfigured to route runoff from watersheds A and B accordingly, as discussed above.

In conclusion, although implementation of the proposed project would alter the existing drainage pattern of the site and area, with incorporation of the proposed stormwater facilities, the resultant contribution of runoff water to the existing drainage system would be less than under existing conditions. Therefore, impacts would be considered ***less than significant***.

Mitigation Measure(s)
None required.

4.7-2 Violate any water quality standards or waste discharge requirements, provide substantial additional sources of polluted runoff, or otherwise substantially degrade water quality during construction. Based on the analysis below, the impact is *less than significant.*

Construction would require grading, excavation, and other construction-related activities that could cause soil erosion at an accelerated rate during storm events. All of these activities have the potential to affect water quality and contribute to localized violations of water quality standards if stormwater runoff from construction activities enters receiving waters.

Construction activities such as grading, excavation, and trenching for site improvements would result in the disturbance of on-site soils. The exposed soils have the potential to affect water quality in two ways: 1) suspended soil particles and sediments transported through runoff; or 2) sediments transported as dust that eventually reach local water bodies. Spills or leaks from heavy equipment and machinery, staging areas, or building sites also have the potential to enter runoff. Typical pollutants include, but are not limited to, petroleum and heavy metals from equipment and products such as paints, solvents, and cleaning agents, which could contain hazardous constituents. Sediment from erosion of graded or excavated surface materials, leaks or spills from equipment, or inadvertent releases of building products could result in water quality degradation if runoff containing the sediment or contaminants should enter receiving waters in sufficient quantities. Impacts from construction-related activities would generally be short-term and of limited duration.

Because the proposed project would require construction activities that would result in a land disturbance greater than one acre, the applicant would be required by the State to obtain a General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit), which pertains to pollution from grading and project construction. Compliance with the Permit requires the project applicant to file a Notice of Intent (NOI) with the SWRCB and prepare a SWPPP prior to construction. The SWPPP would incorporate BMPs in order to prevent, or reduce to the greatest feasible extent, adverse impacts to water quality from erosion and sedimentation. It should be noted that additional BMPs and permits would be required for the installation of the proposed new stormwater outfall structure in Sand Creek in order to avoid impacts to Sand Creek (see Chapter 4.3, Biological Resources, of this EIR). The project's required compliance with the SWRCB standards and additional BMPs and permits would ensure that construction activities would not result in degradation of downstream water quality. Therefore, the proposed project would result in a ***less than significant*** impact related to short-term construction-related water quality.

Mitigation Measure(s)
None required.

4.7-3 Violate any water quality standards or waste discharge requirements, provide substantial additional sources of polluted runoff, or otherwise substantially degrade water quality during operations. Based on the analysis below, the impact is *less than significant.*

The project facilities (e.g., homes, paved driveways, and roads) would involve a substantial amount of new impervious surface, which could increase the amount of surface runoff as well as convey non-point-source contaminants to surface waters during storm events. Additional runoff could accelerate soil erosion and stream channel scour, and provide a more lucrative means of transport for pollutants to enter the waterways. Contaminated runoff waters could flow into Sand Creek and degrade the water quality.

During the dry season, vehicles and other urban activities release contaminants onto the impervious surfaces, where they would accumulate until the first storm event. During this initial storm event, or first flush, the concentrated pollutants would be transported via runoff to stormwater drainage systems. Runoff contaminants associated with the proposed project could include sediment, pesticides, oil and grease, nutrients, metals, bacteria, and trash. It should be noted that some of these contaminants may have occurred in the past related to the previous agricultural uses on the project site.

As discussed above, the proposed project includes on-site stormwater facilities that would be designed sufficient to reduce stormwater from the project site below existing conditions. The stormwater facilities include bioretention basins, also known as bio-filtration) for water quality treatment. Bioretention basins are shallow basins used to slow and treat on-site stormwater runoff. According to the *Stormwater C.3 Guidebook*, bioretention facilities allow runoff water collected to be evapotranspirated or infiltrated to surrounding soils, and the remaining volume would be discharged through an underdrain

that carries runoff to a discharge point. Pollutants in the runoff are removed via grass and vegetation prior to runoff being allowed to seep into native soils below or discharged through outlets. The bioretention basins would be constructed per Provision C.3 requirements, including the soil mix, soil and drainage layer, and subsurface volume. Perforated pipe would be bedded near the top of the gravel layer and connect directly to the downstream storm drain system. In addition, energy dissipaters, curb cuts, and grate inlets will be used as necessary to reduce erosion within the bioretention areas. Overall, the on-site stormwater facilities would be sufficient to ensure that water quality standards or waste discharge requirements are not violated and water quality is not degraded as a result of the proposed project operations.

It should be noted that the proposed project has been designed to limit the amount of directly connected impervious areas to the stormwater facilities, allowing some infiltration and filtration of pollutants through landscaping and open space uses. Other proposed pollution control measures include regular maintenance activities, such as street sweeping and storm drain inlet cleaning, and stenciling all storm drain inlets with appropriate warnings indicating that the runoff flows to Sand Creek. Educational materials would also be provided to assist future homeowners in reducing the introduction of pollutants to the stormwater management system.

For the aforementioned reasons, urban pollutants entering and potentially polluting the local water system would not be expected to occur as a result of the proposed project. Therefore, the proposed project would not violate any water quality standards or waste discharge requirements, provide substantial additional sources of polluted runoff, or otherwise substantially degrade water quality during operations, and impacts would be ***less than significant***.

Mitigation Measure(s)
None required.

4.7-4 Substantially deplete groundwater supplies or interfere substantially with groundwater recharge. Based on the analysis below, the impact is *less than significant.*

The City of Antioch receives water supplies from the San Joaquin River and the Sacramento-San Joaquin Delta. As such, the City does not currently pump groundwater and, according to the Water Supply Assessment prepared for the proposed project, does not intend to pump groundwater from the local groundwater basin in the future. Therefore, the proposed project would not deplete groundwater supplies.

The proposed project would involve an increase in impervious surfaces (e.g., roads, driveways, and homes), which would reduce the infiltration of groundwater to the underlying groundwater aquifer. The City is located within the Tracy subbasin within the greater San Joaquin Valley Groundwater Subbasin. The project site makes up only a small portion of the total groundwater basin surface area of the region. In addition, as discussed previously, the Group C soils underlying the site generally have low natural

percolation rates that limit the potential for direct infiltration of stormwater on the site. Specifically, Capay Clay soils, which make up the majority of the underlying area proposed for the residential uses. Accordingly, an increased impervious area would have a proportionately smaller effect at the project site in comparison with a site underlain by more porous soils.

The majority of stormwater runoff from the site currently flows into Sand Creek, where waters are allowed to percolate and contribute to groundwater recharge in the area. The proposed stormwater facilities for the proposed project would include basins where percolation into the underlying groundwater could occur. Excess and treated water would be conveyed to Sand Creek. Accordingly, implementation of the proposed project would continue to allow runoff to flow into Sand Creek and contribute to groundwater recharge. Thus, development of the proposed project would not interfere substantially with groundwater recharge.

Because the proposed project would not increase the demand for groundwater supplies, is not located on a site considered an area of substantial groundwater recharge, would include basins that would allow stormwater to percolate through the soil, and would continue to allow stormwater to drain to natural drainage channels where a contribution to groundwater recharge occurs, impacts to groundwater supply and recharge would be considered ***less than significant***.

Mitigation Measure(s)
None required.

4.7-5 Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or flood hazard delineation map, or place within a 100-year floodplain structures which would impede or redirect flood flows. Based on the analysis below, the impact is *less than significant*.

As discussed above, the entirety of the proposed project site is within Flood Hazard Zone X, which is an area of minimal flood hazard. Directly south of the site, along Sand Creek, is designated Zone A, which is an area subject to inundation by the one-percent-annual-chance flood event. The Sand Creek floodplain boundary is depicted in Figure 4.7-1. As could be seen in the figure, the proposed project would not encroach into any mapped floodplain areas, with the exception of minor work to construct a storm drain outfall structure, which would comply with all necessary permits and regulations. Compliance with the necessary permits and regulations would ensure that the proposed outfall structure would not impede or redirect flood flows. All development proposed for the project would be located over 250 feet from Sand Creek and separated by the future alignment of Sand Creek Road. The larger of the two proposed stormwater facilities would be located south of Sand Creek Road, but would remain outside of the 100-year floodplain.

It should be noted that a tailwater elevation in Sand Creek was estimated in order to assess any potential backwater effects due to the eastern stormwater facility being in

close proximity to the proposed outfall. According to the Stormwater Control Plan, the water surface elevation where the proposed Sand Creek outfall is to be located was estimated to be 136.4 feet relative to the creek bottom elevation of 133.8 feet. The ultimate discharge from the two stormwater facilities has been set to outfall into Sand Creek at an invert elevation of 134.4 feet. The two feet below the calculated tailwater elevation does not appear to be of concern according to the Stormwater Control Plan. In any case, including a large storm event, the project site runoff would provide a sufficient amount of head in the bioretention basin to prevent any backwater effect throughout the system. Additionally, the IMP 2 bioretention soil layer would be slightly above the estimated tailwater elevation; thus, if backwatering does occur, effects on the bioretention media in regards to maintenance activity would not result.

Overall, development of the proposed project would not place any housing or structures within the floodplain boundary and would not impede or redirect flood flows. Therefore, impacts would be ***less than significant***.

Mitigation Measure(s)
None required.

4.7-6 Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam. Based on the analysis below, the impact is *less than significant*.

According to the City's General Plan EIR, the City of Antioch is located below the Contra Loma Dam and Reservoir. The Bureau of Reclamation Division of Dam Safety determined that "safe performance of the dam can be expected under all anticipated loading conditions, including the maximum credible earthquake and probable maximum flood events." The overall safety classification of the dam is registered as satisfactory. The General Plan EIR concludes that with implementation of the City's Policy 11.8.2-f, which requires regular review and clarification of emergency evacuation plans in the event of dam failure, any potential impacts related to dam failure would be reduced to a less-than-significant level. Therefore, people or structures at the proposed project site would not be exposed to a significant risk or loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam, and impacts would be ***less than significant***.

Mitigation Measure(s)
None required.

4.7-7 Inundation by seiche, tsunami, or mudflow. Based on the analysis below, the project would have *no impact*.

Tsunamis typically affect coastlines and areas up to ¼-mile inland. The proposed project is located over 50 miles from the Pacific Ocean. Due to the project's distance from the coast, potential flooding effects related to a tsunami would be minimal. The nearest enclosed body of water to the project site is the Contra Loma Reservoir, which is located

over 3.5 miles northwest of the project site. Moderate hillsides surround the City to the south. Due to the project site's distance from the nearest enclosed body of water and regional topography, the project site would not be susceptible to flooding resulting from a seiche. The project site is relatively flat and steep slopes are not located in close proximity to the site; thus, mudflows would not pose a threat to the proposed project. Overall, the proposed project would result in ***no impact*** related to inundation by seiche, tsunami, or mudflow.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in combination with other proposed and pending projects in the region. Other proposed and pending projects in the region under the cumulative context would include buildout of the City of Antioch General Plan, as well as development of the most recent planned land uses within the vicinity of the project area.

4.7-5 Cumulative impacts to hydrology and water quality. Based on the analysis below, the impact is *less than significant.*

Buildout of the proposed project in conjunction with the City's General Plan, including development of other planned and reasonably foreseeable projects within the City, would result in an overall increase in impervious surfaces in the area. The increase in impervious surfaces, if not adequately controlled, could result in degradation of the water quality and hydromodification of local streams, waterways, and downstream water bodies. In order to address such potential impacts from cumulative development, a number of regulations and development standards have been established to protect and enhance the water quality of watercourses, including the CWA, NPDES program, and the County Watershed Program and EC3MSP, including Provision C.3.

The aforementioned regulations are set forth with the intention to protect waterways from potential degradation from increased runoff and pollutants associated with cumulative development by requiring source control, site design measures, and stormwater treatment measures. Regulations such as the Provision C.3 requirements would reduce hydrology and water quality effects associated with cumulative development by eliminating or controlling stormwater discharges and associated pollutants to local stormwater systems or waterways. Specifically, Provision C.3 requires that new development and redevelopment projects include stormwater control measures sufficient to ensure that post-development flows do not exceed pre-development flows.

All development within the City of Antioch would be required to comply with all applicable regulatory stormwater documents, standards, and requirements (including EC3MSP and Provision C.3). Because each future project would be required to implement measures sufficient to avoid hydromodification, address water quality, and

ensure that runoff volumes and rates do not exceed pre-development conditions, each project, similar to the proposed project, would be expected to result in less-than-significant project-level impacts related to hydrology and water quality. As a result, cumulative development within the City of Antioch would result in a ***less-than-significant*** impact related to hydrology (drainage and flooding), water quality, and stormwater quality.

Mitigation Measure(s)
None required.

Endnotes

[1] Balance Hydrologics, Inc. *Preliminary Stormwater Control Plan for Promenade Vineyards at Sand Creek, City of Antioch, California.* January 23, 2015.
[2] RMC Water and Environment. *Review of Preliminary Stormwater Control Plan for Promenade Vineyards at Sand Creek*. February 24, 2015.
[3] Balance Hydrologics, Inc. *Response to Comments Dated February 24, 2015, from the RMC Water and Environment Related to the Preliminary Stormwater Control Plan for Promenade, Vineyards at Sand Creek, City of Antioch*. March 2, 2015.
[4] Balance Hydrologics, Inc. *Preliminary Stormwater Control Plan for Promenade Vineyards at Sand Creek, City of Antioch, California.* March 2, 2015.
[5] City of Antioch. *City of Antioch General Plan*. Updated November 24, 2003.
[6] City of Antioch. *Draft General Plan Update Environmental Impact Report*. July 2003.
[7] West Yost Associates. *Water Supply Assessment for Vineyards at Sand Creek.* January 2015.
[8] Contra Costa Clean Water Program and Dan Cloak Environmental Consulting. *Stormwater C.3 Guidebook, Stormwater Quality Requirements for Development Applications, 6th Edition*. February 15, 2012.

4.8 LAND USE AND PLANNING / AGRICULTURAL RESOURCES

4.8 LAND USE AND PLANNING / AGRICULTURAL RESOURCES

4.8.1 INTRODUCTION

The purpose of the Land Use and Planning / Agricultural Resources chapter of the EIR is to examine the proposed project's compatibility with existing and planned land uses in the area. The Land Use and Planning / Agricultural Resources chapter discussion differs from other sections of this EIR in that, for the Land Use and Planning / Agricultural Resources discussion, plan consistencies are addressed, as opposed to environmental impacts and mitigation measures. Section 15125(d) of the California Environmental Quality Act (CEQA) Guidelines states that "[…] the EIR shall discuss any inconsistencies between the proposed project and applicable general plans and regional plans." The Land Use and Planning / Agricultural Resources chapter discussions include a description of the existing land use setting of the project site and the adjacent area, including the identification of existing land uses and current General Plan policies and zoning designations, as well as population and housing, and agricultural resources impacts. The information contained in this analysis is based on the *City of Antioch General Plan,*[1] and associated EIR,[2] and the *City of Antioch, California Code of Ordinances.*[3]

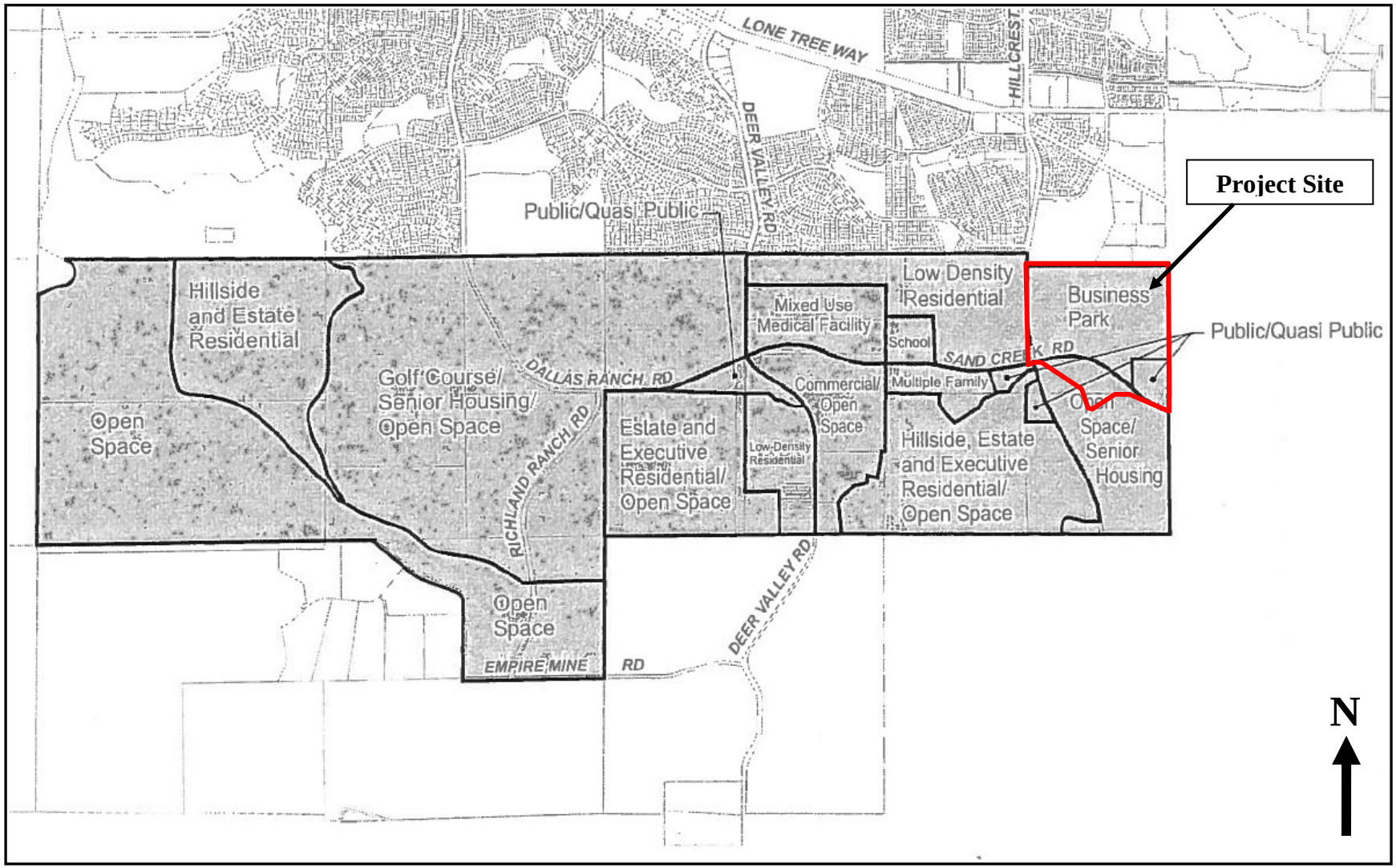
4.8.2 EXISTING ENVIRONMENTAL SETTING

The following section describes the existing land uses on the project site, at the time the NOP was published on September 5, 2014, as well as the existing plans and policies that guide the development of the project site. In addition, the Existing Environmental Setting section describes current farmland and soil productivity classification systems, as well as the extent and quality of any agricultural and forest resources present on the project site.

Project Site Characteristics

The Vineyards at Sand Creek Project (proposed project) is located in the southeastern portion of the City of Antioch in eastern Contra Costa County, California. The project site is located within the northeastern corner of the Sand Creek Focus Area of the General Plan, which contains lands designated by the Antioch General Plan for open space, residential, business park, commercial, and mixed-use development (see Figure 4.8-1). The Sand Creek Focus Area of the General Plan encompasses approximately 2,712 acres in the southern portion of the City of Antioch.

Figure 4.8-1
Existing Sand Creek Focus Area Land Use Designations



Source: City of Antioch General Plan. November 24, 2003.

The project site consists of approximately 141.6 acres of undeveloped, farm land, and is bounded by a residential subdivision to the north, Sand Creek to the south, Heidorn Ranch Road and City of Brentwood City limits to the east, and vacant residential land to the west planned for the future extension of Hillcrest Avenue and residential development. The project site is surrounded by a mixture of uses including existing and planned single-family residential uses to the north; the undeveloped but approved Aviano residential project to the west, undeveloped land planned for future residential, mixed use, and commercial development in Brentwood to the east; and Sand Creek, a PG&E facility, and undeveloped farm land to the south.

Existing City of Antioch General Plan Land Use Designations

According to the Antioch General Plan, the 141.6-acre project site is designated as Business Park (BP), Public/Quasi Public (P-QP), Open Space (OS), and Senior Housing (SH) within the Sand Creek Focus Area (see Figure 4.8-2). The project site's land use designations according to the City General Plan are discussed in further detail below.

Business Park

The primary purpose of lands designated BP on the Antioch General Plan land use map is to provide for light industrial, research and development, and office-based firms seeking an attractive and pleasant working environment and a prestigious location. BP areas are typically labor-intensive, meaning that the density of employment is higher than areas involving mostly manufacturing or warehouse uses. BP development may occur as a single use, a subdivision wherein individual entities own and operate their businesses, or as multi-tenant complexes. Up to 280 acres within the Sand Creek Focus Area of the General Plan are to be devoted to employment-generating uses. The BP land use designation has a maximum allowable development intensity of 0.5 Floor Area Ratio (FAR).

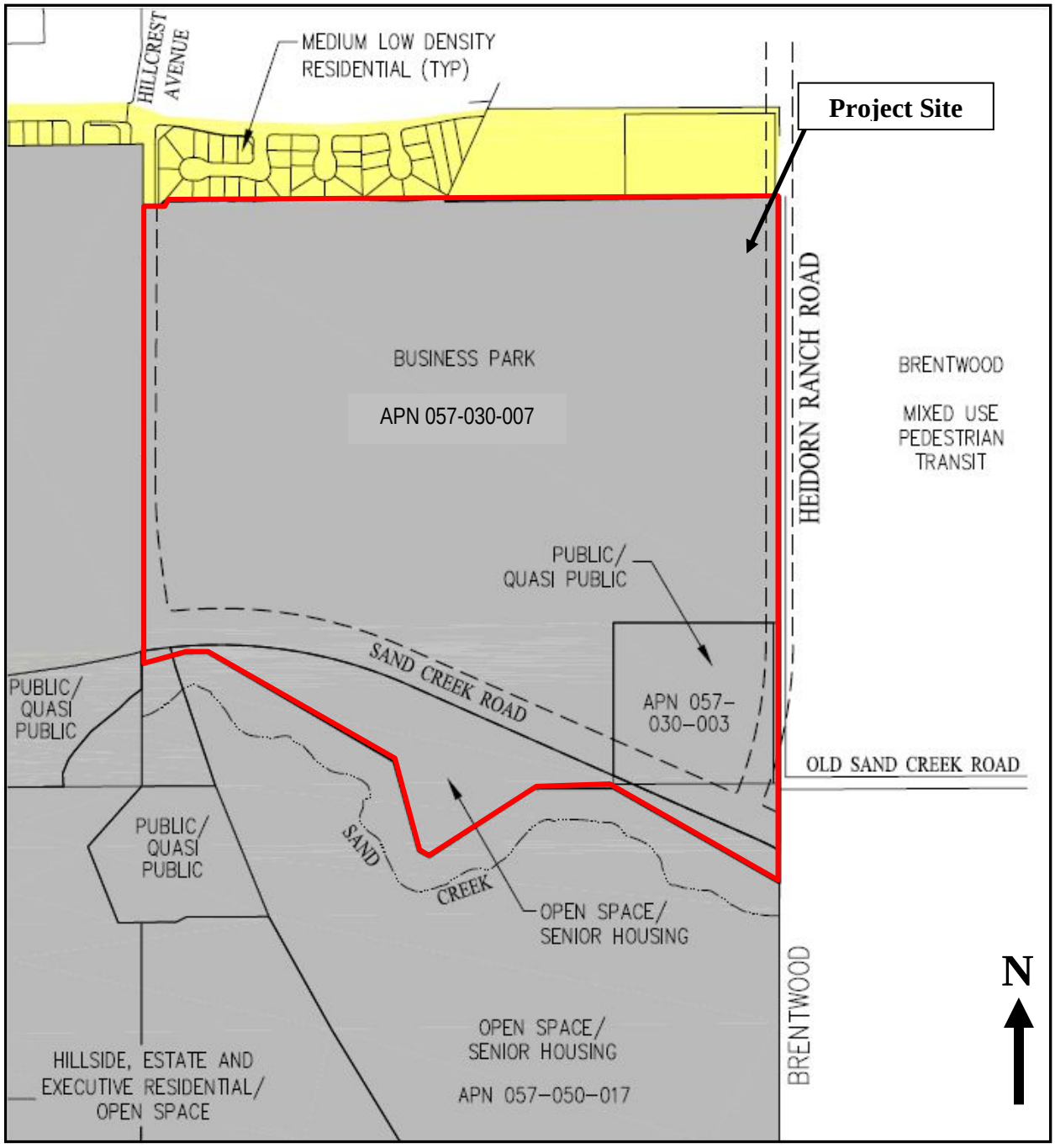
Public/Quasi Public

The P-QP land use designation is used to designate public land and institutional uses, including public and private schools and colleges, public corporation yards, libraries, fire stations, police stations, water treatment facilities, animal shelters, public and private museums churches, and governmental offices. The P-QP land use designation has a maximum allowable development intensity of 0.5 Floor Area Ratio (FAR).

Open Space/Senior Housing

The OS land use designation is intended for areas that include parks, as well as other open space areas. Certain open space areas, such as those that exist to protect sensitive environmental resources, might not be open to public use, while other lands may be owned and managed by private entities, and therefore not open to the general public. The most prevalent public open space uses are City and regional parks, as well as private open space areas within residential developments.

Figure 4.8-2
Existing City of Antioch General Plan Land Use Designations



The locations of existing and programmed neighborhood and community parks are in most cases specifically defined on the Land Use Map. In the case of a park whose acquisition has been programmed, the ultimate configuration of the park may be different from that which is shown on the General Plan land use map. In addition to public parks and open spaces, this category designates certain privately owned lands used for recreation and low-intensity, open space activities. Appropriate private sector uses in this category include cemeteries and land that is restricted to agricultural use. This designation also includes a higher intensity of uses that are of open space character. The range of allowable uses includes, but is not limited to, country clubs (excluding golf course-oriented residential uses), golf courses, tennis clubs, driving ranges, equestrian centers, marinas, and other privately owned areas reserved for active recreational use.

Age-restricted senior housing within the Focus Area is intended as a means of expanding the range of housing choice within Antioch, while reducing the Focus Area's overall traffic and school impacts. Such senior housing may consist of Single-family detached, Small Lot Single-family detached, of Multi-family attached housing, and may be developed in any of the residential areas of the Sand Creek Focus Area of the General Plan. Areas identified specifically for senior housing may include limited areas of non-senior housing where environmental or topographic constraints would limit development densities to a range more compatible with estate housing than with senior housing.

Existing City of Antioch Zoning Designations

According to the City of Antioch the project site is zoned Study Zone (S). The S district is intended as an interim designation which is utilized until all necessary detailed land use studies are completed for a given area. The S district is most appropriately applied to properties at the time that they are prezoned prior to annexation by the City.

Adjacent General Plan Land Use Designations

The City of Antioch and Brentwood have adopted the following General Plan land use designations for the areas surrounding the project site:

North	Medium Low Density Residential (MLDR) (City of Antioch)
South	OS/SH (Sand Creek Focus Area) (City of Antioch)
East	Mixed Use Pedestrian Transit (MUPT) (City of Brentwood)
West	Low Density Residential (LDR) (Sand Creek Focus Area) (City of Antioch)

<u>City of Antioch</u>

The OS and SH land use designations have been described above. The City of Antioch General Plan defines the LDR and MLDR designations as follows:

Low Density Residential

The LDR land use designation is generally characterized by single-family homes in traditional subdivisions. Areas designated LDR are typically located on gently rolling terrain with minimal

geological or environmental constraints. The LDR land use designation has a maximum allowable density of four dwelling units per gross developable acre (4 du/ac), which results in an anticipated population of 12 to 14 persons per acre.

Medium Low Density Residential

The MLDR land use designation is generally characterized by single-family homes in typical subdivision development, as well as other detached housing such as zero lot line units, patio homes, and duplex development. Areas designated MLDR are typically located on level terrain with minimal geological or environmental constraints. The MLDR land use designation has a maximum allowable density of six dwelling units per gross developable acre (6 du/ac), which results in an anticipated population per acre of 14 to 18 persons per acre.

City of Brentwood

The City of Brentwood General Plan defines the MUPT General Plan land use designation as follows:

Mixed Use Pedestrian Transit

According to the City of Brentwood's General Plan, the MUPT designation shall be developed predominately with jobs-generating and commercial uses. The MUPT designation is intended to provide high-quality jobs in office, professional, research and technology, and light industry sectors, and to allow commercial uses with a regional focus.

Other uses may include integrated medium to very high density residential development and amenities, including services, restaurants, and recreation opportunities, in a pedestrian-friendly environment. Multi-family housing units will be allowed at a density of 5.1 to 30.0 units per acre, in accordance with the policy direction provided by Priority Area 1.[4]

Adjacent Zoning Designations

The City of Antioch and Brentwood have adopted the following zoning designations for the areas surrounding the project site:

North	Planned Development (P-D) (City of Antioch)
South	Study Zone (S) (City of Antioch)
East	Planned Development Zone (PD) (City of Brentwood)
West	S, P-D (LDR) (City of Antioch)

City of Antioch

The S zoning designation has been described above. The City of Antioch, California Code of Ordinances defines the P-D zoning designations as follows:

Planned Development

The P-D zoning designation is intended to accommodate a wide range of residential, commercial and industrial land uses which are mutually supportive and compatible with existing and proposed development on surrounding properties. P-D zoning designations shall encourage the use of flexible development standards designed to appropriately integrate a project into the natural and/or man-made setting and shall provide for a mix of land uses to serve identified community needs. In addition, P-D zoning designations shall orient pedestrian and bicycle facilities to encourage non-auto oriented circulation within the development.

City of Brentwood

The Brentwood Municipal Code defines the PD zone as follows:

According to the Brentwood Municipal Code, the PD zone is intended to allow a mixture of uses, unusual building intensity or design characteristics, or variations in density including density between the midrange and upper end of land use designated by the general plan, which would not normally be permitted in a single use zone. The PD zone is intended to implement specific plans prepared for specific plan areas designated by the community development plan of the City of Brentwood, and to implement other specific plans which may be adopted by the Brentwood City Council, by providing regulations for the adoption of planned development zones for all or part of the area encompassed by each adopted specific plan.[5]

Farmland Classifications

The Farmland Mapping and Monitoring Program (FMMP), part of the Division of Land Resource Protection, California Department of Conservation (DOC), uses soil agricultural productivity information from the Natural Resources Conservation Service (NRCS) to create maps illustrating the types of farmland in the area.

The FMMP was established in 1982 to continue the Important Farmland mapping efforts begun in 1975 by the United States Department of Agriculture (USDA). The intent of the USDA was to produce agriculture maps based on soil quality and land use across the nation. As part of the nationwide agricultural land use mapping effort, the USDA developed a series of definitions known as Land Inventory and Monitoring (LIM) criteria. The LIM criteria classified the land's suitability for agricultural production; suitability included both the physical and chemical characteristics of soils and the actual land use. Important Farmland maps are derived from the USDA soil survey maps using the LIM criteria.

Since 1980, the State of California has assisted the USDA with completing the mapping in the State. The FMMP was created within the California DOC to carry on the mapping activity on a continuing basis, and with a greater level of detail. The California DOC applied a greater level of detail by modifying the LIM criteria for use in California. The LIM criteria in California utilize the Land Capability Classification and Storie Index Rating systems, but also consider physical conditions such as dependable water supply for agricultural production, soil temperature range, depth of the groundwater table, flooding potential, rock fragment content, and rooting depth.

The California DOC classifies lands into seven agriculture-related categories: Prime Farmland, Farmland of Statewide Importance (Statewide Farmland), Unique Farmland, Farmland of Local Importance (Local Farmland), Grazing Land, Urban and Built-up Land (Urban Land), and Other Land. The first four types listed above are collectively designated by the State as Important Farmlands. Important Farmland maps for California are compiled using the modified LIM criteria and current land use information. The minimum mapping unit is 10 acres unless otherwise specified. Units of land smaller than 10 acres are incorporated into surrounding classifications.

Each of the seven land types are summarized below, based on California DOC's *A Guide to the Farmland Mapping and Monitoring Program*.[6]

Prime Farmland: Prime Farmland is land with the best combination of physical and chemical features able to sustain the long-term production of agricultural crops. The land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. The land must have been used for the production of irrigated crops at some time during the two update cycles (a cycle is equivalent to two years) prior to the mapping date.

Statewide Farmland: Farmland of Statewide Importance is land similar to Prime Farmland, but with minor shortcomings, such as greater slopes or with less ability to hold and store moisture. The land must have been used for the production of irrigated crops at sometime during the two update cycles prior to the mapping date.

Unique Farmland: Unique Farmland is land of lesser quality soils used for the production of the State's leading agricultural crops. The land is usually irrigated, but may include non-irrigated orchards or vineyards, as found in some climatic zones in California. The land must have been cultivated at some time during the two update cycles prior to the mapping date.

Local Farmland: Farmland of Local Importance is land of importance to the local agricultural economy, as determined by each county's Board of Supervisors and a local advisory committee. Contra Costa County local farmland includes lands which do not qualify as Prime, Statewide, or Unique designation, but are currently irrigated crops or pasture or non-irrigated crops; lands that would meet the Prime or Statewide designation and have been improved for irrigation, but are now idle; and lands that currently support confined livestock, poultry operations and aquaculture.

Grazing Land: Grazing Land is land on which the existing vegetation, whether grown naturally or through management, is suited to the grazing of livestock. The minimum mapping unit for this category is 40 acres.

Urban Land: Urban and Built-up Land is occupied with structures with a building density of at least one unit to one-half acre. Uses may include but are not limited to, residential, industrial, commercial, construction, institutional, public administration purposes, railroad yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment plants, water control structures, and other development purposes. Highways, railroads, and other transportation facilities are mapped as part of this unit, if they are part of a surrounding urban area.

Other Land: Other Land is land that is not included in any other mapping categories. The following uses are generally included: rural development, brush timber, government land, strip mines, borrow pits, and a variety of other rural land uses.

Existing Agricultural Resources

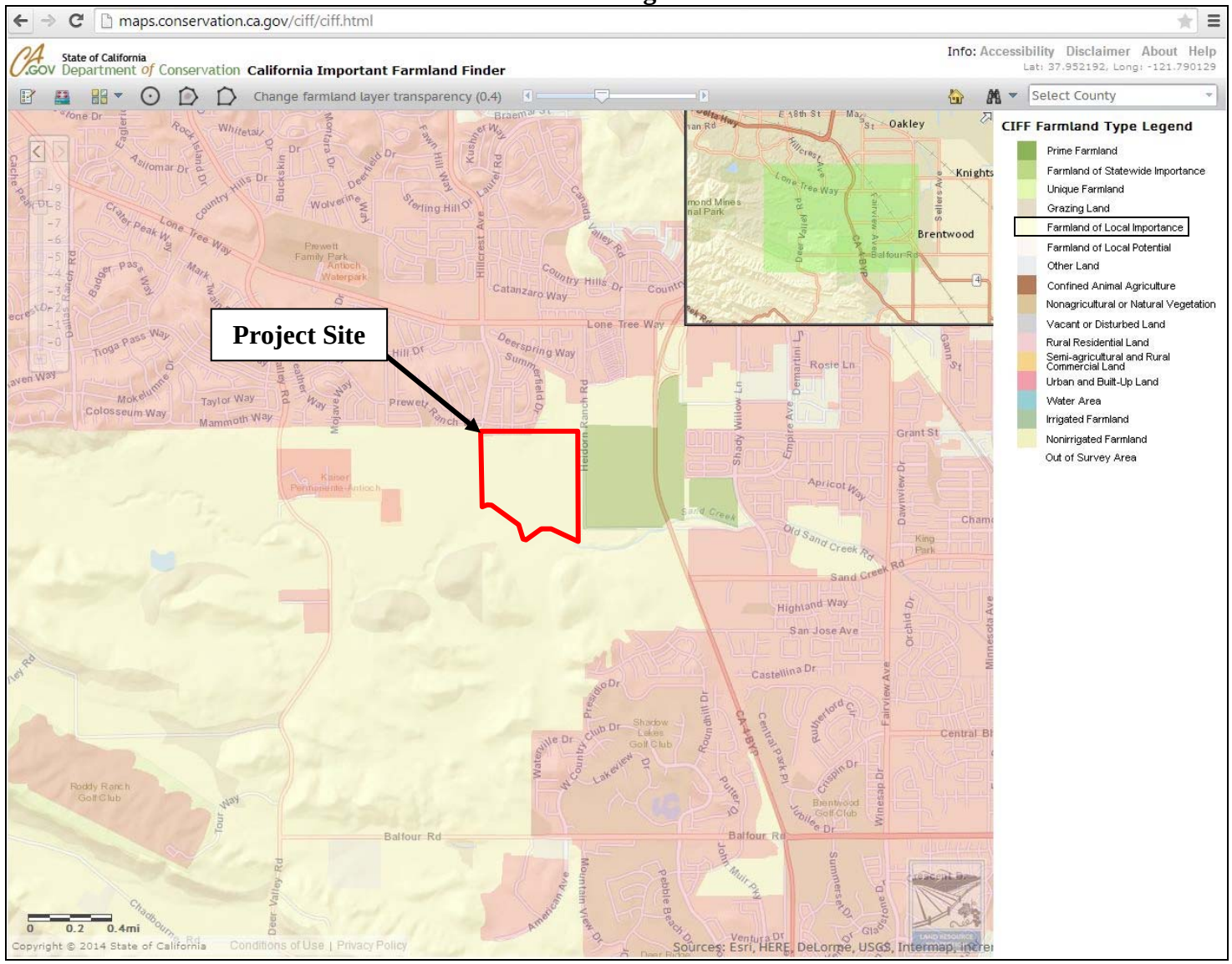
As noted previously, the project site consists of approximately 141.6 acres of undeveloped, farm land, and is bounded by a residential subdivision to the north, Sand Creek to the south, Heidorn Ranch Road and City of Brentwood City limits to the east, and vacant residential land to the west planned for the future extension of Hillcrest Avenue and residential development. According to the Contra Costa County Williamson Act map published by the California DOC, the entire project site is not under a Williamson Act contract.[7] As shown in Figure 4.8-3, the DOC has defined the entire project site as Farmland of Local Importance.

The Antioch General Plan does not identify farmland resources within the project area, and the site is not designated or zoned for farmland uses. As noted previously, the project site is designated in the City of Antioch's General Plan as BP, P-QP, and OS. The site is currently zoned Study Zone under the Antioch zoning code. In addition, forestland or timberland resources are not located on the project site.

Current Population and Population Projections

According to the Association of Bay Area Governments (ABAG), Antioch's population increased by approximately 13 percent between the years 2000 and 2010, from 90,532 residents to 102,372 residents.[8] According to the U.S. Census Bureau, Contra Costa County's population has increased at a similar pace, growing by approximately 10 percent from 2000 to 2010, from 948,816 to 1,049,025. ABAG estimates that the City's population will be 112,700 in 2020.

Figure 4.8-3
FMMP Designation



4.8.3 REGULATORY CONTEXT

The following section includes a brief summary of the regulatory context under which land use and planning / agricultural resources are managed at the federal, State, and local levels. In addition, a number of existing local land use objectives and policies relevant to the California Environmental Quality Act (CEQA) review process are presented below.

State Regulations

The following are the State environmental laws and policies relevant to land use and planning / agricultural resources.

California Land Conservation Act

Under the provisions of the Williamson Act (California Land Conservation Act 1965, Section 51200), landowners contract with the County to maintain agricultural or open space use of their lands in return for reduced property tax assessment. The contract is self-renewing and the landowner may notify the County at any time of intent to withdraw the land from its preserve status. Withdrawal involves a ten-year period of tax adjustment to full market value before protected open space can be converted to urban uses. Consequently, land under a Williamson Act Contract can be in either renewal status or non-renewal status. Lands with a non-renewal status indicate the farmer has withdrawn from the Williamson Act Contract and is waiting for a period of tax adjustment for the land to reach its full market value. As noted previously, the properties making up the proposed project site are not under a Williamson Act contract.

City of Antioch General Plan

The City of Antioch General Plan land use policies relating to the physical environment that are applicable to the proposed project are presented below in Table 4.8-1.

Rate of Growth Policies

1. Prohibit the granting of new residential development allocations for the calendar years 2006 and 2007. For the five-year period from 2006 to 2010, no more than 2,000 development allocations may be issued. Thereafter, limit the issuance of development allocations to a maximum annual average of 600, recognizing that the actual rate of growth will vary from year to year. Thus, unused development allocations issued after December 31, 2010 may be reallocated in subsequent years, and development allocations may be moved forward from future years, provided that the annual average of 600 development allocations

Agricultural uses are included in the "Open Space" land use designation in the Antioch General Plan. The General Plan contains policies intended would help reduce the impacts resulting from conversion of open lands to urban uses. However, none of these expressly address agricultural uses, forest land or timberland. Antioch's zoning code does not contain any districts expressly established for agricultural, forest land or timberland production.

4.8.4 IMPACTS AND MITIGATION MEASURES

The following section describes the standards of significance and methodology utilized to analyze and determine the proposed project's potential impacts related to land use and planning / agricultural resources.

Standards of Significance

Consistent with Appendix G of the CEQA Guidelines a land use and planning / agricultural resources impact may be considered to be significant if any potential effects of the following conditions, or potential thereof, would result with the proposed project's implementation:

- Physically divide an established community;
- Conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating a significant environmental effect;
- Conflict with any applicable habitat conservation plan or natural community conservation plan;
- 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;
- Conflict with existing zoning for agricultural use or a Williamson Act contract;
- 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));
- Result in the loss of forest land or conversion of forest land to non-forest use;
- 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;
- Induce substantial population growth in an area, either directly (for example, by proposing new homes, and businesses) or indirectly (for example, through extension of roads or other infrastructure);
- Displace substantial amounts of existing housing, necessitating the construction of replacement housing elsewhere; or
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

It should be noted that the proposed project's impacts associated with any applicable habitat conservation plan or natural community conservation plan are addressed in the Biological Resources chapter of this EIR.

Method of Analysis

Land Use and Planning

The Land Use impact evaluation qualitatively compares the uses proposed for the project to the existing and other proposed uses in the vicinity of the project site in order to determine if proposed land uses are compatible with existing or proposed uses. The determination of compatibility is based on the anticipated environmental effects of proposed uses and the sensitivity of adjacent uses to those effects. Existing land uses in the project vicinity were identified based on a site visit and information provided by the City; and planned land uses for the project site were identified based on information provided by the project applicant. The evaluation also assesses the consistency of the proposed project with the goals and policies of the City's General Plan, as well as other applicable local environmental and planning documents.

Agricultural Resources

Evaluation of potential impacts of the proposed project on agricultural resources were based on the following: the Antioch General Plan; the Antioch General Plan EIR; the USDA NRCS Web Soil Survey performed for the project site; the Soil Survey of Contra Costa County; and the Soil Candidate Listing for Prime Farmland and Farmland of Statewide Importance, Contra Costa County. The standards of significance listed above are used to delineate the significance of any potential impacts.

Population and Housing

Evaluation of potential impacts of the proposed project on population and housing were based on the following: the Antioch General Plan; the Antioch General Plan EIR; and the ABAG Projections 2009. The standards of significance listed above are used to delineate the significance of any potential impacts.

Project-Specific Impacts and Mitigation Measures

The following discussion of land use and planning / agricultural resources impacts is based on implementation of the proposed project in comparison to existing conditions and the standards of significance presented above.

4.8-1 Physical division of an established community. Based on the analysis below, the impact is *less than significant.*

The project site is currently vacant and is surrounded by a mixture of existing and planned land uses including existing single-family residential uses to the north; the undeveloped but approved Aviano Residential project to the west, undeveloped land planned for future residential, mixed use, and commercial development in Brentwood to the east; and Sand Creek, a PG&E facility and undeveloped dry-farmed land to the south (planned for future residential in the City of Antioch's General Plan). The proposed project consists of single-family residential development, including up to 650 single-

family residential units on 127.5 acres. The proposed project would expand the existing residential community that predominates the area. Therefore the proposed project's development would enhance and complement the surrounding community and provide single-family housing to serve the housing needs of the City of Antioch. Given the site's immediate vicinity to existing residential, the project would serve as an addition to the existing community of Antioch and have a ***less-than-significant*** impact related to the physical division of an established community.

Mitigation Measure(s)
None required.

4.8-2 Compatibility with surrounding uses. Based on the analysis below, the impact is *less than significant.*

As discussed above, the determination of compatibility of land uses typically relies on a general discussion of the types of adjacent uses to a proposed project and whether any sensitive receptors exist either on the adjacent properties or associated with the proposed project. Surrounding existing and planned land uses consist of the following:

North:	Single-family residential development and undeveloped land planned for future single-family residential development (Quail Cove)
South:	Sand Creek and undeveloped farm land
West:	Undeveloped land planned for future residential development (Aviano)
East:	Undeveloped land planned for future residential, mixed use, and commercial development within the City of Brentwood

As demonstrated in the above description, land uses surrounding the project site are predominantly undeveloped land and residential development. The proposed project consists of single-family residential development, including up to 650 single-family residential units on 127.5 acres; 31.6 acres of parks and landscaped areas, which would not create incompatibilities with existing residential areas. Incompatibilities between land uses result when different types of uses are adjacent to one another, such as locating a residential subdivision adjacent to an existing commercial complex or industrial park. The City of Brentwood to the east has planned mixed use and commercial development; however, these uses are not anticipated to be developed prior to the proposed project. The proposed project would not develop residences near any existing adjacent commercial or industrial centers, but would rather expand the existing residential community that predominates the area.

As a result, potential incompatibilities would not result between the proposed project and surrounding uses because said uses are predominantly undeveloped land and residential, and the project would serve as an extension of the existing residential community to the north and northeast. Therefore, impacts related to compatibility with surrounding uses would be considered ***less than significant.***

Mitigation Measure(s)
None required.

4.8-3 Consistency with the Antioch General Plan. Based on the analysis below, the impact is *less than significant*.

As described above, the 141.6-acre project site is located within the northeastern corner of the Sand Creek Focus Area of the General Plan, and is designated as BP, P-QP, and OS/SH. However, the proposed project includes the development of up to 650 single-family residential units and 31.6 acres of parks and landscaped areas (see Figure 4.8-4). As a result, the proposed project requires the approval of a General Plan Amendment of the Sand Creek Focus Area from BP, P-QP, and OS/SH designations to MLDR and OS (see Figure 4.8-5). In addition, the General Plan Amendment includes text changes to the Land Use Element of the Antioch General Plan. Section 4.4.6.7 of the Antioch General Plan, would be amended to allow the development of small lot single-family detached housing within the Sand Creek Focus Area within areas designated as MLDR, resulting in a population density of 14 to 18 persons per acre.

As part of the review of the development application, the City undertook a market analysis to determine the implications of the request to eliminate the BP designation. According to the analysis, despite the BP General Plan designation, the site location and market conditions reduce the site's desirability as a location for a business park. BP, as well as other types of commercial/office development, is sensitive to optimum location, visibility, and accessibility. The project site is adjacent to residential development and open space. The site would only have freeway visibility if taller buildings were developed on-site. According to the market analysis the City has many other large areas designated for business park development that would better suit the criteria needed and are identified in the Strategic Plan as priority areas for development. Such areas include the Hillcrest Station Specific Plan area which designates 36.6 acres for Office/TOD development and estimates 1,200,000 square feet of office space at buildout; the remainder of the East Lone Tree Specific Plan area which has approximately 60 acres of Regional Retail/Employment generating vacant land to develop which could accommodate approximately 1,307,000 square feet of office space. In addition, other areas that could accommodate office development include Rivertown, the Lone Tree Way/A Street corridor, vacant areas around Verne Roberts Circle, the large business park development between Lone Tree Way and Country Hills Drive, and the new Wilbur Annexation area which would likely include supportive or complementary office uses with future industrial development, and the East 18th Street corridor just south of the Wilbur area. According to the market analysis the City currently has a significant amount of vacant land/buildings suitable for office and business park development/redevelopment.

Figure 4.8-4
Proposed Project Tentative Map

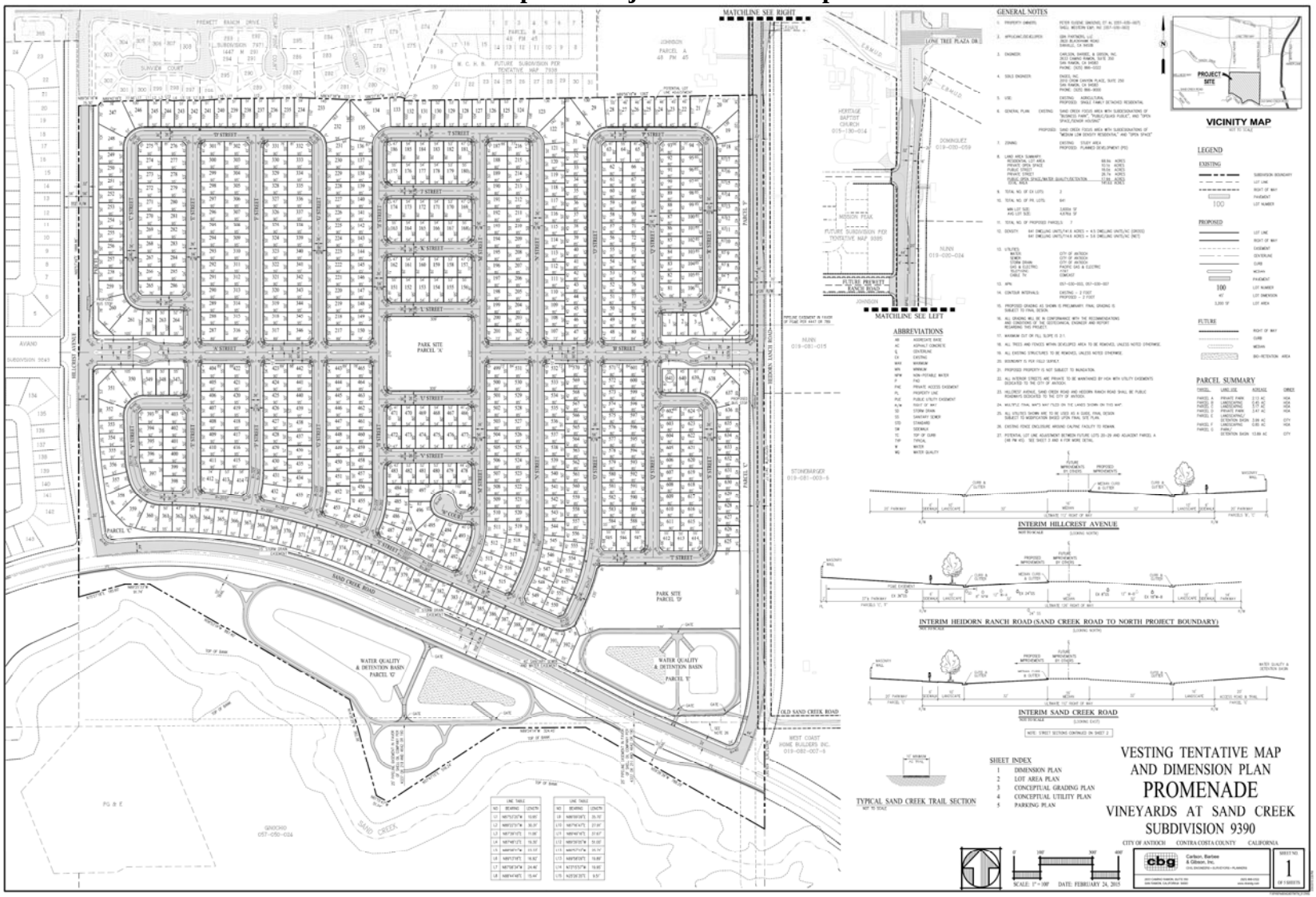
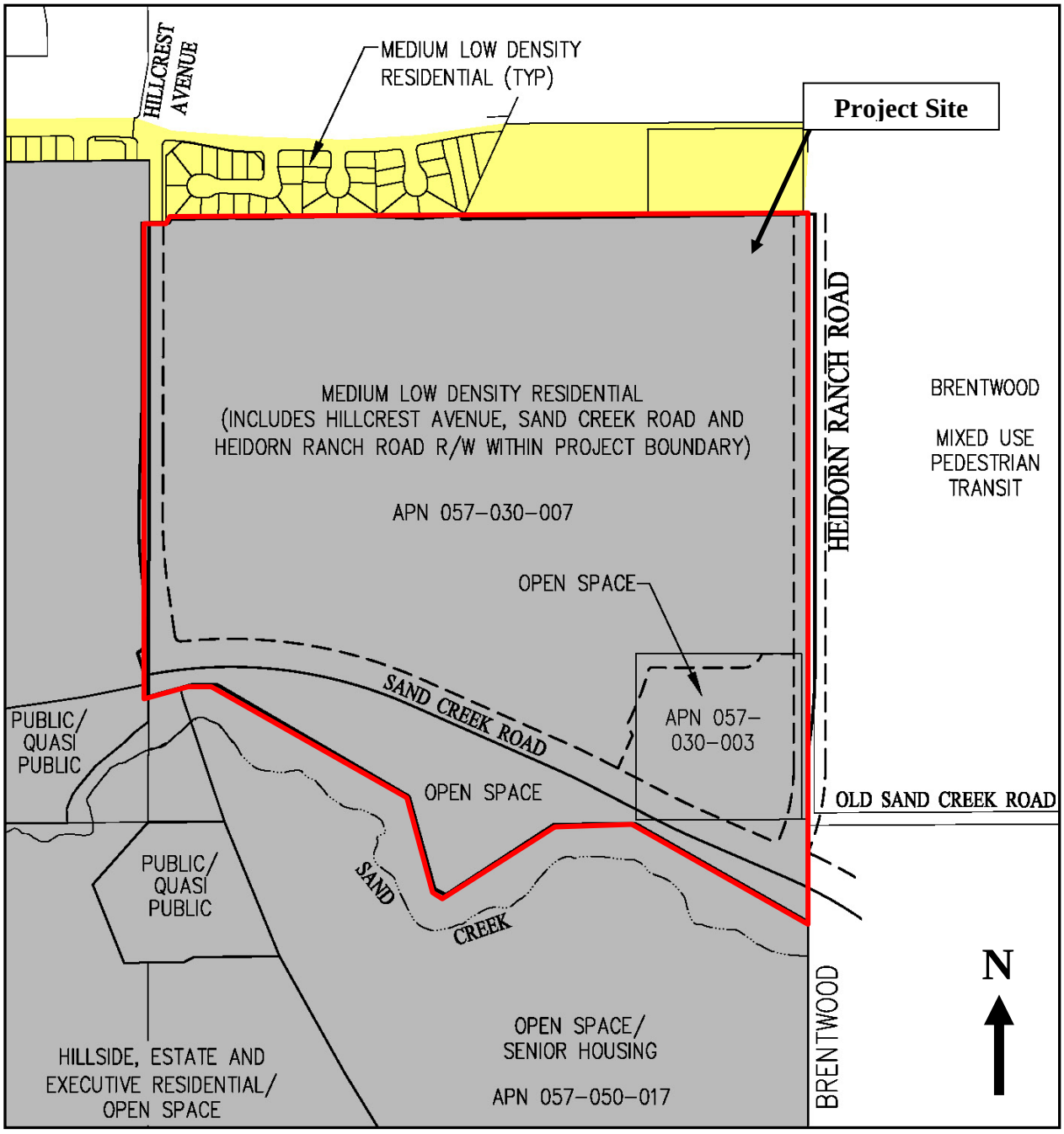


Figure 4.8-5
Proposed General Plan Amendment



Should the Antioch City Council approve the General Plan Amendment, the single-family and open space uses proposed for the project site would be consistent with the General Plan land use designations of MLDR. In order to demonstrate the project's consistency with the Antioch General Plan, Table 4.8-1 includes a list of the relevant General Plan policies and a corresponding discussion of whether the project is consistent with each policy. As demonstrated in the table, the proposed project is generally consistent with the relevant Antioch General Plan policies. Therefore, with Council approval of the General Plan Amendment, the project would have a ***less-than-significant*** impact regarding General Plan consistency.

Mitigation Measure(s)
None required.

4.8-4 Consistency with existing zoning. Based on the analysis below, the impact is *less than significant.*

As described above, the proposed project site is located within the Sand Creek Focus Area of the General Plan and is zoned S. As a result, the proposed project requires the approval of a Master Development Plan (MDP), Final Development Plan, and P-D rezone. The MDP and rezone to P-D district is intended to set the development standards applicable to the project site, including the maximum density and maximum number of units, minimum lot size, landscape requirements, open space requirements, architectural guidelines, and maximum building heights and lot coverage.

As required by Section 9-5.2307 of the Antioch Municipal Code, a preliminary development plan has already been reviewed by the Antioch Planning Commission. The City Council shall determine whether or not the land uses suggested and their interrelationships are generally acceptable and may approve, modify or deny the proposed project. Furthermore, approval of a use permit by the Planning Commission shall also be required prior to the construction of any phase of the approved P-D district. It should also be noted that as part of the P-D, development standards and design guidelines have been prepared to guide development. Therefore, should the Planning Commission and City Council approve the above stated approvals, the project would be consistent with the City of Antioch's zoning and a ***less-than-significant*** impact would result.

Mitigation Measure(s)
None required.

Table 4.8-1
Antioch General Plan Policy Discussion

Policy		Project Consistency
Growth Management Element		
3.5.3.1	Maintain a force level within a range of 1.2 to 1.5 officers, including community service officers assigned to community policing and prisoner custody details, per 1,000 population. The ratio of community service officers assigned to community policing and prisoner custody details to sworn officers shall not exceed 20 percent of the total number of sworn officers.	As described in the Public Services, Recreation, and Utilities chapter of this EIR, the Antioch Police Department (PD) is responsible for providing law enforcement services within the City of Antioch. The Antioch PD operates out of the police headquarters at 300 L Street, and is currently budgeted for 124 sworn and 59 non-sworn employees.[9] The City of Antioch's current population is 107,100,[10] which results in a current staffing ratio for the Antioch PD of approximately 1.0 per 1,000 residents. According to the Antioch General Plan EIR, population growth has created an increased demand for police-related services, and consequently a need for additional Antioch PD staff. The General Plan EIR identified that without new funding sources the changes in the staffing ratio is unlikely; however, as population increases, additional officers would need to be hired to maintain the required ratio.[11] The Development Agreement for the proposed project would include a special tax or other financing mechanism to fund additional officers needed to serve development. In addition, in November 2014, the City of Antioch residents passed Measure O, which became effective in December 2014. Measure O updates the existing business license tax ordinance and requires residential landlords to pay a per unit, per year tax for single-family dwelling units of $250.00 and $150.00 for multi-family rental units. The intent of Measure O is to provide General Fund revenue, which primarily funds the Antioch PD. Measure O is anticipated to increase funding for the Antioch PD for the purpose of expanding law enforcement facilities and hiring additional sworn officers. Due to the recently voter approved Measure O, in combination with the special tax or other financing mechanism in the Development Agreement, the Antioch PD is anticipated to continue to serve the project site and provide law enforcement services to the new residents upon project buildout.
3.8.2a	Maintain an inventory of employment-generating lands, providing for a variety of office-based, industrial, and	Should the Antioch City Council approve the proposed General Plan Amendment, the amount of land planned for employment-generating uses

Table 4.8-1 Antioch General Plan Policy Discussion		
Policy		**Project Consistency**
	commercial (retail and service) employment opportunities.	in the Sand Creek Focus Area of the General Plan would be reduced by approximately 127 acres. Approximately 153 acres of employment-generating lands including Commercial/Open Space and Mixed Use Medical Facility would remain within the Sand Creek Focus Area of the General Plan. The market analysis prepared as part of the development application determined that adequate employment generating lands exist in other areas of the City to meet demand for future business park development. The market conditions and location of the project site make the site a less desirable location. Business park, as well as other types of commercial/office development, is sensitive to optimum location, visibility, and accessibility.
3.8.2b	Maintain an inventory of residential lands that provides for a broad range of housing types including executive housing in both urban and rural settings, traditional single-family neighborhoods, middle to upper end attached housing products, and affordable housing. • Provide a balance between the types and extent of employment-generating lands planned within the City of Antioch with the types and intensity of lands planned for residential development. • Encourage businesses to locate and expand within Antioch through an aggressive economic development program that provides essential information to prospective developers and businesses, along with tangible incentive programs for new and expanding businesses.	The proposed General Plan Amendment would introduce a new housing type in the Sand Creek focus Area known as Small Lot Single-Family Detached housing (MLDR). MLDR would consist of residential lots smaller than 7,000 square feet. The anticipated population density for this land use type is fourteen (14) to eighteen (18) persons per acre developed with residential uses.
Land Use Element		
4.4.6.7b (b)	Sand Creek Focus Area development shall make a substantial commitment to employment-generating uses. Up to 280 acres are to be devoted to employment-generating uses within the areas shown for Business Park and Commercial/Open Space, in	Refer to Policy 3.8.2a discussion above.

Table 4.8-1
Antioch General Plan Policy Discussion

Policy		Project Consistency
	addition to the area shown as Mixed Use Medical Facility. Appropriate primary land uses within employment-generating areas include: • Administrative and Professional Offices • Research and Development • Light Manufacturing and Assembly • Hospital and related medical uses	
4.4.6.7b (k)	A maximum of 4,000 dwelling units may be constructed within the Sand Creek Focus Area. Appropriate density bonuses may be granted for development of age-restricted housing for seniors; however, such density bonuses may not exceed the total maximum of 4,000 dwelling units for the Sand Creek Focus Area.	The proposed project consists of single-family residential development, including up to 650 single-family residential units on approximately 127 acres. The remainder of the Sand Creek Focus Area of the General Plan is allotted 3,350 more dwelling units.
4.4.6.7b (l)	It is recognized that although the ultimate development yield for the Focus Area may be no higher than the 4,000 dwelling unit maximum, the actual development yield is not guaranteed by the General Plan, and could be substantially lower. The actual residential development yield of the Sand Creek Focus Area will depend on the nature and severity of biological, geologic, and other environmental constraints present within the Focus Area, including, but not limited to constraints posed by slopes and abandoned mines present within portions of the Focus Area; on appropriate design responses to such constraints, and on General Plan policies. Such policies include, and but are not limited to, identification of appropriate residential development types, public services and facilities performance standards, environmental policies aimed at protection of natural topography and environmental resources, policies intended to protect public health and safety, and implementation of the Resource Management Plan called for in Policy "t," below.	The proposed project consists of single-family residential development, including up to 650 single-family residential units on approximately 127 acres. The remainder of the Sand Creek Focus Area of the General Plan is allotted 3,350 more dwelling units.

Table 4.8-1
Antioch General Plan Policy Discussion

Policy		Project Consistency
4.4.6.7b (m)	As a means of expanding the range of housing choices available within Antioch, three types of "upscale" housing are to be provided, including Hillside Estate Housing, Executive Estate Housing, and Golf Course-Oriented Housing. Hillside Estate Housing consists of residential development within the hilly portions of the Focus Area that are designated for residential development. Appropriate land use types include Large Lot Residential. Within these areas, typical flat land roadway standards may be modified (e.g., narrower street sections, slower design speeds) to minimize required grading. Mass grading would not be permitted within this residential type. Rough grading would be limited to streets and building pad areas. Residential densities within Hillside Estate Areas are to be limited to one dwelling unit per gross developable acre (1 du/ac), with typical lot sizes ranging upward from 20,000 square feet. The anticipated population density for this land use type is up to four persons per developed acre. Included in this category is custom home development, wherein semi-improved lots are sold to individuals for construction of custom homes. Approximately 20 percent of Hillside Estate Housing should be devoted to custom home sites. Executive Estate Housing consists of large lot suburban subdivisions within the flatter portions of the Focus Area. Appropriate land use types include Large Lot Residential. Densities of Executive Housing areas would typically be 2 du/ac, with lot sizes ranging upward from 12,000 square feet. The anticipated population density for this land use type is up to eight persons per developed acre. Golf Course-Oriented Housing consists of residential dwelling	The proposed General Plan Amendment would introduce a new housing type in the Sand Creek focus Area of the General Plan known as Small Lot Single-Family Detached housing (MLDR). The proposed project includes 650 MLDR units. The proposed project is proposed to be a "gated" community with a private club house and amenities.

Table 4.8-1
Antioch General Plan Policy Discussion

Policy		Project Consistency
	units fronting on a golf course to be constructed within the portion of the Focus Area identified as Golf Course/Senior Housing/Open Space in Figure 4.8 of the General Plan. Appropriate land use types include single-family detached and small Lot single-family detached for lots fronting on the golf course. Maximum densities for golf course-oriented housing would typically be 4 du/ac, with lot sizes as small as 5,000 square feet for lots actually fronting on the golf course. Given the significant environmental topographic constraints in the portion of the focus area west of Empire Mine Road, the minimum lot size for executive estate housing within this area shall be a minimum of 10,000 square feet. This would allow additional development flexibility in situations where executive estate housing needs to be clustered in order to preserve existing natural features. In no case shall the 10,000 square foot minimum lot size constitute more than 20 percent of the total number of executive estate housing units in the area west of Empire Mine Road. The anticipated population density for this land use type is up to eight to twelve persons per acre developed with residential uses. Should the City determine as part of the development review process that development of a golf course within the area having this designation would be infeasible, provision of an alternative open space program may be permitted, provided, however, that the overall density of lands designated Golf Course/Senior Housing/Open Space not be greater than would have occurred with development of a golf course.	
4.4.6.7b (n)	Single-Family Detached housing within suburban-style subdivisions with lot sizes ranging from 7,000 square feet to 10,000 square feet may also be developed within the Sand Creek Focus Area within areas shown as Residential and Low Density Residential in Figure 4.8 of the General Plan. The anticipated population density for this land use type is up to eight to twelve	The proposed General Plan Amendment would introduce a new housing type in the Sand Creek focus Area of the General Plan known as Small Lot Single-Family Detached housing (MLDR). MLDR would consist of residential lots smaller than 7,000 square feet. The proposed project includes development of up to 650 single-family residential units on approximately 127.5 acres north of the future alignment of Sand Creek

Table 4.8-1
Antioch General Plan Policy Discussion

Policy		Project Consistency
	persons per acre developed with residential uses.	Road. The anticipated population density for this land use type is fourteen (14) to eighteen (18) persons per acre developed with residential uses.
4.4.6.7b (p)	Age-restricted senior housing should be developed within the Focus Area as a means of expanding the range of housing choice within Antioch, while reducing the Focus Area's overall traffic and school impacts. Such senior housing may consist of single-family detached, small lot single-family detached, of multi-family attached housing, and may be developed in any of the residential areas of the Sand Creek Focus Area. Within areas identified in Figure 4.8 of the General Plan specifically for senior housing, limited areas of non-senior housing may be permitted where environmental or topographic constraints would limit development densities to a range more compatible with estate housing than with senior housing.	The proposed project is not proposed as an age-restricted senior housing development; however, the proposed project does not preclude senior housing. In addition, the proposed development includes small-lot residential homes with a community center and amenities within a "gated" community, which could attract senior residents.
4.4.6.7b (q)	Areas identified as Public/Quasi Public and School in Figure 4.8 of the Antioch General Plan are intended to identify locations for new public and institutional uses to serve the future development of the Sand Creek Focus Area. Development within these areas is to be consistent with the provisions of the Public/Institutional land use category described in Section 4.4.1.4 of the Land Use Element.	Should the Antioch City Council approve the proposed General Plan Amendment, the proposed project would change the P-QP land use designation to MLDR. The remainder of the Sand Creek Focus Area of the General Plan is currently includes P-QP and School General Plan land use designations. The P-QP designation located within the project site was previously operated by Shell Oil as an office and maintenance yard for petroleum pipeline operations. The Shell Oil office and maintenance yard has been removed from the site. The P-QP property is shown on the Development Plan as park open space.
4.4.6.7b (r)	Sand Creek, ridgelines, hilltops, stands of oak trees, and significant landforms shall be preserved in their natural condition. Overall, a minimum of 25 percent of the Sand Creek Focus Area shall be preserved in open space, exclusive of lands developed for golf course use.	The proposed project includes the construction of a detention basin south of the residential area and extension of the Sand Creek Trail, with the remaining acreage as undeveloped open space adjacent to the Sand Creek buffer area. In addition, the proposed project would include a focus on drought-tolerant and adaptive plant species. Approximately 25 percent of the site would be set aside for open space and buffer uses, consistent with General Plan Policy 4.4.6.7b (r).
4.4.6.7b (s)	Adequate buffer areas adjacent to the top of banks along Sand Creek to protect sensitive plant and amphibian habitats and water	The proposed project includes the construction of a detention basin south of the residential area and extension of the Sand Creek Trail, with the

Table 4.8-1
Antioch General Plan Policy Discussion

Policy		Project Consistency
	quality shall be provided. Adequate buffer areas shall also be provided along the edge of existing areas of permanently preserved open space adjacent to the Sand Creek Focus Area, including but not limited to the Black Diamond Mines Regional Park. Buffers established adjacent to existing open space areas shall be of an adequate width to minimize light/glare, noise, fire safety, public safety, habitat, public access impacts within the existing open space areas, consistent with the provisions of Section 10.5, Open Space Transitions and Buffers Policies of the General Plan.	remaining acreage as undeveloped open space adjacent to the Sand Creek buffer area. In addition, the proposed project would include a focus on drought-tolerant and adaptive plant species. Approximately 25 percent of the site would be set aside for open space and buffer uses, consistent with General Plan Policy 4.4.6.7b (s).
4.4.6.7b (t)	Because of the sensitivity of the habitat areas within the Sand Creek Focus Area, and to provide for mitigation of biological resources impacts on lands in natural open space, as well as for the long-term management of natural open space, a Resource Management Plan based on the Framework Resource Management Plan attached as Appendix A to this General Plan shall be prepared and approved prior to development of the Sand Creek Focus Area.	The applicant has prepared a Resource Management Plan for city approval as specific by this policy.
4.4.6.7b (w)	To mitigate the impacts of habitat that will be lost to future development within the Focus Area, an appropriate amount of habitat shall be preserved on- or off-site per the compensatory provisions of the Framework Resource Management Plan prepared for the Sand Creek Focus Area (attached as Appendix A of the General Plan).	Compensatory mitigation has been required as mitigation for impacts to biological resources. (See Mitigation Measure 4.3-2 in the Biological Resources chapter of this EIR).
4.4.6.7b (dd)	Project entry, streetscape, and landscape design elements are to be designed to create and maintain a strong identification of the Sand Creek Focus Area as an identifiable "community" distinct from Southeast Antioch.	The proposed project would be a gated community surrounded by masonry walls and include two separated gated entries, located on Heidorn Ranch Road and Hillcrest Avenue. In addition, both gated entries include a landscaped promenade, which leads to the 2.1-acre central park.
4.4.6.7b (ee)	The Sand Creek Focus Area is intended to be "transit-friendly," including appropriate provisions for public transit and non-motorized forms of transportation.	The proposed project includes the extension of Sand Creek Road, which would serve as the major east to west arterial through the Sand Creek Focus Area of the General Plan, and would provide the opportunity for public transit and non-motorized forms of transportation.

Table 4.8-1
Antioch General Plan Policy Discussion

Policy	Project Consistency
4.4.6.7b (gg) A park program, providing active and passive recreational opportunities is to be provided. In addition to a golf course and preservation of natural open space within Sand Creek and the steeper portions of the Focus Area, the development shall meet the City's established park standards. A sports complex is to be developed. A sports complex is to be developed. The sports complex is intended to be located within the Flood Control District's detention basin. Neighborhood park facilities may be privately maintained for the exclusive use of project residents. The sports complex within the Sand Creek Detention Basin will be maintained by the City.	The proposed project includes the development of recreational, park, and landscape areas within the residential area. The proposed project would include the construction of a detention basin south of the residential area and extension of the Sand Creek Trail, with the remaining acreage as undeveloped open space adjacent to the Sand Creek buffer area. In addition, the proposed project would include a focus on drought-tolerant and adaptive plant species. Approximately 25 percent of the site would be set aside for open space and buffer uses, as described in detail below: o *Promenade Central Park.* An approximate 2.1-acre park space would be located in the middle of the project site. Separate parking would also be provided if recreational facilities, such as a community building or pool were incorporated in the Promenade Central Park. o *Promenade Southeastern Park.* An approximate 7.5-acre park space with a 3.5-acre detention basin would be located in the southeastern corner of the project site. o *Sand Creek Regional Trail.* A segment of the Sand Creek Regional Trail would be constructed within the project site. The trail would connect to the planned trail to the west, by the Aviano Project, and would transition to the public sidewalk to the east along Sand Creek Road. o *Southern Detention Basin Surrounding Open Space.* Approximately 5.7 acres of open space would be included around and adjacent to the detention basin located south of Sand Creek Road. o *Landscaping.* Landscaping would be provided throughout the project site on a total of approximately 31.6 acres.
4.4.6.7b (hh) Development of an appropriate level of pedestrian and bicycle circulation throughout the community is to be provided, including pathways connecting the residential neighborhoods, as well as non-residential and recreational components of the community. Sand Creek Focus Area development should also provide recreational trail systems for jogging and bicycling,	The proposed project includes the extension of Heidorn Ranch Road, Hillcrest Avenue, and Sand Creek Road, and extension of a portion of the Sand Creek Trail for connection to other City and regional trails. In addition, the proposed project includes the construction of sidewalks on one side of the street on all streets throughout the development and provides linkages to adjoining projects to provide pedestrian and bicycle

Table 4.8-1 Antioch General Plan Policy Discussion		
Policy		**Project Consistency**
	including areas for hiking and mountain biking. Trails along Sand Creek and Horse Valley Creek shall be designed so as to avoid impacting sensitive plant and amphibian habitats, as well as water quality.	circulation throughout the community.
Community Image and Design Element		
5.4.12a	Minimize the number and extent of locations where nonresidential land use designations abut residential land use designations. Where such land use relationships cannot be avoided, strive to use roadways to separate the residential and non-residential uses.	The proposed residential development would be located adjacent to existing and planned residential to the north and west, with OS to the south and vacant land to the east. The vacant land to the east is designated MUPT within the City of Brentwood and would be separated by the arterial roadway Heidorn Ranch Road,
5.4.12b	Ensure that the design of new development proposed along a boundary between residential and non-residential uses provides sufficient protection and buffering for the residential use, while maintaining the development feasibility of the nonresidential use. The burden to provide buffers and transitions to achieve compatibility should generally be on the second use to be developed. Where there is bare ground to start from, both uses should participate in providing buffers along the boundary between them.	The proposed residential development would be located adjacent to existing and planned residential development to the north and west, with OS to the south and vacant land located in the City of Brentwood to the east. In addition, the proposed project would be a gated community surrounded by masonry walls.

4.8-5 Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance ("Farmland"), or 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. Based on the analysis below, the project would have *no impact.*

The CEQA checklist defines Farmland to include Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. The entire project site is made up of Farmland of Local Importance. Therefore, development of the proposed project would not result in conversion of any such lands, and the project would have ***no impact.***

Mitigation Measure(s)
None required.

4.8-6 Conflict with agricultural zoning or a Williamson Act contract. Based on the analysis below, the project would have *no impact.*

As noted previously, the entire project site is not under a Williamson Act contract. In addition, the project site is not zoned for agricultural uses. Therefore, development of the proposed project would not conflict with agricultural zoning or a Williamson Act contract, and the project would have ***no impact.***

Mitigation Measure(s)
None required.

4.8-7 Conflict with forest land or timberland zoning, or result in the loss of forest land or conversion of forest land to non-forest use. Based on the analysis below, the project would have *no impact.*

As noted previously, the entire project site is not zoned for forest land or timberland uses. Therefore, development of the proposed project would not conflict with forest land or timberland zoning, and the project would have ***no impact.***

Mitigation Measure(s)
None required.

4.8-8 Induce substantial population growth. Based on the analysis below, the impact is *less than significant.*

Based on 650 single-family dwelling units and the City average of 3.15 persons per household, based on the 2010 Census, the proposed project could provide housing for up to approximately 2,048 people (3.15 persons per household x 650 total dwelling units = 2,048 people), which represents a worst-case scenario.

As noted previously, Antioch's population increased by approximately 13 percent between the years 2000 and 2010, from 90,532 residents to 102,372 residents. According

to the U.S. Census Bureau, Contra Costa County's population has increased at a similar pace, growing by approximately 10 percent from 2000 to 2010, from 948,816 to 1,049,025. ABAG estimates that the City's population will be 112,700 in 2020. Assuming that the proposed project would be fully built out and operating at full capacity by 2020, the project's contribution to the overall population increase by 2020 would be approximately 1.8 percent, and would not contribute to an increase above the anticipated population levels.

In order to ensure that population growth does not outpace availability of adequate infrastructure, the City has included a Growth Management Element as Chapter 3.0 of the City General Plan. The Growth Management Element outlines objectives and policies aimed to ensure that adequate infrastructure is available for buildout of the General Plan. The proposed project's impacts related to public services and utilities are discussed in further detail in Chapter 4.11, Public Services, Recreation, and Utilities, of this Draft EIR. As determined in Chapter 4.11, the proposed project's impacts related to public services and utilities would be less than significant with implementation of the required mitigation measures where appropriate.

Overall, the proposed project's increase in population would not be considered substantial, and impacts would be considered ***less than significant***.

Mitigation Measure(s)
None required.

4.8-9 Displace substantial existing housing or substantial numbers of people. Based on the analysis below, the impact is *less than significant*.

The project site consists of approximately 141.6 acres and is bounded by a residential subdivision to the north, Sand Creek to the south, Heidorn Ranch Road and City of Brentwood City limits to the east, and future Hillcrest Avenue extension and vacant residential land to the west. The project site is undeveloped farmland and the site has been historically used for agricultural purposes. Given the generally undeveloped state of the site and lack of existing on-site housing, the project would have a ***less-than-significant*** impact related to the displacement of substantial numbers of existing housing or people.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in combination with other proposed and pending projects in the region. Other proposed and pending projects in the region under the cumulative context would include buildout of the City's General Plan, as well as development of the most recent planned land uses within the vicinity of the project area.

4.8-10 Cumulative land use and planning incompatibilities. Based on the analysis below, the cumulative impact is *less than significant.*

The proposed project, along with reasonably foreseeable projects within the City of Antioch, would change the intensity of land uses within the geographic area that would be affected by the proposed project. The increased development associated with these projects would result in environmental impacts, such as traffic, air, and noise, which are analyzed in other technical chapters of this EIR.

As stated above, the 141.6-acre project site is designated BP, P-QP, and OS/SH and Zoned S. The proposed project includes a General Plan Amendment and rezone to MLDR and OS, respectively. Analysis by EPS has determined that the City currently has a significant amount of vacant land/buildings suitable for office and business park development/redevelopment that would meet the City's projected future employment needs.

Pending the approval of the General Plan Amendment, the MDP and the rezone, the project site would be designated Medium Low Density Residential and Open Space, and zoned P-D. As a result, the final authority for determination of consistency with the Antioch General Plan and zoning rests with the Antioch City Council. Given the land use controls, Antioch General Plan objectives and policies, and development standards presently in use within Antioch and proposed by the project's PD standards and Development Agreement, the project's contribution to cumulative land use impacts would be minimized to a level that is considered ***less than significant***.

Mitigation Measure(s)
None required.

4.8-11 Cumulative loss of agricultural land. Based on the analysis below, the impact is *less than significant.*

As discussed above in Impact 4.8-5, the project site is not considered Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. In addition, the proposed project site is not zoned or designated for agricultural use. Therefore, the proposed project would not contribute to the cumulative loss of Important Farmland in the region.

The Antioch General Plan EIR analyzed impacts to agricultural resources associated with the buildout of the entire General Plan. Section 5.3.1 of the Antioch General Plan EIR concluded that the General Plan update would result in the conversion of agricultural land and open space lands to a variety of urban uses. The General Plan EIR also concluded that implementation of proposed General Plan policies and mitigation measures would help reduce the impacts resulting from conversion of open lands (defined to include agricultural lands) to urban uses, but that the potential loss of such lands would remain a significant unavoidable cumulative impact. However, insofar as that discussion address

loss of Farmland, it pertained to the Roddy Ranch and Ginnochio Focus Areas. The proposed project is not located in these areas.

Development of the proposed project in combination with other proposed and pending projects in the region associated with buildout of the Antioch General Plan could result in impacts associated with the conversion of farmland or other agricultural land (as noted in the General Plan EIR). However, because the proposed project would not result in the conversion of agricultural land to non-agricultural uses beyond that anticipated within the Antioch General Plan EIR, the project's incremental contribution to the cumulative loss of agricultural land would be considered ***less than significant***.

Mitigation Measure(s)
None required.

4.8-12 Cumulative population and housing impacts. Based on the analysis below, the impact is *less than significant.*

The Antioch General Plan enables residential growth, and identifies the necessary infrastructure improvements, including roads, utilities, and government services that would support future growth. Specifically, the Antioch General Plan planned for open space, residential, business park, commercial, and mixed-use development at the project site. The new residences provided by the proposed project would fall within ABAG's growth estimates for the City of Antioch.

The direct and indirect impacts of population and housing growth on the project site are considered throughout this EIR and include potential impacts to traffic, air quality, noise, the provision of public services and utilities, and other resource areas. To the extent that the projected population would result in significant adverse effects to such resources, the impacts have been identified and considered within relevant sections of this EIR.

Because the population from the proposed project has been anticipated by the various utilities and public service providers and other agencies that rely on ABAG's population projections for anticipating future impacts on various services. As a result, the increase in housing and population facilitated by the proposed project would not be considered to result in a significant incremental contribution to the cumulative impact on population, housing, or employment growth, and the proposed project's cumulative impacts related to population and housing would be considered ***less than significant***.

Mitigation Measure(s)
None required.

Endnotes

[1] City of Antioch. *City of Antioch General Plan*. Updated November 24, 2003.
[2] City of Antioch. *Draft General Plan Update Environmental Impact Report*. July 2003.
[3] City of Antioch. *City of Antioch, California Code of Ordinances.* June 24, 2014.
[4] City of Brentwood. *City of Brentwood General Plan*. June 2014.
[5] City of Brentwood. *Brentwood Municipal Code*. January 2015.
[6] California Department of Conservation, Division of Land Resource Protection, FMMP: *A Guide to the Farmland Mapping and Monitoring Program*. Available at: http://www.consrv.ca.gov/DLRP/fmmp/pubs/fmmp_guide_2004.pdf, 2004.
[7] California Department of Conservation, Division of Land Resources Protection, Land Conservation (Williamson) Act. *Map: "Contra Costa County Williamson Act FY 2012/2013."* Published 2013.
[8] Association of Bay Area Governments. *Projections 2009*. 2009. Available at: https://store.abag.ca.gov/projections.asp#26c.
[9] City of Antioch. About Antioch Police Department. Available at: http://www.ci.antioch.ca.us/CityGov/Police/. Accessed on March 9, 2015.
[10] United States Census Bureau. *Antioch (city), California Quickfacts*. Available at: http://quickfacts.census.gov. Accessed on March 10. 2015.
[11] City of Antioch. *City of Antioch General Plan EIR [pg. 4.11-1]*. July 2003.

4.9 NOISE

4.9 NOISE

4.9.1 INTRODUCTION

The Noise chapter of the EIR discusses the existing noise environment in the immediate project vicinity and identifies potential noise-related impacts and mitigation measures associated with the proposed project. Specifically, this chapter analyzes potential noise impacts due to and upon development within the project site relative to applicable noise criteria and to the existing ambient noise environment. Information presented in this chapter is primarily drawn from the *Environmental Noise Assessment* prepared specifically for the proposed project by j.c. brennan & associates, Inc. (see Appendix N)[1] and the *City of Antioch General Plan.*[2]

4.9.2 EXISTING ENVIRONMENTAL SETTING

The Existing Environmental Setting section provides a discussion of acoustical terminology, the effects of noise on people, existing sensitive receptors in the project vicinity, existing sources and noise levels in the project vicinity, and vibration.

Acoustical Terminology

Sound is the mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough, 20 times per second, they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second called Hertz (Hz). Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid awkwardness, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals or vibrations per second), as a point of reference, defined as zero dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. A strong correlation exists between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. Accordingly, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this Noise chapter

are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted. Because the decibel scale is logarithmic, when the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A-weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, the day/night average level (L_{dn}), and shows very good correlation with community response to noise. The L_{dn} is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 PM to 7:00 AM) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, short-term variations in the noise environment tend to get disguised.

Because sensitivity to noise increases during the evening and at night, due to excessive noise interfering with the ability to sleep, 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The Community Noise Equivalent Level (CNEL) is a measure of the cumulative noise exposure in a community, with a five dB penalty added to evening (7:00 PM to 10:00 PM) and a 10 dB addition to nocturnal (10:00 PM to 7:00 AM) noise levels. L_{dn} is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during 7:00 PM and 10:00 PM are grouped into the daytime period.

Table 4.9-1 provides a list of several examples of the noise levels associated with common activities.

Effects of Noise on People

The effects of noise on people can be placed in the following three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; or
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. A completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction does not exist. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way the new noise environment compares to the existing environment to which one has adapted (i.e., the ambient

noise level). In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise would be judged by those hearing the noise.

Table 4.9-1
Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-Over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. November, 2009.[3]

With regard to increases in A-weighted noise levels, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of one dB cannot be perceived;
- Outside of the laboratory, a three dB change is considered a barely perceivable difference;
- A change in level of at least five dB is required before any noticeable change in human response would be expected; and
- A 10 dB change is subjectively heard as approximately a doubling in loudness, and would typically cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately six dB per doubling of distance from the source, depending on environmental conditions (i.e., atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

Existing Sensitive Receptors

Certain land uses are more sensitive to noise levels than others due to the amount of noise exposure (in terms of both exposure time and shielding from noise sources) and the type of activities typically involved. Residences, schools, libraries, churches, hospitals, nursing homes, auditoriums, parks, and outdoor recreation areas are generally more sensitive to noise than are commercial and industrial land uses. Accordingly, such land uses are referred to as sensitive receptors.

In the vicinity of the project site, sensitive land uses consist of rural residential uses located at varying distances around the project site. Specifically, the nearest sensitive residential receptor is located approximately 15 feet or further north of the northeastern property boundary along Heidorn Ranch Road.

Existing Ambient Noise Levels

To quantify the existing ambient noise environment in the project vicinity, short-term ambient noise level measurements and continuous (24-hour) noise level measurements were conducted at two locations on the project site on July 15 to July 16, 2014 (see Figure 4.9-1). The ambient noise levels measured are presented in Table 4.9-2. The maximum value (L_{max}) represents the highest noise level measured during the interval. The average value (L_{eq}) represents the energy average of all of the noise measured during the interval. The median value (L_{50}) represents the sound level exceeded 50 percent of the time during the interval.

Table 4.9-2
Summary of Existing Background Noise Measurement Data

Site	Location	Date	CNEL	Average Measured Hourly Noise Levels (dBA)								
				Daytime (7:00AM–7:00PM)			Evening (7:00PM–10:00PM)			Nighttime (10:00PM–7:00AM)		
				L_{eq}	L_{50}	L_{max}	L_{eq}	L_{50}	L_{max}	L_{eq}	L_{50}	L_{max}
Continuous 24-Hour Noise Measurement Sites												
A	North center of project on property line	July 15 to July 16, 2014	49	46	42	61	41	39	56	41	40	54
B	Northeast corner on property line	July 15 to July 16, 2014	52	46	43	60	43	40	55	46	41	59
Short-Term Noise Measurement Sites												
1	West center on property line	July 16, 2014	N/A	51	46	66	Measurement taken @ 3:58 PM					
2	East center on property line	July 16, 2014	N/A	51	46	61	Measurement taken @ 4:29 PM					

Source: j.c. brennan & associates, Inc., Environmental Noise Assessment, January 20, 2015.

Figure 4.9-1
Noise Measurement Locations

Source: j.c. brennan & associates, Inc., Environmental Noise Assessment, January 20, 2015.

Existing Roadway Noise Levels

Table 4.9-3 shows the existing traffic noise levels in terms of CNEL at the closest typical residential outdoor use area along each roadway segment. The distances reported in Table 4.9-3 are generally considered to be conservative estimates of noise exposure along the project-area roadways. It should be noted that the contour distances include a -5 dB offset for roadway segments that predominately include noise barriers at residential areas. In some locations sensitive receptors may not receive full shielding from noise barriers, or may be located at distances which vary from the assumed calculation distance. However, the traffic noise analysis is representative of the majority of sensitive receptors located closest to the project area roadway segments analyzed in the noise report.

Table 4.9-3
Existing Traffic Noise Levels and Distances to Contours

Roadway	Segment	Typical Setback Distance (feet)	Exterior Noise Level (dBA CNEL)[2]	Distance to Noise Contours (CNEL)[1]		
				70 dB	65 dB	60 dB
Lone Tree Way	West of Deer Valley Rd.	80	61.9	23	50	108
Lone Tree Way	Deer Valley Rd. to Hillcrest Dr.	80	62.3	24	53	113
Lone Tree Way	Hillcrest Ave. to Heidorn Ranch Rd.	80	63.0	27	59	126
Lone Tree Way	Heidorn Ranch Rd. to Canada Valley Rd.	80	63.0	27	59	127
Lone Tree Way	Canada Valley Rd. to SR 4 EB Ramps[3]	80	64.5	35	74	160
Lone Tree Way	East of SR 4 WB Ramps[4]	80	64.3	33	72	155
Deer Valley Rd.	North of Lone Tree Way	65	60.3	15	32	68
Deer Valley Rd.	South of Lone Tree Way	90	59.1	17	36	78
Hillcrest Ave.	North of Lone Tree Way	75	59.5	15	32	70
Hillcrest Ave.	South of Lone Tree Way	75	53.1	6	12	26
Heidorn Ranch Rd.	South of Lone Tree Way	100	48.0	3	7	16
Sand Creek Rd.	West of Hillcrest Ave.	75	N/A	N/A	N/A	N/A
Sand Creek Rd.	Hillcrest Ave. to Heidorn Ranch Rd.	75	N/A	N/A	N/A	N/A
Sand Creek Rd.	Heidorn Ranch Rd. to SR 4 EB Ramps	75	N/A	N/A	N/A	N/A
Sand Creek Rd.	East of SR 4 WB Ramps	75	62.3	23	49	106

Notes:
[1] Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
[2] Traffic noise levels may vary depending on actual setback distances and localized shielding.
[3] SR = State Route, EB = eastbound
[4] WB = westbound

Source: j.c. brennan & associates, Inc., Environmental Noise Assessment, January 20, 2015.

Vibration

While vibration is similar to noise, both involving a source, a transmission path, and a receiver, vibration differs from noise because noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception

to the vibration depends on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second (in/sec p.p.v.). Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

4.9.3 REGULATORY CONTEXT

In order to limit exposure to damaging noise levels, the State of California, various county governments, and most municipalities in the State have established standards and ordinances to control noise. The following provides a general overview of the existing State, and local regulations established regarding noise that are relevant to the proposed project.

State Regulations

The following are the State environmental laws and policies relevant to noise.

California State Building Codes

The State Building Code, Title 24, Part 2 of the State of California Code of Regulations establishes uniform minimum noise insulation performance standards to protect persons within new buildings that house people, including hotels, motels, dormitories, apartment houses, and dwellings other than single-family dwellings. Title 24 mandates that interior noise levels attributable to exterior sources shall not exceed 45 dB L_{dn} or CNEL in any habitable room. Title 24 also mandates that for structures containing noise-sensitive uses to be located where the L_{dn} or CNEL exceeds 60 dB, an acoustical analysis must be prepared to identify mechanisms for limiting exterior noise to the prescribed allowable interior levels. If the interior allowable noise levels are met by requiring that windows be kept closed, the design for the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment.

Local Regulations

The following are the City of Antioch's environmental policies relevant to noise.

City of Antioch General Plan

The Environmental Hazards chapter of the City of Antioch General Plan sets forth noise and land use compatibility standards to guide development, as well as noise goals and policies to protect citizens from the harmful and annoying effects of excessive noise. The following noise objectives and policies are applicable to the proposed project.

Noise Compatible Land Use and Circulation Patterns

Objective 11.6.1 Achieve and maintain exterior noise levels appropriate to planned land uses throughout Antioch as described below:

- Residential:
  - Single-Family: 60 dBA CNEL within rear yards
  - Multi-Family: 60 dBA CNEL within exterior open space
- Schools
  - Classrooms: 65 dBA CNEL
  - Play and sports areas: 70 dBA CNEL
- Hospitals, Libraries: 60 dBA CNEL
- Commercial/Industrial: 70 dBA CNEL at the front setback

Policy 11.6.2.a Implementation of the noise objective contained in Section 11.6.1 and the policies contained in 11.6.2 of the Environmental Hazards Element shall be based on noise data contained in Section 4.9 of the General Plan EIR, unless a noise analysis conducted pursuant to the City's development and environmental review process provides more up-to-date and accurate noise predictions, as determined by the City.

Policy 11.6.2.b Maintain a pattern of land uses that separates noise-sensitive land uses from major noise sources to the extent possible, and guide noise-tolerant land uses into the noisier portions of the Planning Area.

Noise Analysis and Mitigation

Policy 11.6.2.e When new development incorporating a potentially significant noise generator is proposed, require noise analyses to be prepared by a qualified acoustical engineer. Require the implementation of appropriate noise mitigation when the proposed project will cause new exceedances of General Plan noise objectives, or an audible (3.0 dBA) increase in noise in areas where General Plan noise objectives are already exceeded as the result of existing development.

Policy 11.6.2.f In reviewing noise impacts, utilize site design and architectural design features to the extent feasible to mitigate impacts on residential neighborhoods and other uses that are sensitive to noise. In addition to sound barriers, design techniques to mitigate noise impacts may include, but are not limited to:

- Increased building setbacks to increase the distance between the noise source and sensitive receptor.
- Orient buildings which are compatible with higher noise levels adjacent to noise generators or in clusters to shield more noise sensitive areas and uses.
- Orient delivery, loading docks, and outdoor work areas away from noise sensitive uses.
- Place noise tolerant use, such as parking areas, and noise tolerant structures, such as garages, between the noise source and sensitive receptor.
- Cluster office, commercial, or multifamily residential structures to reduce noise levels within interior open space areas.
- Provide double glazed and double paned windows on the side of the structure facing a major noise source, and place entries away from the noise source to the extent possible.

Policy 11.6.2.g Where feasible, require the use of noise barriers (walls, berms, or a combination thereof) to reduce significant noise impacts.

- The barrier must have sufficient mass to reduce noise transmission and high enough to shield the receptor from the noise source.
- To be effective, the barrier needs to be constructed without cracks or openings.
- The barrier must interrupt the line-of-sight between the noise source and the receptor.
- The effects of noise "flanking" the noise barrier should be minimized by bending the end of the barrier back from the noise source.
- Require appropriate landscaping treatment to be provided in conjunction with noise barriers to mitigate their potential aesthetic impacts.

Policy 11.6.2.h Continue enforcement of California Noise Insulation Standards (Title 25, Section 1092, California Administration Code).

Temporary Construction

Policy 11.6.2.i Ensure that construction activities are regulated as to hours of operation in order to avoid or mitigate noise impacts on adjacent noise-sensitive land uses.

Policy 11.6.2.j Require proposed development adjacent to occupied noise sensitive land uses to implement a construction-related noise mitigation plan. This plan would depict the location of construction equipment storage and maintenance areas, and document methods to be employed to minimize noise impacts on adjacent noise sensitive land uses.

Policy 11.6.2.k Require that all construction equipment utilize noise reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

Policy 11.6.2.m Prior to the issuance of any grading plans, the City shall condition approval of subdivisions and non-residential development adjacent to any developed/occupied noise sensitive land uses by requiring applicants to submit a construction-related noise mitigation plan to the City for review and approval. The plan should depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of the project through the use of such methods as:

- The construction contractor shall use temporary noise-attenuation fences, where feasible, to reduce construction noise impacts on adjacent noise sensitive land uses.
- During all project site excavation and grading on-site, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receptors

nearest the project site during all project construction.

- The construction contractor shall limit all construction-related activities that would result in high noise levels to between the hours of 7:00 AM and 7:00 PM Monday through Saturday. No construction shall be allowed on Sundays and public holidays.

Policy 11.6.2.n The construction-related noise mitigation plan required shall also specify that haul truck deliveries be subject to the same hours specified for construction equipment. Additionally, the plan shall denote any construction traffic haul routes where heavy trucks would exceed 100 daily trips (counting those both to and from the construction site). To the extent feasible, the plan shall denote haul routes that do not pass sensitive land uses or residential dwellings. Lastly, the construction-related noise mitigation plan shall incorporate any other restrictions imposed by the City.

City of Antioch Code of Ordinance

The noise standards contained in the City of Antioch Code of Ordinance are provided below.

Zoning

9-5.1901 Noise Attenuation Requirements

A. Stationary noise sources. Uses adjacent to outdoor living areas (e.g., backyards for single-family homes and patios for multi-family units) and parks shall not cause an increase in background ambient noise which will exceed 60 CNEL.

B. Mobile noise sources. Arterial and street traffic shall not cause an increase in background ambient noise which will exceed 60 CNEL.

D. Noise attenuation. The City may require noise attenuation measures be incorporated into a project to obtain compliance with this section. Measures outlined in the noise policies of the General Plan should be utilized to mitigate noise to the maximum feasible extent.

Disturbing the Peace

5-17.04 Heavy Construction Equipment Noise

A. It shall be unlawful for any person to be involved in construction activity during the hours specified below:

B. It shall be unlawful for any person to be involved in construction activity during the hours specified below:
   - On weekdays prior to 7:00 AM and after 6:00 PM.
   - On weekdays within 300 feet of occupied dwellings, prior to 8:00 AM and after 5:00 PM.
   - On weekends and holidays, prior to 9:00 AM and after 5:00 PM, irrespective of the distance from the occupied dwellings.

4.9.4 IMPACTS AND MITIGATION MEASURES

This section describes the standards of significance and methodology utilized to analyze and determine the proposed project's potential impacts related to noise and vibration.

Standards of Significance

Consistent with Appendix G of the CEQA Guidelines, the City's General Plan, and professional judgment, a significant impact would occur if the proposed project would result in the following:

- Exposure of persons to, or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Specifically, 60 dB CNEL in exterior residential rear yard areas and 45 dB CNEL in interior residential areas;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Specifically, a limit of 0.1 in/sec p.p.v., as discussed below;
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. Specifically, an audible (3.0 dBA) increase in noise in areas where General Plan noise objectives are already exceeded as the result of existing development;[4]
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity. Specifically, an audible (3.0 dBA) increase in noise in areas where General Plan noise objectives are already exceeded as the result of existing development. A substantial temporary or periodic increase in ambient noise levels does not include construction noise which is exempt under the City's Zoning Ordinance during specific hours;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels within two miles of a public airport or public use airport; or
- For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

Method of Analysis

Below are descriptions of the methodologies utilized to determine traffic noise, railroad noise, operational noise, construction noise and vibration, and railroad vibration impacts. Further modeling details and calculations are provided in the *Environmental Noise Assessment* (see

Appendix L). The results of the noise and vibration impact analyses were compared to the standards of significance discussed above in order to determine the associated level of impact.

Traffic Noise

To predict existing noise levels due to traffic, the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (RD-77-108) was used. The FHWA model is based upon the noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions. To predict L_{dn}/CNEL values, determination of the day/night distribution of traffic and adjustment of the traffic volume input data is necessary to yield an equivalent hourly traffic volume. Traffic volumes for existing conditions were obtained from the traffic study prepared for the project (Fehr & Peers). Truck percentages and vehicle speeds on the local area roadways were estimated from field observations.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segment. A conservative adjustment of -5 dB is assumed where noise barriers are located adjacent to sensitive receptors or where rear yards are shielded by intervening buildings. In some locations sensitive receptors may be located at distances which vary from the assumed calculation distance and may experience shielding from intervening barriers or sound walls. However, the traffic noise analysis is believed to be representative of the majority of sensitive receptors located closest to the project-area roadway segments analyzed.

The current version of the Vineyards at Sand Creek Traffic Study, which is incorporated into the Transportation and Circulation chapter of this EIR, assumes that, under Existing Plus Project conditions, access to the project site would be provided from Heidorn Ranch Road and Hillcrest Avenue. The Vineyards at Sand Creek Traffic Study originally assumed that project access would only be available from Heidorn Ranch Road. The noise modeling conducted for the project is based upon the original traffic analysis assumptions. J.c. brennan and associates has confirmed that their noise analysis for the proposed project represents a worst-case, conservative analysis because the analysis is based upon the assumption that all project traffic would travel to and from the site via Heidorn Ranch Road, rather than being distributed amongst Heidorn Ranch Road and Hillcrest Avenue.[1]

Construction Noise and Vibration

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 4.9-4 summarizes the effects of vibration on people and buildings. Table 4.9-4 indicates that the threshold for damage to structures ranges from two to six in/sec p.p.v. One-half this minimum threshold, or one in/sec p.p.v., is considered a safe criterion that would protect against architectural or structural damage. The general threshold at

[1] j.c. brennan & associates. *Vineyards at Sand Creek Revised Traffic Study and Effect on Predicted Traffic Noise Levels.* December 22, 2014.

which human annoyance could occur is noted as 0.1 in/sec p.p.v. Construction noise and vibration was analyzed using data compiled for various pieces of construction equipment at distances of 25 feet, 50 feet, and 100 feet.

Table 4.9-4
Effects of Vibration on People and Buildings

Peak Particle Velocity		Human Reaction	Effect on Buildings
inches/second	mm/second		
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: Caltrans. Transportation Related Earthborne Vibrations. TAV-02-01-R9601. February 20, 2002.[5]

Project-Specific Impacts and Mitigation Measures

The following discussion of noise impacts is based on implementation of the proposed project in comparison to existing conditions and the standards of significance presented above.

4.9-1 Aircraft noise. Based on the analysis below, the project would have *no impact.*

The project area is not located within the vicinity of a public airport or a private airstrip and is not within an airport land use plan. The nearest airport to the project site is the Byron Airport, located approximately 11.0 miles southeast of the site. Therefore, the proposed project would not be exposed to excessive air traffic noise, and ***no impact*** would occur as a result of the proposed project.

Mitigation Measure(s)
None required.

4.9-2 Impacts related to a substantial temporary or periodic increase in ambient noise levels in the project vicinity. Based on the analysis below and with implementation of mitigation, the impact would be *less than significant.*

The project includes construction of homes, roads, water and sewer lines, and related infrastructure, all of which would add to the noise environment in the project vicinity. The total length of construction is anticipated to be seven years.

Table 4.9-5 summarizes typical construction equipment noise at a distance of 50 feet. As shown in Table 4.9-5, activities involved in construction would generate maximum noise levels ranging from 76 to 90 dB at a distance of 50 feet.

Table 4.9-5
Construction Equipment Noise

Type of Equipment	Predicted Noise Levels (L_{max} dB)				Distances to Noise Contours (feet)	
	Noise Level at 50 feet	Noise Level at 100 feet	Noise Level at 200 feet	Noise Level at 400 feet	70 dB L_{max} Contour	65 dB L_{max} Contour
Backhoe	78	72	66	60	126	223
Compactor	83	77	71	65	223	397
Compressor (air)	78	72	66	60	126	223
Concrete Saw	90	84	78	72	500	889
Dozer	82	76	70	64	199	354
Dump Truck	76	70	64	58	100	177
Excavator	81	75	69	63	177	315
Generator	81	75	69	63	177	315
Jackhammer	89	83	77	71	446	792
Pneumatic Tools	85	79	73	67	281	500

Source: Roadway Construction Noise Model User's Guide. Federal Highway Administration. FHWA-HEP-05-054. January 2006.

Noise would also be generated during the construction phase by increased truck traffic on area roadways. In addition, project-generated construction noise would include traffic associated with transport of heavy materials and equipment to and from the construction sites.

The nearest sensitive residential receptor is located approximately 15 feet or further north of the northeastern property boundary along Heidorn Ranch Road. Construction activities associated with the proposed project would typically occur at distances between 15 and 1,800 feet from the noise-sensitive receptors off Heidorn Ranch Road. In addition, some finish grading may occur near the northern boundary of the project site, adjacent to existing single-family homes. The aforementioned finish grading activities could occur within approximately 15 to 20 feet of the existing residences to the north. However, overall site grading activities would be expected to occur for no more than three to five weeks total for the proposed project. Therefore, the duration of grading that would occur within close proximity to the existing single-family homes would be substantially less than three to five weeks.

Noise would also be generated during the construction phase by increased truck traffic on area roadways. Project-generated construction noise would include traffic associated with transport of heavy materials and equipment to and from construction sites. The noise increase would be of short duration, and would likely occur primarily during daytime hours.

Ultimately, construction noise would be exempt from the City's noise standards, per Section 5-17.04 of the City's Zoning Code and any elevated noise levels would be temporary in nature. However, because the nearest sensitive receptor may experience periods of elevated construction noise, mitigation measures shall be employed to alleviate the potential impacts from construction noise.

Construction activities would be temporary in nature, would occur during normal daytime working hours, and would be exempt from noise regulation during the hours listed above. Implementation of the proposed project would not expose persons to or generate excessive groundborne noise levels. However, existing nearby sensitive receptors to the north of the project site may be subject to ***potentially significant*** temporary noise impacts if construction occurs outside normal daytime hours.

Mitigation Measure(s)
Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

4.9-2(a) *Noise-generating activities at the construction site or in areas adjacent to the construction site that are associated with the proposed project in any way shall adhere to the requirements of the City of Antioch Zoning Ordinance with respect to hours of operations, subject to review and approval by the City Building Official. Specifically, construction activities shall not occur during the hours specified below:*

- *On weekdays prior to 7:00 AM and after 6:00 PM;*
- *On weekdays within 300 feet of occupied dwellings, prior to 8:00 AM and after 5:00 PM; and*
- *On weekends and holidays, prior to 9:00 AM and after 5:00 PM, irrespective of the distance from the occupied dwellings.*

4.9-2(b) *Prior to issuance of the grading permit, the project contractor shall ensure that all intake and exhaust ports on power construction equipment shall be shrouded or shielded from sensitive receptors according to industry best practices, subject to review and approval by the City Building Official.*

4.9-2(c) *Prior to issuance of the grading permit, the project contractor shall designate a disturbance coordinator and conspicuously post the coordinator's number around the project site and in adjacent public spaces, subject to review and approval by the City Building Official. The*

disturbance coordinator shall receive any and all public complaints about construction noise disturbances and shall be responsible for determining the cause of the complaint and implementing any feasible measures to be taken to alleviate the problem.

4.9-2(d) *Prior to the issuance of the grading permit, the applicants shall submit a construction-related noise mitigation plan to the City Building Official for review and approval. The plan shall depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of the project through the use of such methods as:*

- *The construction contractor shall use temporary noise-attenuation fences, where feasible, to reduce construction noise impacts on adjacent noise sensitive land uses.*
- *During all project site excavation and grading on-site, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.*
- *The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.*

4.9-3 Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Based on the analysis below, the impact is *less than significant.*

As noted above, the project includes construction of homes, roads, water and sewer lines, and related infrastructure. The total length of construction is anticipated to be seven years.

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception (0.006 to 0.019 in/sec). Building damage could take the form of cosmetic or structural. Table 4.9-6 shows the typical vibration levels produced by construction equipment.

Table 4.9-6
Vibration Levels for Varying Construction Equipment

Type of Equipment	Peak Particle Velocity at 25 feet (inches/second)	Peak Particle Velocity at 50 feet (inches/second)	Peak Particle Velocity at 100 feet (inches/second)
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/roller	0.210	0.074	0.026

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2006.

Nearby existing sensitive receptors could be impacted by construction-related vibrations, especially vibratory compactors/rollers. However, the nearest receptors are located approximately 15 feet or further to the north from any areas of the project site that might require grading or paving. As shown in Table 4.9-6, construction vibration levels anticipated for the proposed project would be less than 0.1 in/sec at 50 feet. Accordingly, construction vibrations are not predicted to cause damage to existing buildings or cause annoyance to sensitive receptors and implementation of the proposed project would not expose persons to or generate excessive groundborne vibration levels. Therefore, construction-related vibration impacts would be considered ***less than significant***.

Mitigation Measure(s)
None required.

4.9-4 Transportation noise at existing sensitive receptors. Based on the analysis below, the impact is *less than significant.*

Vehicle trips associated with operation of the proposed project would result in changes to traffic on the existing roadway network within the project vicinity. As a result, project buildout would cause an increase in traffic noise levels on local roadways. To assess noise impacts due to project-related traffic increases on the existing local roadway network, noise levels have been calculated for the Existing Plus Project and the Near Term Plus Project traffic conditions.

Traffic noise levels were predicted at the closest typical residential outdoor use area along each project-area roadway segment. A conservative adjustment of -5 dB is assumed where noise barriers are located adjacent to sensitive receptors or where rear yards are shielded by intervening buildings. In some locations, sensitive receptors may not receive full shielding from noise barriers, or may be located at distances which vary from the assumed calculation distance. However, the traffic noise analysis is considered

representative of the majority of sensitive receptors located closest to the project area roadway segments analyzed in the noise report.

The actual distances to noise level contours may vary from the distances predicted by the FHWA model due to roadway curvature, grade, shielding from local topography or structures, elevated roadways, or elevated receivers. Table 4.9-7 shows the Existing condition traffic noise levels and the increase in noise levels for the Existing Plus Project condition. Table 4.9-8 shows the Near Term condition traffic noise levels and the increase in noise levels for the Near Term Plus Project condition.

The distances reported in Tables 4.9-9 and 4.9-10 are generally considered to be conservative estimates of noise exposure along the project-area roadways. Table 4.9-7 and Table 4.9-8 indicate that some noise sensitive receptors located along the project-area roadways are currently exposed to exterior traffic noise levels exceeding the City of Antioch 60 dB CNEL exterior noise level standard for residential uses. The aforementioned receptors will continue to experience elevated exterior noise levels with implementation of the proposed project. However, the project is not predicted to cause any new exceedances of the City's 60 dB CNEL exterior noise level standard.

As shown in Table 4.9-7, the noise level increases resulting from development of the proposed project are predicted to range between 0.1 to 5.5 dB for the Existing Plus Project condition. The predicted noise level increase of 5.5 dB at Heidorn Ranch Road south of Lone Tree Way would result in an overall noise level exposure of 55.0 dB CNEL in rear yard areas. The aforementioned noise level is less than the City's 60 dB CNEL exterior noise level standard. Additionally, the projected increases would not cause any audible (3.0 dBA) increases in noise in areas where General Plan noise objectives are already exceeded as a result of existing development.

As shown in Table 4.9-8, the noise level increases resulting from development of the proposed project are predicted to range between 0.1 dB to 3.2 dB for the Near Term Plus Project condition. The predicted noise level increase of 3.2 dB at Heidorn Ranch Road south of Lone Tree Way would result in an overall noise level exposure of 53.9 dB CNEL in rear yard areas. The aforementioned noise level is less than the City's 60 dB CNEL exterior noise level standard. Therefore, the increase would not cause an audible (3.0 dBA) increase in noise in areas where General Plan noise objectives are already exceeded as a result of existing development.

The resulting changes in noise levels in both the Existing Plus Project and the Near Term Plus Project conditions are below the City's exterior noise level standard. For noise levels that reach above the exterior noise level standard, the increase would be below the three dBA threshold before any noticeable change in human response would be expected. Therefore, traffic-related noise impacts to existing sensitive receptors would be considered ***less than significant***.

Mitigation Measure(s)
None required.

Table 4.9-7
Existing and Existing Plus Project Traffic Noise Levels

Roadway	Segment	Traffic Noise Levels CNEL (dBA)[2]				Distance to Noise Level Contours (feet)[1]					
						Existing (CNEL)			Existing Plus Project (CNEL)		
		Typical Setback Distance (feet)	Existing	Existing Plus Project	Change	70 dB	65 dB	60 dB	70 dB	65 dB	60 dB
Lone Tree Way	West of Deer Valley Rd.	80	61.9	62.2	0.2	23	50	108	24	52	111
Lone Tree Way	Deer Valley Rd. to Hillcrest Dr.	80	62.3	62.6	0.3	24	53	113	26	55	119
Lone Tree Way	Hillcrest Ave. to Heidorn Ranch Rd.	80	63.0	63.4	0.5	27	59	126	29	63	136
Lone Tree Way	Heidorn Ranch Rd. to Canada Valley Rd.	80	63.0	63.7	0.7	27	59	127	30	65	141
Lone Tree Way	Canada Valley Rd. to SR 4 EB Ramps	80	64.5	65.0	0.5	35	74	160	37	80	173
Lone Tree Way	East of SR 4 WB Ramps	80	64.3	64.4	0.1	33	72	155	34	73	157
Deer Valley Rd.	North of Lone Tree Way	65	60.3	60.5	0.1	15	32	68	15	32	70
Deer Valley Rd.	South of Lone Tree Way	90	59.1	59.2	0.1	17	36	78	17	37	80
Hillcrest Ave.	North of Lone Tree Way	75	59.5	59.9	0.4	15	32	70	16	34	74
Hillcrest Ave.	South of Lone Tree Way	75	53.1	53.1	0.0	6.0	12	26	6.0	12	26
Heidorn Ranch Rd.	South of Lone Tree Way	100	49.5	55.0	5.5	4.0	9.0	20	10	22	47
Sand Creek Rd.	West of Hillcrest Ave.	75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sand Creek Rd.	Hillcrest Ave. to Heidorn Ranch Rd.	75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sand Creek Rd.	Heidorn Ranch Rd. to SR 4 EB Ramps	75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sand Creek Rd.	East of SR 4 WB Ramps	75	62.3	62.4	0.1	23	49	106	23	50	109

Notes:
[1] Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
[2] Traffic noise levels may vary depending on actual setback distances and localized shielding.

Source: j.c. brennan & associates, Inc., Environmental Noise Assessment, January 20, 2015.

Table 4.9-8
Near Term and Near Term Plus Project Traffic Noise Levels

Roadway	Segment	Traffic Noise Levels CNEL (dBA)[2]				Distance to Noise Level Contours (feet)[1]					
						Near Term (CNEL)			Near Term Plus Project (CNEL)		
		Typical Setback Distance (feet)	Near Term	Near Term Plus Project	Change	70 dB	65 dB	60 dB	70 dB	65 dB	60 dB
Lone Tree Way	West of Deer Valley Rd.	80	62.9	63.1	0.2	27	58	125	28	59	128
Lone Tree Way	Deer Valley Rd. to Hillcrest Dr.	80	63.1	63.7	0.6	28	60	129	30	66	141
Lone Tree Way	Hillcrest Ave. to Heidorn Ranch Rd.	80	64.3	64.5	0.2	33	72	155	34	74	159
Lone Tree Way	Heidorn Ranch Rd. to Canada Valley Rd.	80	64.5	65.0	0.5	34	74	159	37	79	171
Lone Tree Way	Canada Valley Rd. to SR 4 EB Ramps	80	65.7	66.1	0.4	42	90	193	44	95	204
Lone Tree Way	East of SR 4 WB Ramps	80	64.7	64.8	0.1	36	77	165	36	77	167
Deer Valley Rd.	North of Lone Tree Way	65	60.6	60.7	0.1	15	33	71	16	34	73
Deer Valley Rd.	South of Lone Tree Way	90	60.7	60.7	0.1	21	46	99	22	47	101
Hillcrest Ave.	North of Lone Tree Way	75	60.6	60.9	0.3	18	38	83	19	40	87
Hillcrest Ave.	South of Lone Tree Way	75	57.6	59.1	1.5	11	24	52	14	30	66
Heidorn Ranch Rd.	South of Lone Tree Way	100	50.7	53.9	3.2	5.0	11	24	8.0	18	39
Sand Creek Rd.	West of Hillcrest Ave.	75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sand Creek Rd.	Hillcrest Ave. to Heidorn Ranch Rd.	75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sand Creek Rd.	Heidorn Ranch Rd. to SR 4 EB Ramps	75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sand Creek Rd.	East of SR 4 WB Ramps	75	63.0	63.1	0.1	26	55	119	26	56	121

Notes:
[1] Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
[2] Traffic noise levels may vary depending on actual setback distances and localized shielding.

Source: j.c. brennan & associates, Inc., Environmental Noise Assessment, January 20, 2015.

4.9-5 Transportation noise at new sensitive receptors. Based on the analysis below and with implementation of mitigation, the impact would be *less than significant.*

The proposed project consists of development of approximately 650 single-family residential units on 127.5 acres; 31.6 acres of parks and landscaped areas; extension of Heidorn Ranch Road, Hillcrest Avenue, and Sand Creek Road; extension of a portion of the Sand Creek Trail for connection to other City and regional trails with associated parking; and utility improvements. The proposed sensitive receptors, including 650 residential units, would be exposed to traffic noise from vehicles traveling along existing and proposed roadways. Future existing and near term exterior and interior noise conditions at the project site and impacts on the residential land uses are discussed in detail below.

Exterior Traffic Noise Levels (Experienced at New On-Site Residences)

The FHWA traffic noise prediction model was used to predict Existing Plus Project and Near Term Plus Project traffic noise levels at the proposed residential land uses associated with the project under Existing Plus Project and Near Term Plus Project conditions. Table 4.9-9 shows the predicted traffic noise levels at the proposed residential uses adjacent to the major project-area arterial roadways. In addition, the table indicates the property line noise barrier heights required to achieve compliance with an exterior noise level standard of 60 dB L_{dn}.

Table 4.9-9
Transportation Noise Levels at Proposed On-Site Residential Uses

Noise Source	Receptor Description	Approximate Distances to Center of Outdoor Activity Area (feet)[1]	Average Daily Trips	Predicted Noise Levels (dB CNEL)[2]			
Traffic Noise				**No Wall**	**6 Foot Wall**	**7 Foot Wall**	**8 Foot Wall**
Existing Plus Project							
Hillcrest Ave.	Nearest Backyards	90	2,400	57	--	--	--
Heidorn Ranch Rd.	Nearest Backyards	120	9,070	60	--	--	--
Sand Creek Rd.	Nearest Backyards	90	N/A	N/A	--	--	--
Near Term Plus Project							
Hillcrest Ave.	Nearest Backyards	90	6,720	61	55	54	53
Heidorn Ranch Rd.	Nearest Backyards	120	7,030	59	--	--	--
Sand Creek Rd.	Nearest Backyards	90	N/A	N/A	--	--	--

Notes:
[1] Setback distances are measured in feet from the centerlines of the roadways to the center of residential backyards.
[2] The modeled noise barriers assume flat site conditions where roadway elevations, base of wall elevations, and building pad elevations are approximately equivalent.

Source: FHWA-RD-77-108 with inputs from Fehr & Peers and j.c. brennan & associates, Inc. January 20, 2015.

The data in Table 4.9-9 indicate that a noise barrier six feet in height would be sufficient to reduce exterior noise levels to 60 dB CNEL or less at the sensitive receptors located along Hillcrest Avenue. Because grading plans are not currently available, noise barrier height and placement shall be reviewed when such plans are available. Figure 4.9-2 shows recommended noise barrier locations. It should be noted that the figure shows a barrier along the north side of Sand Creek Road. Sand Creek Road would be extended during the cumulative horizon timeframe; therefore, traffic noise levels along the Sand Creek Road extension, and associated barrier, are addressed in the cumulative section of this chapter.

Interior Noise Levels

Modern construction typically provides a 25 dB exterior-to-interior noise level reduction with windows closed. Therefore, sensitive receptors exposed to exterior noise of 70 dB CNEL or less will typically comply with the City of Antioch 45 dB CNEL interior noise level standard. Additional noise reduction measures, such as acoustically-rated windows, are generally required for exterior noise levels exceeding 70 dB CNEL.

Exterior noise levels are typically two to three dB higher at second floor locations. Additionally, noise barriers do not reduce exterior noise levels at second floor locations. The proposed residential uses are predicted to be exposed to unmitigated first floor exterior traffic noise levels ranging between 60 to 67 dB CNEL. Therefore, second floor facades are predicted to be exposed to exterior traffic noise levels of up to 63 to 70 dB CNEL. Based upon a 25 dB exterior-to-interior noise level reduction, second floor interior traffic noise levels are predicted to range between 38 to 45 dB CNEL. Because the 25 dB exterior-to-interior noise level reduction assumes that all windows are closed, other means of ventilation would be required throughout the proposed homes required. Therefore, additional interior noise control measures would be required for traffic noise.

Conclusion

Because residential land uses proposed at the project site would be exposed to exterior and interior noise levels greater than the noise level standards presented in the City of Antioch General Plan without mitigation, noise impacts to proposed on-site sensitive receptors would be considered ***potentially significant***.

Figure 4.9-2
Noise Barrier Locations

Source: j.c. brennan & associates, Inc., Environmental Noise Assessment, January 20, 2015.

Mitigation Measure(s)
Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

4.9-5(a) *In conjunction with submittal of Improvement Plans, the applicant shall show on the Improvement Plans that sound walls and/or landscaped berms shall be constructed along Hillcrest Avenue and Sand Creek Road at proposed residential uses. The specific height and location of the noise barrier shall be confirmed based upon the final approved site and grading plans. See Figure 4.9-2 for the recommended noise barrier placement and required wall height. Wall height shown in the aforementioned figure is relative to building pad elevations. Noise barrier walls shall be constructed of concrete panels, concrete masonry units, earthen berms, or any combination of these materials. Wood is not recommended due to eventual warping and degradation of acoustical performance. The Improvement Plans shall be subject to review and approval by the City Engineer.*

4.9-5(b) *In conjunction with submittal of Building Plans, the applicant shall show on the plans that mechanical ventilation shall be installed in all residential uses to allow residents to keep doors and windows closed, as desired for acoustical isolation. The building plans shall be subject to review and approval by the City Building Official.*

4.9-6 Operational noise from activities on-site post development. Based on the analysis below, the impact is *less than significant.*

The proposed project includes lots for park uses. Future development of public park uses on the project site could cause exterior noise levels to exceed the City's operational noise level standards at new residential receptors located near the proposed park parcels.

Children playing at neighborhood parks or outdoor recreational fields (softball, soccer, basketball, tennis) are often considered potentially significant noise sources which could adversely affect adjacent noise-sensitive land uses. Typical noise levels associated with groups of approximately 50 children playing at a distance of 50 feet generally range from 55 to 60 dB L_{eq} and 70 to 75 dB L_{max}. Park and school activities are expected to occur during daytime (7:00 AM to 7:00 PM) or evening (7:00 PM to 10:00 PM) hours. The CNEL due to park activities would be approximately 59 dB CNEL at 50 feet.

Based upon the project site plan, the center of the proposed park areas would be located approximately 180 feet or further from the nearest residential receptors. At a distance of 180 feet, the exterior noise level due to park activities is predicted to be approximately 48 dB CNEL, which would comply with the City's 60 dB CNEL exterior noise level standard. Therefore, park and playground-related noise levels would be less than 60 dB CNEL, and impacts related to operational noise are considered ***less than significant***.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in combination with other proposed and pending projects in the City as well as buildout of the City's General Plan.

4.9-7 Cumulative impacts on noise-sensitive receptors. Based on the analysis below and with implementation of mitigation, the project's contribution to a cumulative impact would be *less than significant*.

The cumulative context for noise impacts associated with the proposed project would consist of the existing and future noise sources that could affect the project or surrounding uses. Noise generated by construction would be temporary, and would not add to the permanent noise environment or be considered as part of the cumulative context. Cumulative noise impacts would occur primarily as a result of increased traffic on local roadways due to the proposed project and on-site activities resulting from operation of the proposed project.

Cumulative Traffic Noise

Vehicle trips associated with operation of the proposed project would result in changes to traffic on the existing roadway network within the project vicinity. As a result, project buildout would cause an increase in traffic noise levels on local roadways. To assess noise impacts due to project-related traffic increases on the existing local roadway network in addition to other traffic, noise levels have been calculated for the Cumulative Plus Project traffic condition. Table 4.9-10 shows the Cumulative condition traffic noise levels and the increase in noise levels for the Cumulative Plus Project condition.

Future cumulative traffic noise conditions at the project site and impacts on the existing and proposed sensitive receptors are discussed in detail below.

Existing Sensitive Receptors

As shown in Table 4.9-10, cumulative traffic noise would exceed City standards at off-site sensitive receptor locations without the proposed project. When proposed project traffic noise is added to the Cumulative condition, the noise levels increase by as much as 1.1 dB. The predicted noise level increase of 1.1 dB at Heidorn Ranch Road, south of Lone Tree Way, would result in an overall noise level exposure of 53.0 dB CNEL in rear yard areas. The aforementioned noise level is less than the City's 60 dB CNEL exterior noise level standard. Additionally, the increase would not cause an audible (3.0 dBA) increase in noise in areas where General Plan noise objectives are already exceeded as the result of existing development. Therefore, although some areas may result in total noise

levels that exceed the City's standard for exterior noise levels, the project's incremental contribution to traffic noise levels would be less than cumulatively considerable.

Future Sensitive Receptors

The proposed sensitive receptors consisting of 650 single-family residential units, would be exposed to traffic noise generated by vehicles travelling along existing and proposed roadways. Table 4.9-11 shows the transportation noise levels the the proposed residential uses in the Cumulative Plus Project condition. As shown in Table 4.9-11, noise barriers six to seven feet in height would be required to reduce exterior noise levels to 60 dB CNEL or less at proposed sensitive receptors located along Hillcrest Avenue and Sand Creek Road. With the noise barriers, the anticipated exterior noise level at the backyards of the proposed residences would be well below the City of Antioch 60 dB CNEL exterior noise level standard.

Conclusion

Cumulative noise levels at the closest sensitive receptors without the proposed project would exceed City standards at many locations. Because the increase in noise levels associated with implementation of the proposed project would not cause an audible (3.0 dBA) increase in noise in areas where General Plan noise objectives are already exceeded as the result of existing development, the total noise increase associated with the proposed project would be considered a less-than-significant incremental increase to the future noise environment. In addition, at the locations not already exceeding noise standards, the addition of proposed project noise would not increase noise to levels that would exceed City standards. However, because noise attenuation measures would be required for the proposed sensitive residential receptors along Hillcrest Avenue and Sand Creek Road, the cumulative noise impact would be considered ***potentially significant*** without mitigation.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

4.9-7 Implement Mitigation Measures 4.9-5(a) and 4.9-5(b).

Table 4.9-10
Cumulative and Cumulative Plus Project Traffic Noise Levels

Roadway	Segment	Traffic Noise Levels CNEL (dBA)[2]				Distance to Noise Level Contours (feet)[1]					
						Cumulative (CNEL)			Cumulative Plus Project (CNEL)		
		Typical Setback Distance (feet)	Cumulative	Cumulative Plus Project	Change	70 dB	65 dB	60 dB	70 dB	65 dB	60 dB
Lone Tree Way	West of Deer Valley Rd.	80	63.1	63.4	0.3	28	60	128	29	63	135
Lone Tree Way	Deer Valley Rd. to Hillcrest Dr.	80	64.1	64.2	0.1	32	70	151	33	71	153
Lone Tree Way	Hillcrest Ave. to Heidorn Ranch Rd.	80	64.7	64.7	0.1	35	76	163	36	77	165
Lone Tree Way	Heidorn Ranch Rd. to Canada Valley Rd.	80	64.9	65.0	0.1	37	79	169	37	80	172
Lone Tree Way	Canada Valley Rd. to SR 4 EB Ramps	80	65.9	66.0	0.1	43	92	198	43	93	200
Lone Tree Way	East of SR 4 WB Ramps	80	65.6	65.6	0.1	41	87	188	41	88	190
Deer Valley Rd.	North of Lone Tree Way	65	62.7	62.8	0.1	21	46	98	21	46	99
Deer Valley Rd.	South of Lone Tree Way	90	61.6	61.7	0.1	25	53	114	25	54	116
Hillcrest Ave.	North of Lone Tree Way	75	61.2	61.5	0.3	19	42	90	20	44	94
Hillcrest Ave.	South of Lone Tree Way	75	58.2	58.9	0.7	12	26	57	14	29	63
Heidorn Ranch Rd.	South of Lone Tree Way	100	51.9	53.0	1.1	6.0	13	29	7.0	16	34
Sand Creek Rd.	West of Hillcrest Ave.	75	63.3	63.4	0.2	27	57	124	27	59	127
Sand Creek Rd.	Hillcrest Ave. to Heidorn Ranch Rd.	75	63.4	63.6	0.2	27	59	127	28	61	131
Sand Creek Rd.	Heidorn Ranch Rd. to SR 4 EB Ramps	75	63.6	64.0	0.5	28	60	130	30	65	139
Sand Creek Rd.	East of SR 4 WB Ramps	75	64.2	64.3	0.1	31	66	142	31	67	144

Notes:
[1] Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
[2] Traffic noise levels may vary depending on actual setback distances and localized shielding.

Source: j.c. brennan & associates, Inc., Environmental Noise Assessment, January 20, 2015.

Table 4.9-11
Transportation Noise Levels at Proposed Residential Uses

Noise Source	Receptor Description	Approximate Distances to Center of Outdoor Activity Area (feet)[1]	Average Daily Trips	Predicted Noise Levels (dB CNEL)[2]			
Traffic Noise				**No Wall**	**6 Foot Wall**	**7 Foot Wall**	**8 Foot Wall**
Cumulative Plus Project							
Hillcrest Ave.	Nearest Backyards	90	9,020	63	57	56	54
Heidorn Ranch Rd.	Nearest Backyards	120	5,670	60	--	--	--
Sand Creek Rd.	Nearest Backyards	90	26,740	67	61	60	59

Notes:
[1] Setback distances are measured in feet from the centerlines of the roadways to the center of residential backyards.
[2] The modeled noise barriers assume flat site conditions where roadway elevations, base of wall elevations, and building pad elevations are approximately equivalent.

Source: FHWA-RD-77-108 with inputs from Fehr & Peers and j.c. brennan & associates, Inc. January 20, 2015.

Endnotes

[1] j.c. brennan & associates, Inc. *Environmental Noise Assessment, Vineyards at Sand Creek EIR*. January 20, 2015.
[2] City of Antioch. *City of Antioch General Plan*. Updated November 24, 2003.
[3] Caltrans. *Technical Noise Supplement, Traffic Noise Analysis Protocol.* November 2009.
[4] City of Antioch. *City of Antioch General Plan*. Updated November 24, 2003. Page 11-10.
[5] Caltrans. *Transportation Related Earthborne Vibrations.* TAV-02-01-R9601. February 20, 2002

4.10 PUBLIC SERVICES, RECREATION, AND UTILITIES

4.10 PUBLIC SERVICES, RECREATION, AND UTILITIES

4.10.1 INTRODUCTION

The Public Services, Recreation and Utilities chapter of this EIR summarizes setting information and identifies potential new demands resulting from the Vineyards at Sand Creek Project (proposed project) on water supply, wastewater systems, solid waste disposal, law enforcement, fire protection, schools, parks and recreation, and energy utilities. Information for this chapter was drawn from project information provided by the *Water Supply Assessment for Vineyards at Sand Creek* (see Appendix M),[1] the *City of Antioch General Plan*[2] and associated EIR,[3] the City of Antioch *Water System Master Plan Update*,[4] the *City of Antioch 2010 Urban Water Management Plan*,[5] the Delta Diablo *Conveyance System Master Plan Update*,[6] and information from local service providers.

4.10.2 EXISTING ENVIRONMENTAL SETTING

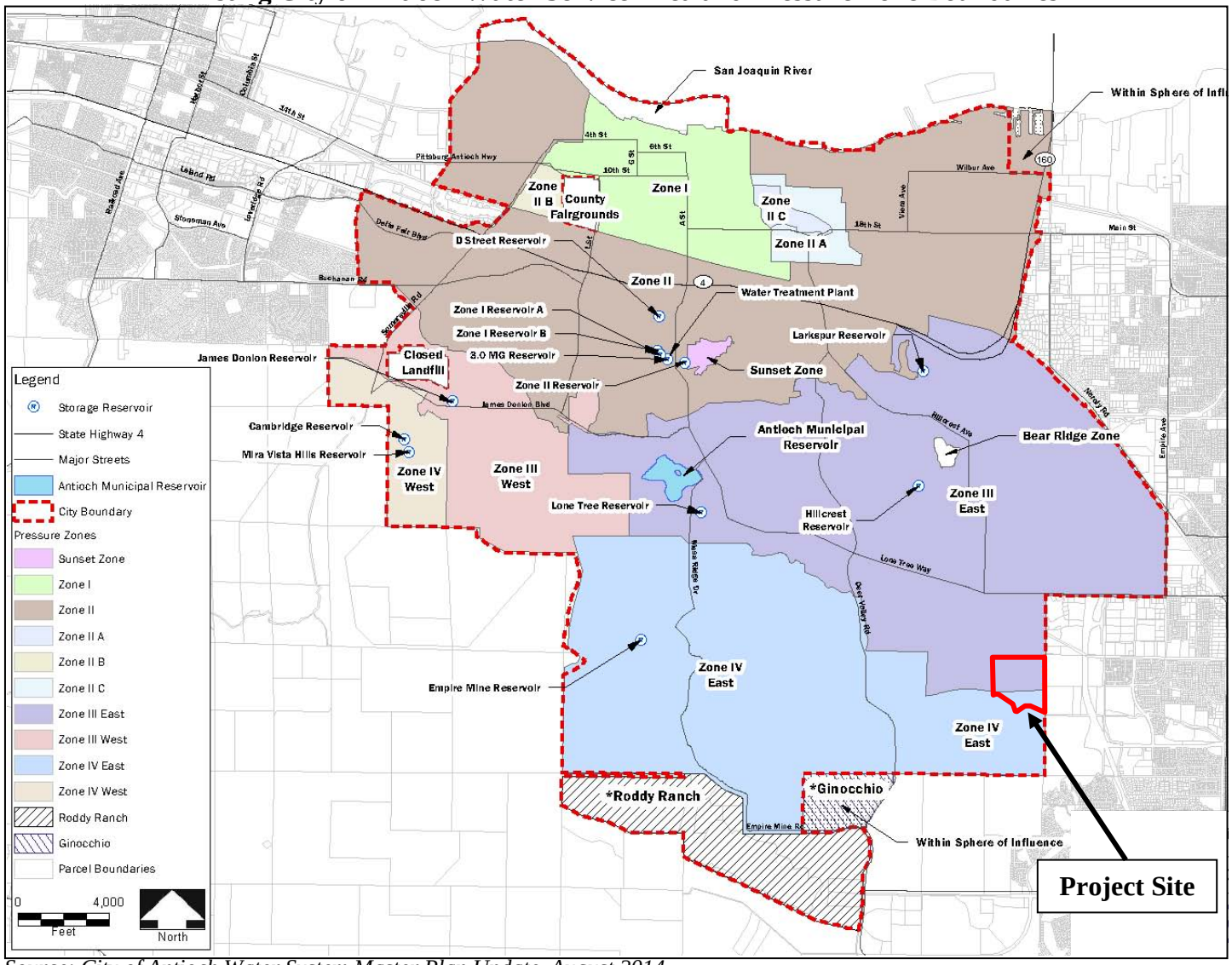
The following section describes the existing utilities, including water supply, wastewater collection and treatment, solid waste, fire protection and law enforcement services, school and library services, parks and recreation facilities, and electricity and natural gas in the project area.

Water Supply

As shown on Figure 4.10-1, the proposed project site is currently located inside the existing Antioch city limits, which is serviced by the City of Antioch's water system. The existing City of Antioch water service area covers 28.8 square miles and includes the area within the city limits and some adjacent Contra Costa County (CCC) land to the northeast and the west. The Antioch water system serves approximately 17,492 acre-feet of water to over 30,688 connections.[7] The service area extends from steep hilly terrain in the south and west portions of the service area to flat with a gentle slope in the northeast portion of the service area. Elevations in the service area range from sea level to over 700 feet. Generally, the service area is limited to elevations less than 560 feet. Four pressure zones are currently required to distribute water, and eventually six to seven pressure zones may be necessary depending on future land development.

The principal sources of raw water supply are the Sacramento/San Joaquin Rivers Delta and the Contra Costa Canal. Raw water from the Contra Costa Canal can also be stored in the Antioch Municipal Reservoir. Contra Costa Canal water, purchased from the Contra Costa Water District (CCWD), is pumped from Victoria Canal, Rock Slough, and Old River in the western delta.

Figure 4.10-1
Existing City of Antioch Water Service Area and Pressure Zone Boundaries



Source: City of Antioch Water System Master Plan Update. August 2014.

City of Antioch's Water Demand

The City of Antioch's 2010 Urban Water Management Plan (UWMP) describes the projected City water demand through 2030 (see Table 4.10-1).

Table 4.10-1
City of Antioch Historical and Projected Total Water Use, AFY[1]

Sectors	Actual 2005	Actual 2010	2015	2020	2025	2030	2035
Single Family Residential	15,135	11,262	14,669	12,813	13,189	13,459	13,727
Multi-Family Residential	1,459	1,246	1,450	1,333	1,330	1,327	1,324
Commercial	1,389	1,294	1,816	1,878	2,008	2,295	2,582
Industrial	962	736	795	752	760	777	794
Institutional & Governmental	-	-	-	-	-	-	-
Landscape	1,022	1,871	1,969	1,948	1,916	1,863	1,810
Other	2116	572	826	967	1,070	1,182	1,294
Total Water Deliveries	20,110	16,981	21,525	19,692	20,273	20,902	21,531
Raw Water	375	336	-	-	-	-	-
Recycled Water	-	-	487	1,000	1,500	1,500	1,500
Unaccounted-for System Losses (approximately 3%)	624	526	666	609	627	646	665
Total	**21,109**	**17,843**	**22,678**	**21,301**	**22,400**	**23,048**	**23,696**

Notes:
AFY = Acre-feet per year
1. Based on City's 2010 UWMP, Tables 3-5 through 3-9, 3-13, and 3-15 for 2005 through 2030. Data for 2035 projected from 2030 data.

Source: West Yost, 2015.

As seen in Table 4.10-1, the City's metered water use for 2010 was 16,981 acre-feet per year (AFY), which was a 15.6 percent reduction from the 2005 metered water use of 20,110 AFY. The recent economic downturn was the biggest factor in the decrease in water demand. As the economy improves, the water demand is expected to increase. The water demand projections provided in the City's 2010 UWMP were based on population and employment projections and the Senate Bill (SB) x7-7 per capita water demand targets adopted by the City.

City of Antioch's Water Supply

The City's 2010 UWMP describes the City's available water supplies which include surface water purchased from CCWD and delivered through the Contra Costa Canal, and surface water

pumped from the City's Sacramento/San Joaquin Rivers Delta intakes. A small (735 acre-foot) municipal reservoir located within City limits stores water pumped from the Contra Costa Canal. Surface water is conveyed to the City's water treatment plant, treated, and then conveyed via the City's potable water distribution system. Recycled water is not currently a water supply source for the City, but is projected to be delivered from Delta Diablo in the near future.[8] The City of Antioch's current and projected water supplies are shown in Table 4.10-2.

Table 4.10-2
City of Antioch Normal Year Water Supplies – Current and Projected, AFY[1]

Water Supply Sources	Actual 2010	2015	2020	2025	2030	2035
CCWD Surface Water	17,843	22,678	21,301	22,400	23,048	23,697
Sacramento/San Joaquin Rivers Delta	7,550	7,550	7,550	7,550	7,550	7,550
Municipal Reservoir	380	380	380	380	380	380
Recycled Water from Delta Diablo	-	487	1,500	1,500	1,500	1,500
Total	**25,733**	**31,095**	**30,231**	**31,830**	**32,478**	**33,127**

Notes:
CCWD = Contra Costa Water District
Delta Diablo

Source: West Yost, 2015.

Surface Water

The City of Antioch is within the CCWD service area and purchases Central Valley Project (CVP) water pumped from the Sacramento/San Joaquin Rivers Delta by CCWD. The CCWD has a contract with the U.S. Bureau of Reclamation (USBR) for 195,000 AFY of CVP water. In May 2005, CCWD renewed their water service contract with the USBR for a period of 40 years through February 2045.

In 2010, approximately 70 percent of the City's water supply was provided by CCWD. The City and CCWD have a contractual arrangement allowing the City to obtain such quantity of water as is necessary to meet 100 percent of the City's needs, subject to rationing restrictions in the event of drought or other extraordinary circumstances. CCWD's future supply projections indicate adequate availability of surface water sources delivered through the contract with the USBR, other available sources, and short-term purchases under normal conditions.

The remaining approximately 30 percent of the City's water supply in 2010 was obtained from the City's intakes on the Sacramento/San Joaquin Rivers Delta intakes. The City does not have quantity limitation on the appropriation from the Sacramento/San Joaquin Rivers Delta, provided the water is put to beneficial use, which includes water diverted to the City's municipal reservoir.

The projected water supplies from CCWD are not anticipated to incur supply deficits in normal years due to CCWD's long-term conservation program, existing CVP contract supply, and long-term water transfer agreement with East Contra Costa Irrigation District (ECCID). CCWD's currently available and planned supplies are sufficient to meet their reliability goals and estimated water demands during normal, single dry and the first two years of a multi-year drought. In later years, several types of drought conditions may result in supply shortfalls.

The City typically ceases diverting water from the Sacramento/San Joaquin Rivers Delta when the chloride concentration of the water exceeds 250 milligrams per liter (mg/l), which occurs occasionally during dry years. According to the WSA prepared specifically for the proposed project, the City has assumed pumping from the Sacramento/San Joaquin Rivers Delta would be available in normal and wetter precipitation years, during a single year drought, and in the first year of a multiple-year drought, but would not be available in the second and third years of a multiple year drought. A summary of the City's projected water supply during Normal, Single Dry, and Multiple-Dry Years is shown in Table 4.10-3.

Table 4.10-3
Summary of Projected Water Supply During Hydrologic Normal, Single-Dry, and Multiple-Dry Years for City of Antioch, AFY[1]

Hydrologic Condition	2015	2020	2025	2030	2035
Normal Year	31,095	30,231	31,830	32,478	33,127
Single Dry Year[2]	31,095	30,231	31,606	31,557	31,942
Multiple-Dry Year – First Year[3]	31,095	30,231	31,830	32,478	33,127
Multiple-Dry Year – Second Year[3]	21,165	22,301	23,676	23,627	24,012
Multiple-Dry Year – Third Year[3]	21,351	20,597	21,212	21,091	21,642

Notes:
1. From City's 2010 UWMP Table 5-8, 5-9, and 5-10 for 2015 through 2030 (corrected). Calculated values based on assumptions below.
2. CCWD anticipates the following supply shortfalls in a single-year drought: 2015, (0%), 2020 (0%), 2025 (1%), 2030 (4%), 2035 (5%). City assumes all local water supplies and intakes would be available in a single-year drought.
3. CCWD anticipates the following supply shortfalls in a three-year drought scenario: 2015 (0%, 0%, 8%), 2020 (0%, 0%,8%), 2025 (0%,1%,12%), 2030 (0%,4%,15%), 2035 (0%,5%,15%). City assumes the municipal reservoir and the Delta intakes would be available only in the first year of a multi-year drought. Recycled water is assumed to be available under all hydrologic conditions.

Source: West Yost, 2015.

Groundwater

The City does not currently pump groundwater, and does not have plans to pump groundwater from the local groundwater basin in the future.[9]

Water Treatment Plant

The City of Antioch Water Treatment Plant (WTP) is located at 401 Putnam Street in the City of Antioch. The WTP treats raw water and delivers safe potable water to residential, industrial, commercial, and irrigation customers. The pipelines from the Contra Costa Canal to the WTP have a capacity over 60 million gallons per day (mgd), well above the maximum predicted future water demand.[10] The California Department of Public Health (CDPH) requires that river water must be first pumped to the municipal reservoir before going to the WTP. The WTP has a maximum capacity of about 38 mgd. Treated water flows into two 1.0 million-gallon (MG) clearwells before entering the distribution system.

Wastewater Collection and Treatment

The City maintains and owns the local sewage collection system and is responsible for the collection and conveyance of wastewater to the Delta Diablo Wastewater Treatment Plant (WWTP). Delta Diablo owns and operates the regional interceptors and wastewater treatment plant. The project site is located within the Delta Diablo service area. As proposed, the City of Antioch is responsible for the wastewater collection system from the project site to the designated Delta Diablo regional wastewater conveyance facility. The regional conveyance facilities transport wastewater to the WWTP located at 2500 Pittsburg-Antioch Highway, Antioch. After secondary treatment, the effluent would either be discharged through a deep-water outfall to New York Slough, or further processed through the Delta Diablo's Recycled Water Facility (RWF) to tertiary Title 22 recycled water standards and distributed for reuse.

Regional conveyance facilities transport wastewater to the WWTP. After secondary treatment, the effluent is either discharged through a deep-water outfall to New York Slough or further processed through the RWF. The WWTP National Pollutant Discharge Elimination System (NPDES) Permit allows an average dry weather flow of 16.5 mgd. An EIR for the expansion of the wastewater treatment plant capacity to an average dry weather flow of 22.7 mgd was completed in April 1988. During the most recent reporting period, 2012, the average dry weather flow influent to the treatment plant was 12.7 mgd. In 2000 and 2005, the average dry weather flow influent to the treatment plant was 13.5 mgd and 14.2 mgd, respectively.[11]

Solid Waste

Allied Waste provides solid waste collection, disposal, recycling, and yard waste services to the City of Antioch. Solid waste and recyclables from the City are taken to the Contra Costa Transfer and Recovery Station in Martinez, which has a permitted disposal capacity of 1,900 tons per day.[12] Solid waste is transferred from the Transfer and Recovery Station to the Keller Canyon Landfill located at 901 Bailey Road in Pittsburg. The Keller Canyon Landfill site is 1,399 acres, 244 of which comprise the actual current disposal acreage. The landfill is permitted to accept 3,500 tons of waste per day and has a total estimated permitted capacity of approximately 75 million cubic yards, with only approximately 11.5 million cubic yards (16 percent of total capacity) used to date.[13]

Fire Protection

The entirety of the Vineyards at Sand Creek project site is currently within the service boundaries of the Contra Costa County Fire Protection District (CCCFPD). The CCCFPD boundaries encompass the central and northern portions of CCC, extending from the City of Antioch in the east to the eastern border of the City of Richmond in the west, and as far south as the northern border of the City of Moraga. The CCCFPD has a boundary area of approximately 257 square miles. The CCCFPD provides fire suppression (structural, vehicle, and vegetation fires) and prevention, Advanced Life Support (ALS) for medical emergencies, rescue, dispatch, initial hazardous materials response, fire inspection, plan review, and education.

The CCCFPD has four (4) fire stations within the City of Antioch that could provide fire protection services to the project site. The station numbers, addresses, and distances to the project site are shown in Table 4.10-4. Each fire station is staffed with three (3) personnel 24 hours a day. A 24-hour shift includes one (1) Captain, one (1) Engineer, and one (1) firefighter.

Table 4.10-4
CCCFPD Fire Stations Serving the Project Site

Station Number	Address	Distance to Project Site
Station 81	315 W. 10th Street, Antioch	4.8 miles
Station 82	196 Bluerock Drive, Antioch	2.8 miles
Station 83	2717 Gentrytown Drive, Antioch	5.2 miles
Station 88	4288 Folsom Drive, Antioch	2.1 miles

Source: Mr. Ted Leach, Fire Inspector, Contra Costa County Fire Protection District, December 5, 2012.

In 2011, the CCCFPD received a total of 41,457 emergency and non-emergency calls for service. The CCCFPD's current response time goal for emergency and non-emergency calls is five (5) minutes to 90 percent of all calls received. According to CCCFPD, actual response times vary; however, the average CCCFPD response time, as of December 2012, is approximately 6 minutes and 36 seconds.[14] In addition to the existing stations, a new station located at Deer Valley Road and Sand Creek Road, approximately one mile west of the project site, is planned. However, the timing of construction of the station is unknown.

The Insurance Service Office (ISO), an advisory organization, classifies fire service in communities from 1 to 10, indicating the general adequacy of coverage. Communities with the best systems for water distribution, fire department facilities, equipment and personnel and fire alarms and communications, receive a rating of one. CCCFPD has a current ISO rating of 3.

Law Enforcement

The Antioch Police Department (PD) is responsible for providing law enforcement services within the City of Antioch. The Antioch PD operates out of the police headquarters at 300 L Street, and is currently budgeted for 124 sworn and 59 non-sworn employees.[15]

The Antioch Police Department consists of the following two divisions:

- *Field Services Division*: The Field Services Division responds to calls for service, and patrols the City to detect and deter criminal activity. This Division consists of the following bureaus: Patrol; Community Policing; Traffic; Communications; and Resources, Education, Apprehension, and Prevention (REAP) officers assigned to schools.
- *Support Services Division*: The Support Services Division augments patrol functions through administrative and clerical support; provides detectives to investigate person, property, and narcotics offenses; and provides services related to the care, control, and protection of animals at the City-operated animal shelter. This Division consists of the following bureaus: Investigations; Narcotics; Records; Administration; and Animal Services.

According to the current Antioch General Plan EIR, population growth has created an increased demand for police-related services, and consequently a need for additional Antioch PD staff. The City of Antioch General Plan establishes a goal for the Antioch PD staffing ratio to be between 1.20 to 1.50 officers per 1,000 residents.[16] The City of Antioch's current population is 107,100,[17] which results in an Antioch PD staffing ratio of approximately 1.0 per 1,000 residents.

Antioch PD divides the City into six beats by geographical area. The beats are as follows:

- Beat 1: northwestern area;
- Beat 2: northeastern area;
- Beat 3: western and southwestern area;
- Beat 4: southern area;
- Beat 5: southeastern area; and
- Beat 6: southeastern area.

The project site is served by Beats 5 and 6.

The Antioch Police Department assigns a priority number to every call for service. Calls are classified in the following manner:

- *Priority 1:* designates in-progress crimes or life-threatening situations.
- *Priority 2:* designates calls that demand immediate attention, but are not crimes in progress or life-threatening.
- *Priority 3:* designates those calls that do not require immediate response and could be dealt with as soon as is practical.

It should be noted the City of Antioch currently does not have an Antioch PD response time goal requirement for emergency calls.

Schools

The project site is located within the Brentwood Union School District (BUSD) and the Liberty Union High School District (LUHSD). The BUSD consists of eight elementary schools and three middle schools. In 2013 the District had a K-6 grade enrollment of 6,345 with a K-6 grade capacity of 6,800. The District's 2013 7-8 grade enrollment is 2,081 with a 7-8 grade capacity of 1,940.[18] Therefore, the District has excess capacity for another 455 K-6th students, but is over capacity for grades 7-8th by approximately 141 students.

The LUHSD includes three comprehensive high schools: Liberty High, Freedom High, and Heritage High. In addition, the District includes one continuation high school, La Paloma, and one alternative high school, Independence High School. According to the LUHSD, all three comprehensive high school sites were built with a 2,200 student capacity, which is currently being exceeded at all three high schools and facility needs are being met with portables.[19]

The LUHSD and BUSD student generation rates per household are shown in Table 4.10-5.

Table 4.10-5
Student Generation Rates

Grade Levels	Student Generation Factor per Household
Brentwood Union High School District	
K-6	0.402
7-8	0.118
Liberty Union High School District	
9-12	0.2074

Source:
- *School Facility Needs Analysis for Brentwood Union School District. July 23, 2013.*
- *Personal communication with Debra Fogarty, Chief Business Officer, Liberty Union High School District. November 12, 2013.*

Parks and Recreation

Antioch's Recreation Department manages the operation of the City's parks and recreational facilities, while the Parks Division provides maintenance of parks in the City. Nearly all of the City's parks have barbeque pits, picnic tables, restrooms, turf landscaping, and youth play areas. Park amenities distributed throughout the City include softball, baseball, and soccer fields; horseshoe pits; volleyball, basketball, and tennis courts; tot lots; trails; and exercise courses. Antioch's current parks and recreation facilities are listed in Table 4.10-6.

According to the Antioch General Plan, the City plans to build parks within Sand Creek Focus Area of the General Plan, which is currently undeveloped. In addition, the City is considering development of a sports park within the Sand Creek Focus Area of the General Plan.[20]

Table 4.10-6
City of Antioch Parks

Name	Location	Acres
Barbara Price Marina Park	Foot of "L" Street	6.0
Prosserville Park	6th Street & O Street	1.6
Fairview Park	Crestview Drive & Aster Drive	3.0
City Park	10th Street & A Street	5.0
Gaylord Sports Fields	Wilbur Avenue & Apollo Court	14
Jacobsen Park	Jacobsen Drive	1.3
Meadowbrook Park	Yellowstone Drive & Calaveras Drive	8.5
Almondridge Park	Almondridge Drive & Beechnut Street	5.4
Contra Loma Estates Park	Mahogany Drive & Manzanita Way	5.0
Marchetti Park	Kendree Street south of Delta Fair Boulevard	5.0
Village East Park	Gentrytown Drive & Melon Court	7.4
Gentrytown Park	Carmona Way & Monterey Drive	14
Canal Park	Gentrytown Drive & Curtis Drive	4.8
Mira Vista Park	San Francisco Way & Hacienda Way	6.8
Chichibu Park	Longview Road & Acorn Drive	6.3
Mira Vista Hills Park	Silverado Drive & Cordoba Way	9.2
Antioch Community Park	James Donlon Boulevard & Blyth Drive	20.0
Mountaire Park	Sunset Land & Elmo Road	5.1
Eaglesridge Park	Eaglesridge Avenue & Greystone Drive	5.4
Harbour Park	Ashburton Drive & Lindley Drive	7.9
Hillcrest Park	Larkspur Drive & Sunflower Drive	18.0
Country Manor	Asilomar Drive & Carpinteria Drive	20.0
Prewett Family Water Park & Community Center	Deer Valley Road & Lone Tree Way	99.0
Deerfield Park	Deerfield Drive & Buckskin Drive	0.5
Knoll Park	Country Hills & Valley Way	5.0
Williamson Ranch Park	Lone Tree Way and Hillcrest Avenue	5.0
Meadow Creek Park	Vista Grande Drive	5.0
Markley Creek Park	Between Somersville Road & Summit Way	2.0
Hansen Park	Nortonville Way & Hansen Drive	-
Diablo West Park	2000 Prewett Ranch Drive	-
Chaparral Park	Prewett Ranch Drive & Candlewood Way	-
Heidorn Park	Vista Grande Drive	-
Dallas Ranch Park	Prewett Ranch Drive	5.0

Source:

- *City of Antioch General Plan Update EIR. July 2003.*
- *City of Antioch. Parks Directory. Available at http://www.ci.antioch.ca.us/citygov/publicworks/parks/. Accessed on March 9, 2015.*

Standard 3.5.7.2 in the City of Antioch General Plan and Section 9-4.1004 of the Antioch Municipal Code set a standard of 5 acres of parks and open space per 1,000 residents. The City

of Antioch receives land for parks through land dedications or purchases funded through fee collection. All park requirements are based on the Quimby Act, the State law regulating park exactions. The Antioch Municipal Code requires either a dedication of land at the rate of 0.015 acres per single-family unit, or payment of $1,050 per/unit. In addition, a payment of the adopted Community Park Fee is required.

Special-Use Facilities.

The City of Antioch has several special-use facilities, including the Antioch Municipal Marina located at the foot of L Street in downtown Antioch. Facilities at the Marina consist of a fishing pier, municipal boat ramp, and marina clubhouse. The Marina is located adjacent to and shares some facilities with the Antioch/Oakley Regional Shoreline. The Riverfront Promenade, which is also located along the San Joaquin River is a trail facility between Barbara Price Marina Park and G Street. The Prewett Family Water Park is also considered a special-use facility, and is available for exclusive group use (called a park "buy-out"). The multi-purpose room and poolside patio may be also be rented out for events.

The Nick Rodriquez Community Center houses a 200-seat theater used for seminars, theatrical productions, music recitals, and other special services. The Community Center also includes a large multi-purpose room which seats 200 people banquet style or 280 standing. In addition, the City of Antioch includes the Lone Tree Municipal Golf Course, an 18-hole public course and the Antioch Memorial Field and the Antioch Museum.

Other special use facilities are the City's Senior Citizens Center, a skate park, and the Lynn House Gallery. Most of the various programs for seniors are held at the Senior Citizens Center. The skate park, located adjacent to the Prewett Water Park, is open from dawn to dusk for in-line skating and skateboards. The Lynn House Gallery is available to show local art and exhibits.

In addition, Antioch residents have access to several special use facilities located outside the city limits, including the private Roddy Ranch Golf Course and the 75-acre CCC Fairgrounds, which includes an arena, grandstand, and facilities for housing show animals. The fairgrounds are used not only for the annual CCC Fair, but is in use continually as the site of preschool classes, a roller rink, flea market, auto races, cultural and music events, and community league ballfields.

Regional Facilities and Trails

The East Bay Regional Park District (EBRPD) operates three facilities in the Antioch area. The largest facility, Black Diamond Regional Preserve, is a 5,386-acre open space area accessed by multiple use trails (i.e., pedestrian, bike, and equestrian trails). The Preserve offers naturalist programs, and visitors can tour the underground mining museum and an historic cemetery.

The 775-acre Contra Loma Regional Park, adjacent to the Lone Tree Golf Course on the southern edge of the City, surrounds the Contra Loma Reservoir, and offers multiple-use trails for hiking, biking, and horseback riding. The reservoir is available for fishing, boating, sailboarding, and swimming. The Park also provides picnic areas, horseshoe pits, and a food concession stand. The smallest EBRPD facility in the City is the Antioch/Oakley Regional

Shoreline, which consists of seven acres fronting the San Joaquin River, north of downtown Antioch. The Shoreline has a 550-foot long fishing pier, a small beach, picnic tables, barbecues, and a 4.5-acre meadow. The EBRPD also oversees the Delta DeAnza Regional Trail. The Trail originates from Bay Point in the West Pittsburg area and runs east to a connection with the Marsh Creek Trail at East Cypress Road in Oakley.

Library Services

The CCC Library system operates 30 library facilities, funded primarily by local taxes. The City of Antioch currently has two libraries within the CCC Library system, including the Antioch Public Library and the GenOn Gateway Center for Learning, known as the Prewett Library. The 11,000 square foot Antioch Library is located at 501 West 18th Street, approximately 4.5 miles northwest of the project site, houses a large collection of materials including books, DVDs, and audio books.[21] The Prewett Library, which opened in January 2011, is located within the Antioch Community Center on Lone Tree Way, approximately one mile northwest of the project site, and is an "express library" where customers can pick up their requested materials as well as browse through nearly 9,000 items including best sellers, teen books, magazines, audio books, CDs, DVDs, and materials for children. The Prewett Library houses two early literacy workstations for children and is adjacent to the Antioch Community Center's technology lab which houses twenty five computers.[22] Both Antioch libraries offer free wireless internet access.

Electricity and Natural Gas

The Pacific Gas and Electric Company (PG&E) provides electricity and natural gas service to customers in the City of Antioch. The project site is located within PG&E's Delta Distribution Planning Area (DPA), which covers the southern and eastern portions of Antioch. Electricity distribution facilities are located throughout the DPA, with no one set of facilities dedicated to serving the City. In March 2005, PG&E filed an application with the State of California Public Utilities Commission (CPUC) to build a new distribution substation in Antioch, located 0.1 miles to the southwest of the project site, just opposite Sand Creek. The Antioch substation project was completed October 31, 2008.[23] The Antioch substation improves the reliability and safety of electric services to southern Antioch.

4.10.3 REGULATORY CONTEXT

Many agencies regulate public services, recreation, and utilities. The following discussion contains a summary review of regulatory controls pertaining to public services, recreation, and utilities, including federal, State, and local laws and ordinances.

Federal Regulations

The following are the federal environmental laws and policies relevant to public services, recreation, and utilities.

Federal Clean Water Act (CWA)

The Federal CWA establishes the basic structure for regulating discharges of pollutants into surface waters of the U.S., and sets water quality standards for all contaminants in surface waters. Water quality standards are intended to protect public health, enhance the quality of water, and serve the purposes of the CWA. The Act defines water quality standards as federal or state provisions or laws that designate the beneficial uses of water and establish water quality criteria to protect those designated uses.

National Pollutant Discharge Elimination System (NPDES)

The NPDES permit system was established in the federal CWA to regulate municipal and industrial discharges to surface waters of the U.S. Each NPDES permit contains limits on allowable concentrations and mass emissions of pollutants contained in the discharge. Sections 401 and 402 of the CWA contain general requirements regarding NPDES permits. Section 307 of the CWA describes the factors that EPA must consider in setting effluent limits for priority pollutants.

Section 402 of the CWA mandates that certain types of construction activities comply with the requirements of the NPDES stormwater program. The Phase II Rule, issued in 1999, requires that construction activities that disturb land equal to or greater than one acre require permitting under the NPDES program. In California, permitting occurs under the General Permit for Stormwater Discharges Associated with Construction Activity, issued to the State Water Resources Control Board (SWRCB), implemented and enforced by the nine Regional Water Quality Control Boards (RWQCBs). As of July 1, 2010, all dischargers with projects that include clearing, grading or stockpiling activities expected to disturb one or more acres of soil are required to obtain compliance under the NPDES Construction General Permit Order 2009-0009-DWQ.

Safe Drinking Water Act (SDWA)

The federal SDWA, which was enacted in 1974, gives the United States Environmental Protection Agency (EPA) the authority to set standards for contaminants in drinking water supplies. The EPA was required to establish primary regulations for the control of contaminants that affected public health and secondary regulations for compounds that affect the taste, odor, and aesthetics of drinking water. Accordingly, the EPA set a maximum contaminant level or treatment technique for each of the 83 contaminants in drinking water listed in the SDWA. Under the provisions of SDWA, the California Department of Health Services (DHS) has the primary enforcement responsibility. Title 22 of the California Administrative Code establishes DHS authority, and stipulates State drinking water quality and monitoring standards.

State Regulations

The following are the State environmental laws and policies relevant to public services, recreation, and utilities.

Senate Bill 610

The California Water Code requires coordination between land use lead agencies and public water purveyors. The purpose of this coordination is to ensure that prudent water supply planning has been conducted and that planned water supplies are adequate to meet both existing demands and the demands of planned development.

Water Code Sections 10910 – 10915 (inclusive), sometimes referred to as SB 610, require land use lead agencies: 1) to identify the responsible public water purveyor for a proposed development project, and 2) to request from the responsible purveyor, a "Water Supply Assessment" (WSA). The purposes of the WSA are (a) to describe the sufficiency of the purveyors' water supplies to satisfy the water demands of the proposed development project, while still meeting the current and projected water demands of customers, and, (b) in the absence of a currently sufficient supply to describe the purveyor's plans for acquiring additional water. Water Code Sections 10910-10915 delineate the specific information that must be included in the WSA.

According to CEQA Guidelines Section 15155, a "water-demand project" means:

(A) A residential development of more than 500 dwelling units.
(B) A shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.
(C) A commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.
(D) A hotel or motel, or both, having more than 500 rooms.
(E) An industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.
(F) A mixed-use project that includes one or more of the projects specified in subdivisions (a)(1)(A), (a)(1)(B), (a)(1)(C), (a)(1)(D), (a)(1)(E), and (a)(1)(G) of this section.
(G) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.
(H) For public water systems with fewer than 5,000 service connections, a project that meets the following criteria:
    1. A proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number of a public water system's existing service connections; or
    2. A mixed-use project that would demand an amount of water equivalent to, or greater than, the amount of water required by residential development that would represent an increase of 10 percent or more in the number of the public water system's existing service connections.

The Vineyards at Sand Creek Project meets criterion (A).

Senate Bill 221

SB 221 principally applies to the Subdivision Map Act, conditioning a tentative map on the applicant verifying that the public water supplier has sufficient water supply available to serve the project. SB 221 applies to any subdivision, which is defined as:

- A proposed residential development of more than 500 dwelling units, if the public water supplier has more than 5,000 service connections; or
- Any proposed development that increases connections by 10 percent or more, if the public water supplier has fewer than 5,000 connections.

SB 221 does not apply to any residential project proposed for a site that is within an urbanized area and has been previously developed for urban uses or housing projects that are exclusively for very low and low-income households. Per SB 221, the public water supplier is required to provide written verification of sufficient water supplies for a project. Sufficiency per SB 221 requires consideration of the following:

- Availability of water over the past 20 years;
- Applicability of any urban water shortage contingency analysis prepared per Section 10632 of the Water Code;
- Reduction in water supply allocated to a specific use by an adopted ordinance; and
- Amount of water that can be reasonably relied upon from other water supply projects, such as conjunctive use, reclaimed water, water conservation and water transfer.

The written verification must also provide evidentiary proof of the water supply, and the standard for that proof is largely similar to SB 610, as described above. In most cases, the water supply assessment prepared under SB 610 would meet the SB 221 requirement.

Senate Bill X7-7

The Water Conservation Act of 2009, commonly known as SB X7-7, requires all water suppliers to increase water use efficiency. The legislation divides water conservation into two sectors, urban water conservation and agricultural water conservation. SB X7-7 also requires that the DWR, in consultation with other State agencies, develop a single standardized water use reporting form, which would be used by both urban and agricultural water agencies. For the urban water conservation sector, SB X7-7 sets an overall goal of reducing per capita urban water use by 20 percent by December 31, 2020. The State intends to make incremental progress towards the overall goal by reducing per capita water use by at least 10 percent by December 31, 2015. Other requirements of SB X7-7 include, but are not limited to, the following:

- An urban retail water supplier shall include in its water management plan the baseline daily per capita water use, water use target, interim water use target, and compliance daily per capita water use. The DWR, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for consistent implementation of this requirement;

- The DWR shall adopt regulations for implementation of the provisions relating to process water;
- A Commercial, Institutional, Industrial (CII) task force is to be established that would develop and implement urban best management practices for statewide water savings; and
- Effective 2016, urban retail water suppliers who do not meet the water conservation requirements established by SB X7-7 are not eligible for State water grants or loans.

State Water Resources Control Board Emergency Drought Regulations

Due to the severe drought conditions that have persisted in California, On April 1, 2015, Governor Brown issued Executive Order B-29-15, which directed the SWRCB to adopt regulations to impose restrictions on the state's water suppliers to achieve a statewide 25 percent reduction in potable water use through February 28, 2016, as compared to the amount of potable water used in 2013.

In response to the Executive Order, on May 5, 2015, the SWRCB adopted drought emergency water conservation regulations (Cal. Code Regs., Title 23, §§ 863-865). In general, the regulations require water suppliers to reduce potable water use during the period from June 2015 to February 2016, as compared to 2013 water use levels. The magnitude of the reduction for each water supplier depends on the supplier's average water use from June to September 2014 in terms of the residential gallons per capita per day (R-GPCD) (§ 865[c][3]-[10]). The SWRCB's resolution adopting the regulations states that the regulations will remain in effect for 270 days, unless the Board determines that the regulations are no longer necessary due to changed conditions, or unless the Board renews the regulation due to continued drought conditions (SWRCB, Resolution No. 2015-0032 at 4 [May 5, 2015]).

Based on the City of Antioch's residential per capita water usage, the City must achieve a reduction of 28 percent pursuant to the SWRCB's regulation. Therefore, the City must reduce the total potable water use by 28 percent for each month during the period from June 2015 to February 2016, as compared to the potable water use in the same month in 2013.

Proposition 1A/Senate Bill 50

Proposition 1A/Senate Bill (SB) 50 (Chapter 407, Statutes of 1998) is a school construction measure authorizing the expenditure of State bonds totaling $9.2 billion through 2002, primarily for modernization and rehabilitation of older school facilities and construction of new school facilities. $2.5 billion is for higher education facilities and $6.7 billion is for K-12 facilities. Proposition 1A/SB 50 implemented significant fee reforms by amending the laws governing developer fees and school mitigation, including the following:

- Establishes the base (statutory) amount (indexed for inflation) of allowable developer fees at $1.93 per square foot for residential construction and $0.31 per square foot for commercial construction.
- Prohibits school districts, cities, and counties from imposing school impact mitigation fees or other requirements in excess of or in addition to those provided in the statute.

- Suspended for a period of at least eight years a series of court decisions allowing cities and counties to deny or condition development approvals on grounds of inadequate school facilities when acting on certain types of entitlements.

Proposition 1A/SB 50 prohibits local agencies from using the inadequacy of school facilities as a basis for denying or conditioning approvals of any "[…] legislative or adjudicative act […] involving […] the planning, use, or development of real property." (Government Code 65996[b]) Additionally, a local agency cannot require participation in a Mello-Roos for school facilities; however, the statutory fee is reduced by the amount of any voluntary participation in a Mello-Roos. Satisfaction of the Proposition 1A/SB 50 statutory requirements by a developer is deemed to be "full and complete mitigation." The law identifies certain circumstances under which the statutory fee can be exceeded, including preparation and adoption of a "needs analysis," eligibility for State funding, and satisfaction of two of four requirements (post-January 1, 2000) identified in the law including year-round enrollment, general obligation bond measure on the ballot over the last four years that received 50 percent plus one of the votes cast, 20 percent of the classes in portable classrooms, or specified outstanding debt. Assuming a district qualifies for exceeding the statutory fee, the law establishes ultimate fee caps of 50 percent of costs where the State makes a 50 percent match, or 100 percent of costs where the State match is unavailable. District certification of payment of the applicable fee is required before the city or county can issue the building permit.

Proposition 55

Proposition 55 is a school construction measure passed in 2004 authorizing the sale of approximately $12.3 billion in bonds to fund qualified K-12 education facilities to relieve overcrowding and to repair older schools. Funds target areas of the greatest need and must be spent according to strict accountability measures. These bonds would be used only for eligible projects. Approximately ten billion dollars would be allocated to K-12 schools, with the remaining 2.3 billion allocated to higher education facilities.

Department of Education Standards

The California Department of Education published the Guide to School Site Analysis and Development to establish a valid technique for determining acreage for new school development. Rather than assigning a strict student/acreage ratio, this guide provides flexible formulas that permit each district to tailor its ratios as necessary to accommodate its individual conditions. The Department of Education also recommends that a site utilization study be prepared for the site, based on these formulas.

Quimby Act

California Government Code Section 66477, Subdivision Map Act, referred to as the Quimby Act, permits local jurisdictions to require the dedication of land and/or the payment of in-lieu fees solely for park and recreation purposes. The required dedication and/or fee are based upon the residential density, parkland cost, and other factors. Land dedication and fees collected

pursuant to the Quimby Act may be used for acquisition, improvement, and expansion of park, playground, and recreational facilities or the development of public school grounds.

Local Regulations

The following are the local environmental laws and policies relevant to public services, recreation, and utilities.

City of Antioch General Plan

The City of Antioch General Plan objectives, standards, and policies relating to public services, recreation, and utilities that are applicable to the proposed project are presented below:

Growth Management Chapter

Objective 3.5.1.1 Ensure that community centers provide sufficient space to conduct civic meetings, recreational programs, and social activities to meet the needs of Antioch residents.

Standard 3.5.1.2 Maintain a minimum of 750 square feet of community center space per 1,000 population.

Objective 3.5.2.1 Maintain competent and efficient fire prevention and emergency fire, medical, and hazardous materials response services with first responder capability in order to minimize risks to life and property.

Standard 3.5.2.2 Prior to approval of discretionary development projects, require written verification from the Contra Costa County Fire Protection District that a five minute response time (including three minute running time) can be maintained for 80 percent of emergency fire, medical, and hazardous materials calls on a citywide response area basis.

Objective 3.5.3.1 Maintain an active police force, while developing programs and police facilities that are designed to enhance public safety and protect the citizens of Antioch by providing an average response time to emergency calls of between seven and eight minutes from the time the call is received to the time an officer arrives.

Standard 3.5.3.2 Maintain a force level within a range of 1.2 to 1.5 officers, including community service officers assigned to community policing and prisoner custody details, per 1,000 population. The ratio of community service officers assigned to community policing and prisoner

custody details to sworn officers shall not exceed 20 percent of the total number of sworn officers.

Objective 3.5.4.1 Maintain a water system that is capable of meeting the daily and peak demands of Antioch residents and businesses, including the provision of adequate fire flows and storage for drought and emergency conditions.

Standard 3.5.4.2 Adequate fire flow as established by the Contra Costa County Fire District, along with sufficient storage for emergency and drought situations and to maintain adequate service pressures.

Objective 3.5.5.1 A wastewater collection, treatment, and disposal system that is capable of meeting the daily and peak demands of Antioch residents and businesses.

Standard 3.5.5.2 Prior to approval of discretionary development projects, require written verification from the Delta Diablo Sanitation District that the proposed project will not cause the rated capacity of treatment facilities to be exceeded during normal or peak flows.

Objective 3.5.7.1 A system of park, recreational, and open space lands of sufficient size and in the appropriate locations, including provision of a range of recreational facilities, to serve the needs of Antioch residents of all ages.

Standard 3.5.7.2 Provide five acres of improved public and/or private neighborhood parks and public community parkland per 1,000 population, including appropriate recreational facilities.

Objective 3.5.8.1 Provision of schools in locations that are readily accessible to student populations, along with sufficient facilities to provide educational services without overcrowding.

Standard 3.5.8.2 Require new development to provide necessary funding and/or capital improvements to mitigate projected impacts on school facilities, as determined by the responsible school district.

Public Services and Facilities Chapter

Objective 8.3.1 Provide public and cultural facilities supportive of a high level of community activities, and facilitating conduct of the daily operations of municipal government.

Policy 8.3.2.d Work with the Contra Costa Library System to achieve and maintain facilities and titles consistent with the standards of the American Library Association.

Objective 8.4.1 Ensure a water system capable of providing high quality water to existing and future residences, businesses, institutions, recreational facilities, and other uses within the City of Antioch during peak use conditions, with sufficient water in storage reservoirs for emergency and fire protection needs.

Policy 8.4.2.a As part of the design of water systems, provide adequate pumping and storage capacity for both drought and emergency conditions, as well as the ability to provide fire flows required by the Contra Costa County Fire Protection District.

Policy 8.4.2.b Ensure that adequate infrastructure is in place and operational prior to occupancy or new development, such that (1) new development will not negatively impact the performance of water facilities serving existing developed areas, and (2) the performance standards set forth in the Growth Management Element will continue to be met.

Policy 8.4.2.h Provide the Contra Costa Water District with timely information on development proposals and projected levels of future growth so that it can maintain appropriate long-term master plans and refine the delivery of service and facilities to maintain the performance standards set forth in the Growth Management Element.

Objective 8.5.1 Ensure a wastewater collection, treatment, and disposal system capable of providing sewer services to existing and future residences, businesses, institutions, recreational facilities, and other uses within the City of Antioch during peak use conditions.

Policy 8.5.2.a As part of the design of sewer systems, provide adequate capacity for average and peak conditions.

Policy 8.5.2.b Ensure that adequate infrastructure is in place and operational prior to occupancy of new development, such that new development will (1) not negatively impact the performance of sewer facilities serving existing developed areas, and (2) the performance

standards set forth in the Growth Management Element will continue to be met.

Policy 8.5.2.e Work with Delta Diablo Sanitation District to explore and develop uses for treated wastewater. Where reclaimed wastewater can be economically delivered, require the installation of dual water systems permitting the use of reclaimed water supplies for irrigation purposes and industrial purposes.

Policy 8.5.2.i Provide the Delta Diablo Sanitation District with timely information on development proposals and projected levels of future growth so that it can maintain appropriate long-term master plans and refine the delivery of service and facilities to maintain the performance standards set forth in the Growth Management Element.

Objective 8.6.1 Reduce the amount of solid waste requiring disposal at landfills, enhancing the potential for recycling of the City's solid wastes.

Policy 8.6.2.j The City shall require all development projects to coordinate with appropriate departments and/or agencies to ensure that there is adequate waste disposal capacity to meet the waste disposal requirements of the project, and the City shall recommend that all development projects incorporate measures to promote waste reduction, reuse, recycling, and composting.

Objective 8.8.1 Cooperate with the Antioch Unified School District, Brentwood School District, and the Liberty Union High School District to facilitate the acquisition of sites and the construction of school facilities such that all school age children have access to uncrowded school facilities providing superior educational opportunities.

Policy 8.8.2.a Maintain clear, ongoing communications with area school districts on all matters related to the need for and provision of school sites and other administrative, educational, and recreational facilities.

Policy 8.8.2.b Coordinate the planning efforts of the City and local school districts by:

- Locating school facilities to facilitate the primary educational purpose of the facility and allow for safe pedestrian, bicycle, and vehicular access,

including the provision of traffic calming measures, where appropriate, in the vicinity of schools;

- Maximizing the joint use of facilities by the City and local school district (including, joint school/park sites and, where feasible, joint use of athletic fields, community meeting facilities, and provision of child and senior care facilities) by developing joint funding for such facilities through a combination of school district and City sources, provided that City contributions to joint facilities are consistent with the availability of such joint facilities to meet non-school recreational and other community needs;

- Designing attractive facilities that can also serve as neighborhood and community gathering places, and contribute to neighborhood identity and pride;

- Requiring reasonable reservation of appropriate locations for development of new schools as part of new development; and

- Regularly exchanging information on (1) the status of development review and construction, (2) the capacity of area schools, (3) the status of site acquisitions by the districts, and (4) applicable student generation factors by type of development.

Policy 8.8.2.c Require new development to pay all legally established fees or participate in land-based financing districts established by local school districts for the acquisition and development of school sites with adequate, permanent classroom space, as required by the local school district.

Policy 8.8.2.e Provide incentives in the City's residential growth management program for the provision of developer assistance to local school districts beyond nominally required mitigation fees. The objective of such incentive is that the combination of required feed and incentives provide a full contribution proportional to the needs of the proposed development for all school-related facilities to serve the proposed project.

Objective 8.9.1 Maintain a system of parks, specialized recreational facilities, and natural open spaces of sufficient size and variety and in the appropriate locations to serve the needs of Antioch residents of all ages.

Policy 8.9.2.a Provide a comprehensive system of recreation and park facilities and services needed by various segments of the City's population – including specific age groups, persons with special physical requirements, and groups interested in specific recreational activities – and make these facilities and services easily accessible and affordable to all users.

Policy 8.9.2.b Provide a range of public parklands for use by the community including the following.

- Neighborhood Park: A park or playground generally five to ten acres in size primarily developed to meet the recreational needs of citizens living within 0.5 to one mile.

- Joint School/Park: A neighborhood park development, improved, and maintained on or adjacent to school grounds by the City. Joint school/park facilities are utilized jointly by students and residents from the surrounding neighborhoods. Since school facilities are only available for use by the general public when school is not in session, only half of the total acreage is to be applied to the City's park standard.

- Community Park: A larger park or facility developed to meet the park and recreational needs of those living or working within a three to five mile radius. Community parks generally range in size from 10 to 60 acres.

- Regional Park: A park having a wide range of improvements not usually found in neighborhood or community parks, and designed to meet recreational needs of an entire regional population. Regional parks are generally over 100 acres and serve a population within a 30-minute driving time. Regional parks are generally provided by County and State agencies, and are therefore not included in local park standards.

- Specialized Recreation Areas: These include recreational areas of facilities devoted to specific activities or uses. Examples include linear parks (trails), sports and ball field complexes, swimming pools, river access and viewing areas, bicycle facilities, and riverfront trail and sitting areas, and marinas and boat launch facilities.

The facilities identified above, with the exception of regional parks devoted to preserving the natural environment, generally require relatively flat land. Areas over 10 percent slope will be reviewed by the City prior to dedication to determine the extent to which they serve the intended purposes of the park and to which dedication of such sloping lands will therefore be credited against the applicable performance standards of the Growth Management Element.

Policy 8.9.2.c Maintain a minimum size for neighborhood parks of five acres or more, unless there is a specific need for a smaller facility.

Policy 8.9.2.e Provide passive and active elements within neighborhood and community parks to meet the needs of citizens of all ages and interests, and thereby ensuring that the needs for lands for athletics and team sports is an equal to the provision of tranquil settings for picnicking, walking, and relaxation.

Policy 8.9.2.f Develop athletic field complexes and specialized recreation areas to accommodate the growing community needs for such facilities.

Policy 8.9.2.g Encourage the preservation of significant natural features and development of landscaped parkways and trail systems in new development in addition to required park development.

Policy 8.9.2.m Locate new park facilities so that they are highly visible from adjacent streets and neighborhoods to increase safety and enhance visual quality.

Policy 8.9.2.n Require the provision of private play space for children in small lot single family subdivisions and attached residential development.

Objective 8.10.1 Provision of an adequate number of fire stations, along with fire fighting personnel and equipment to protect Antioch residents and businesses.

Policy 8.10.1.a Work with the Contra Costa County Fire Protection District to provide high quality fire protection services to area residents and businesses. The City's role should include, but not be limited to:

- Determining the appropriateness of station location sites;
- Enforcement of building codes to reduce fire hazards;
- Collection of mitigation fees established by the fire district to construct needed additional stations within the Antioch Planning Area.
- Support the District in providing funding for personnel costs to staff stations within the City;
- Support the District in establishing fees that are adequate to mitigate the impacts of new development and income to support operation of new stations whose construction is financed with development fees; and
- Requiring reasonable reservation of appropriate sites for new fire stations as part of new development.

Policy 8.10.1.b In cooperation with the Contra Costa County Fire Protection District, conduct an annual assessment of the adequacy of facilities and services serving Antioch, personnel and staffing needs, and capital needs, based on anticipated growth and the level of service standard set forth in the Growth Management Element. This assessment should be undertaken as part of the annual review of proposed capital projects required by the California Government code (see Chapter 12, Implementation, Section 12.4b).

Policy 8.10.1.c Provide the Contra Costa County Fire Protection District with timely information on development proposals and projected levels of future growth so that it can maintain appropriate long-term master plans and

refine the delivery of service and facilities to maintain the performance standards set forth in the Growth Management Element.

Policy 8.10.1.d Involve the Fire Protection District in the development review process by referring development requests to the Fire District for review and comment.

Objective 8.11.1 Reduce the risk of crime and provide security to Antioch residents and businesses though maintenance of an adequate force of police personnel, physical planning strategies, and a high level of public awareness and support for crime prevention.

Policy 8.11.1.a Provide an adequate police force meeting the performance standards for police services set forth in the Growth Management Element.

As part of the annual budget and capital improvements program, assess crime prevention and law enforcement services, and evaluate the adequacy of Antioch's facilities and services, personnel and staffing needs, and capital needs, based on anticipated growth and the level of service standard set forth in the Growth Management Element.

Policy 8.11.1.b Provide sufficient facilities and staffing to ensure the safety of the citizens of Antioch by:

- Providing expedient response to emergency calls.
- Maintaining an efficient well-trained and adequately equipped force of police personnel.
- Providing neighborhood watch and crime prevention programs, and attempting to improve the participation of individual neighborhoods and businesses.
- Continuing to provide a variety of programs within the Police Department (e.g., traffic crime prevention, REACH, narcotics, investigations) to meet the needs of an active community.

Policy 8.11.1.c Provide basic requirements and incentives for the provision of design features in new development to reduce the potential for crime.

- Provide well-lighted and visible streets and street names, entrances, addresses, recreation areas, and parking areas.

- Limit access into and between buildings to reduce escape routes and undetected entry is made difficult.

- Provide landscaping which permits surveillance of open areas and entryways, and does not create places for concealment.

- Within multi-family and non-residential developments, design access systems to allow emergency vehicle access around buildings to the greatest extent possible.

- Within multi-family and non-residential developments, eliminate the potential for access to roofs by pallets, flag poles, etc.

Policy 8.11.1.d Involve the Antioch Police Department in the development review process by referring development requests to the Police Department for review and comment.

Objective 8.13.1 Ensure that the expansion of public facilities occurs in an equitable manner such that new development pays for all of the infrastructure and public facilities required to support the development without impacting levels of service provided to existing residents and businesses.

Policy 8.13.2.a Place the ultimate responsibility on the sponsor of proposed development projects for ensuring that the services and facilities needed to support the project and maintains applicable performance standards in the Growth Management Element are available at the time they are needed.

Policy 8.9.2.b Require that new development:

- Participate in a land-based financing district, construct, and/or pay for the new onsite capital improvements required to meet the applicable performance standards of the Growth Management Element;

- Be phased so as to ensure the services and capital facilities used by the new development meet the applicable performance standards of the Growth Management Element; and

- Ensure that, in the event public services or off-site capital facilities do not meet the applicable performance standards of the Growth Management Element prior to approval of the project, the level of service provided to existing development will not be further impacted by new development.

Policy 8.9.2.d Where permitted by law, require that special assessments for single-family residential development be paid off at the time of the initial sale of homes to individuals.

Policy 8.9.2.e Continue to apply existing policies and regulations precluding City financial assistance for any on-site capital improvements required by new development.

Policy 8.9.2.f As part of new development proposals, determine whether any service level deficiencies might result, and place needed conditions on the proposed development to ensure that:

- Service level standards will continue to be met, and

- New development will not result in any substantial, short- or long-term reduction in the level of municipal services provided by the City to existing developed areas.

Resource Management Chapter

Objective 10.3.1 Maintain, preserve and acquire open space and its associated natural resources by providing parks for active and passive recreation, trails, and by preserving natural, scenic, and other open space resources.

Policy 10.3.1.a Establish a comprehensive system of open space that is available to the public, including facilities for organized recreation; active informal play; recreational travel along formal, natural, and riverfront trails; passive recreation; and enjoyment of the natural environment.

Policy 10.3.1.b Implement the design standards of the Community Image and Design Element so as to maintain views of the San Joaquin River, Mount Diablo and its foothills, Black Diamond Mines Regional Preserve and other scenic features, and protect the natural character of Antioch's hillside areas as set forth in the Community Image and Design Element.[24]

Policy 10.3.1.c Maintain the shoreline of the San Joaquin River as an integrated system of natural (wetlands) and recreational (trails and viewpoints) open space as set forth in the Land Use Element and Public Services and Facilities Element.

Policy 10.3.1.d Where significant natural features are present (e.g., ridgelines, natural creeks and other significant habitat areas, rock outcrops, and other significant or unusual landscape features), require new development to incorporate natural open space areas into project design. Require dedication to a public agency or dedication of a conservation easement, preparation of maintenance plans, and provision of appropriate long-term management and maintenance of such open space areas.

Policy 10.3.1.e Require proposed development projects containing significant natural resources (e.g. sensitive or unusual habitats, special-status species, habitat linkages, steep slopes, cultural resources, wildland fire hazards, etc.) to prepare Resource Management Plans to provide for their protection or preservation consistent with the provisions of the Antioch General Plan, other local requirements, and the provisions of State and Federal law. The purpose of the Resource Management Plan is to look beyond the legal status of species at the time the plan is prepared, and provide a long-term plan for conservation and management of the natural communities found onsite. Resource Management Plans shall accomplish the following.

- Determine the significance of the resources that are found onsite and their relationship to resources in the surrounding area, including protected open space areas, habitat linkages and wildlife movement corridors;

- Define areas that are to be maintained in long-term open space based on the significance of onsite resources and their relationship to resources in the surrounding area; and

- Establish mechanisms to ensure the long term protection and management of lands retained in open space.

Policy 10.3.1.f Encourage public access to creek corridors through the establishment of trails adjacent to riparian resources, while maintaining adequate buffers between creeks and trails to protect sensitive habitats, special-status species and water quality to the maximum extent feasible.

Policy 10.3.1.g Where feasible, incorporate preserve and protect significant existing natural features as part of the design of new development projects rather than removing them. Where preservation of natural features is not feasible, introduce natural elements into project design. Impacts to significant natural features that cannot be preserved or reintroduced into the project design on-site shall be mitigated off-site.

Objective 10.5.1 Minimize the impacts of development located adjacent to natural areas, preserved in open space, and protected environmental resources.

Policy 10.5.1.a Minimize the number and extent of locations where residential, commercial, industrial, and public facilities land use designations abut lands designated for open space and protected resource areas (e.g., lands with conservation easements or set aside as mitigation for development impacts). Where such land use relationships cannot be avoided, use buffers and compatible uses to buffer and protect open space and protected resources from the adverse effects of residential, commercial, industrial and public facilities development.

Policy 10.5.1.b Ensure that the design of development proposed along a boundary with open space or protected resources provides sufficient protection and buffering for the open space and protected resources. The provision of buffers and transitions to achieve compatibility shall occur as part of the proposed development.

Policy 10.5.1.c In designing buffer areas, the following criteria shall be considered and provided for (when applicable) within the buffer areas to avoid or mitigate significant impacts.

- Aesthetics: How will development affect views from adjacent open space areas? What are the sensitive land uses and resources within open space areas and how might they be affected by changes in the visual environment?

- Light and Glare: Will a proposed development result in increased light or glare in open space areas that would impact open space uses or wildlife habitats within that open space?

- Noise: Will noise generated by the proposed development affect the public's quiet enjoyment of public open space? What are the sensitive noise receptors in open space areas and how can impacts on those sensitive receptors be avoided or mitigated? Can noise-generating uses be located away from noise sensitive areas?

- Fire Safety: How will development affect the risk of fire on adjacent open space and resource areas? How would development affect or be affected by existing fire abatement practices on adjacent open space and resource areas, including livestock grazing, prescribed fire, plant pest management, mowing, disking, ecological restoration and other practices?

- Public Safety: How will development adjacent to open space or resource areas increase the risk of vandalism, trespass, and theft in adjacent open space and resource areas?

- Habitat Management: How will proposed development affect habitat values on adjacent open space and resource areas? How will development prevent the spread of introduced animals and plant pests into adjacent open space and resource areas? How will proposed development affect wildlife migration corridors between or within open space and/or resource areas?

- Public Access Management: How will development adjacent to public open space and resource areas affect the maintenance of existing public facilities, such as roads, trails, fences, gates and restrooms? How might development adjacent to open space or resource areas facilitate illegal public access?

- Buffer Management: How can appropriate management of lands that are set aside as buffers between development and open space or resource areas be ensured?

Antioch Municipal Code

The City of Antioch Municipal Code sections relating to public services, recreation, and utilities that are applicable to the proposed project are presented below:

Section 9-4.1004 Standards and Formula for the Dedication of Land.

The proportion of a subdivision to be dedicated or the amount of fees to be paid in lieu thereof, or a combination of both, shall be determined according to the formula set forth in this section. The table for determining dedication shall be based on the following formula: the average number of persons per dwelling unit multiplied by the standard of 5.0 acres per 1,000 persons equals the required number of acres per dwelling unit. The following table (Table 4.10-7), based upon such formula, shall be followed:

Table 4.10-7
City of Antioch Standards and Formula for the Dedication of Park and Recreational Lands

Unit Category	Average Person Per Dwelling Unit	Average Requirement Per Dwelling Units
Single-Family, Detached	3.0	0.015
Single-Family, Attached	2.2	0.011
Duplexes	1.9	0.0095
Multi-Family	1.9	0.0095

Source: Antioch Municipal Code, 2015

Section 9-4.1005 Fee Determination.

A. *Formula determination.* The Council finds that the fees established by § 9-4.1007 of this article represents the value of the land prescribed for dedication in § 9-4.1004 of this article.

B. *Fees in lieu of land; 50 parcels or less.* If the proposed subdivision contains 50 parcels or less, the subdivider shall pay the fee established by § 9-4.1007 of this article, rather than having to dedicate land; except that when a condominium project, stock cooperative, or

community apartment project, as those terms are defined in Cal. Civil Code §§ 4105, 4125 and 4190, exceeds 50 dwelling units, dedication of land may be required, at the option of the city.

C. *Use of money*. The moneys collected pursuant to the provisions of this article shall be used only for the purpose of developing new or rehabilitating existing park or recreation facilities to serve a subdivision.

Section 9-4.1006 Criteria for Requiring Both the Dedication of Land and The Payment of Fees.

A. When only a portion of the land to be subdivided is proposed in the Park and Recreation Element of the General Plan as the site for a park, such portion shall be dedicated for park purposes. The value of such dedication shall be a credit against the fees required for any additional land which would have been required to be dedicated pursuant to § 9-4.1004 of this article.

B. When a major part of the park or recreational site has already been acquired by the city, and only a small portion of land is needed from the subdivision to complete the site, such remaining portion shall be dedicated, and the value of such dedication shall be a credit against the fees which otherwise would have been required to be paid. Fees collected shall be used for the improvement of the existing park and recreational facility or for the improvement of other parks and recreational facilities serving the subdivision.

Section 9-4.1007 Amount of Fees in Lieu of Land Dedications.

The Council finds that the average land value for improved residential land is $100,000 per acre. Therefore, the amount of fees required to be paid in lieu of land dedication shall be the following amounts (Table 4.10-8):

Table 4.10-8
City of Antioch In-Lieu Fees

Type of Unit	Fee Per Dwelling Unit
Single-Family Detached	$1,500
Single-Family, Attached	$1,100
Duplexes	$950
Multi-Family	$950
Mobile Home	$950

Source: Antioch Municipal Code, 2015

Section 9-4.1008 Determination of the Dedication of Land or the Payment of Fees.

Whether the City accepts the dedication of land or elects to require the payment of a fee in lieu thereof, or a combination of both, shall be determined by the consideration of the following:

A. The Environmental Resource and Land Use Elements of the General Plan;

B. Any adopted Specific Plan for the area;

C. The topography, geology, access, and location of land in the subdivision available for dedication;

D. The size and shape of the subdivision and the land available for dedication;

E. The feasibility of dedication;

F. The compatibility of dedication with the General Plan and Specific Plan, if any; and

G. The availability of previously acquired park property. The determination of the City as to whether land shall be dedicated or whether a fee shall be charged, or a combination thereof, shall be final and conclusive.

Section 9-4.1009 Credit for Improvements.

If the subdivider provides park and recreational improvements to the dedicated land, the value of the improvements, together with any equipment located thereon, shall be a credit against the payment of fees or dedication of land required by this article.

Section 9-4.1010 Credit for Private Recreation Improvements.

A. Planned developments and real estate developments, as defined in Cal. Bus. and Prof. Code § 11003, respectively, shall be eligible to receive a credit, as determined in this section, against the amount of land required to be dedicated, or the amount of the fee imposed, for the value of private open space within the development which is usable for active recreational uses.

B. Park and recreational uses shall include land and facilities for the activity of recreational community gardening, which activity consists of the cultivation by persons other than, or in addition to, the owner of such land, of plant materials not for sale.

C. Credit shall be computed on an acre-for-acre basis. A minimum of two acres of contiguous private open space or private recreational facilities shall be provided before any credit shall be given. A maximum credit of six and three-fourths acres shall be allowable for such private open space or private recreational facilities.

D. To be eligible for credit for private recreation improvements, the following standards shall be met:

    1. That yards, court areas, setbacks, and other open areas required to be maintained by the zoning and building laws and regulations shall not be included in the computation of such private open space;

2. That the private ownership and maintenance of the open space is adequately provided for by recorded written agreement, conveyance, or restrictions;

3. That the use of the private open space is restricted for park and recreational purposes by recorded covenant which runs with the land in favor of the future owners of the property and which cannot be defeated or eliminated without the consent of the city or its successor;

4. That the proposed private open space is reasonably adaptable for use for park and recreational purposes, taking into consideration such factors as size, shape, topography, geology, access, and location;

5. That the facilities proposed for open space are in substantial accordance with the provisions of the Park and Recreation Element of the General Plan of the City; and

6. That the open space for which credit is given is a minimum of two acres and provides a minimum of four of the following Local Park Basic Elements or a combination of such and other recreational improvements which will meet the specific recreation park needs of the future residents of the area. The following table (Table 4.10-9) represents the minimum acreage required before credit will be given for a particular element and the maximum credit which will be allowed for each element, though the element may encompass a larger area:

Table 4.10-9
City of Antioch Private Recreation Improvements Credit

Criteria List	Acres	
	Minimum	Maximum
Children's Play Apparatus Areas	0.50	0.75
Family Picnic Areas	0.25	0.75
Landscape Park-like and Quiet Area	0.50	1.00
Game Court Areas	0.25	0.50
Turf Playfields	10..	3.00
Swimming Pools with Adjacent Deck and Lawn Areas	0.25	0.50
Recreation Center Buildings	0.15	0.25

Source: Antioch Municipal Code, 2015

E. In smaller developments where less than two acres of contiguous private open space or recreational facilities are provided, credit shall be granted on an acre-for-acre basis for the space or facilities so provided.

F. Before credit is given, the Parks and Recreation Commission shall make written findings that the standards set forth in this section are met and shall report the same to the Planning Commission which shall in turn recommend to the Council.

Section 9-4.1011 Procedure.

A. At the time of the review of the tentative subdivision map, the Parks and Recreation Commission shall determine, after a report and recommendation from the City Engineer/Director of Public Works pursuant to the provisions of § 9-4.1008 of this article, the land to be dedicated and/or the fees to be paid by the subdivider. The recommendation by the City Engineer/Director of Public Works and the action of the Parks and Recreation Commission shall be forwarded to the Planning Commission and shall include the following:

    1. The amount of land required; or

    2. That a fee be charged in lieu of land; or

    3. That land and a fee be required; and/or

    4. That a stated amount of credit be given for private recreation facilities or unique natural and special features and the like;

    5. The location of the park land to be dedicated or the use of the in-lieu fees; and

    6. The approximate time when the development of the park and recreation facility shall commence.

B. Such action shall be reviewed by the Planning Commission for recommendation to the Council, which shall then make the final determination. In making its determination, the Council shall be guided by the same standards set forth in this article where applicable.

C. At the time of the filing of the final subdivision map, the subdivider shall dedicate the land and/or pay the fees as previously determined by the City.

D. Open space covenants for private park or recreational facilities shall be submitted to the city prior to the approval of the final subdivision map and shall be recorded.

Section 9-4.1012 Schedule of Development and Commitment of Funds.

The City shall develop a schedule specifying how, when, and where it will use the land or fees, or both, to develop park or recreational facilities to serve the residents of the subdivision. Any fees collected under this article shall be committed within five years after the payment of such fees or the issuance of building permits on one-half of the lots created by the subdivision, whichever occurs later. If such fees are not committed, they shall be distributed and paid to the then record owners of the subdivision in the same proportion that the size of their lot bears to the total area of all lots within the subdivision.

Section 9-4.1013 Exemptions.

Subdivisions containing less than five parcels and not used for residential purposes shall be exempted from the requirements of this article; provided, however, a condition may be placed on the approval of such parcel map that if a building permit is requested for the construction of a residential structure or structures on one or more of the parcels within four years, the fee may be required to be paid by the owner of each parcel as a condition to the issuance of such permit. The provisions of this article shall not apply to condominium projects or stock cooperatives which consist of the subdivision of airspace in an existing apartment building which is more than five years old when no new dwelling units are added.

Section 9-4.1014 Fees to be Placed in the Park Fee Trust Fund.

Fees received by the City pursuant to this article shall be deposited in a separate Park Fee Trust Fund. Moneys in said fund, including interest earned and accrued on such moneys, shall be expended solely for the purposes described in division (C) of § 9-4.1005 of this article. The Council shall receive a report at least annually on the fee and interest income, expenditures, and status of the Park Fee Trust Fund.

City of Antioch Measure O

Measure O, a voter approved update to the existing business license tax ordinance which became effective December 9, 2014, requires residential landlords to pay a per unit, per year tax for single-family dwelling units of $250.00 and $150.00 for multi-family rental units. In addition, the minimum business license tax for those businesses subject to the annual gross receipts calculation is now $100.00, excluding non-Professional Home Occupation businesses for which the minimum tax shall remain at $25.00. The purpose of Measure O is to provide General Fund revenue to help eliminate the projected structural deficits and improve essential community services, which would eliminate further cuts in expenditures, necessitating staffing reductions in General Fund departments, including the Antioch PD.

City of Antioch Drought Management

On May 12, 2015, the Antioch City Council took two related actions in response to the drought conditions in the State and the emergency regulations adopted by the SWRCB. First, the Council adopted a resolution updating the City's drought management program to implement Stage III of the Water Shortage Contingency Plan in the 2011 UWMP. The resolution declared that the City would meet the water use reduction requirements under the SWRCB's regulations by imposing specific water use restrictions on both residential and non-residential customers. Second, the City adopted an ordinance establishing drought management regulations, which impose specific water use restrictions and allow the City Manager to issue further rules and regulations to implement the City's drought management policies and programs.

4.10.4 IMPACTS AND MITIGATION MEASURES

This section describes the standards of significance and methodology utilized to analyze and determine the proposed project's potential impacts related to public services, recreation, and utilities. A discussion of the project's impacts, as well as mitigation measures where necessary, is also presented.

Standards of Significance

Consistent with Appendix G of the CEQA Guidelines a public services, recreation, and utilities impact may be considered to be significant if any potential effects of the following conditions, or potential thereof, would result with the proposed project's implementation:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new water or wastewater delivery, collection or treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Result in insufficient water supply available to serve the project from existing entitlements and resources, or new or expanded entitlements needed;
- Require sewer service that may not be available by the area's wastewater treatment provider;
- Be served by a landfill exceeding the permitted capacity to accommodate the project's solid waste disposal needs in compliance with all applicable laws;
- Increase the demand for additional law enforcement or fire protection services beyond the ability of the existing departments to provide adequate service such that new or physically altered facilities would be required, the construction of which could cause significant effects;
- Increase the total number of students beyond the capacity of local school districts such that new or physically altered facilities would be required, the construction of which could cause significant effects;
- 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;
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment; or
- Increase the demand for additional governmental services, including library, electricity, and natural gas services such that new or physically altered facilities would be required, the construction of which could cause significant effects.

Method of Analysis

The Public Services, Recreation, and Utilities chapter identifies any impacts of the proposed project on the existing public services and utilities that could occur if the project as currently proposed is approved and implemented. The standards of significance listed above were used to

delineate the significance of any potential impacts associated with the public services, recreation, and utilities of the proposed project.

Water Supply Assessment

The WSA prepared for the proposed project by West Yost Associates, documents the projected water demands associated with the proposed Vineyards at Sand Creek Project, the existing and projected water demands within the City boundaries and General Plan Study Area, past water supplies received by the CCWD, and projected supplies available from-long term sources.

It should be noted that the WSA was based on 650 single-family dwelling units, irrigated and non-irrigated parks and open space, and possibly a clubhouse with swimming pool for the proposed project. The WSA applied a City average of 3.15 persons per household, based on the 2010 Census. At that density, the proposed project could provide housing for up to approximately 2,048 people (3.15 persons per household x 650 total dwelling units = 2,048 people), which represents a worst case scenario.

Water Code Sections 10910-10915 delineate the specific requirements of a WSA. The WSA for the Vineyards at Sand Creek development is structured according to those requirements. The purpose of this WSA is to provide an analysis of whether the CCWD has sufficient projected water supplies to meet the anticipated demands of the Vineyards at Sand Creek development and other future development. The WSA prepared for the proposed project evaluates whether the total projected water *supply* estimated to be available for the project would meet the projected water *demand* associated with the proposed project, in addition to existing and planned future water uses.

The project's WSA does not reserve water or function as a "will serve" letter or any other form of commitment to supply water. The provision of water service would continue to be undertaken in a manner consistent with applicable CCWD policies and procedures, consistent with existing law. If there are changes in the Vineyards at Sand Creek development, the WSA shall be reviewed in order to assess if a subsequent WSA is required.

In addition, the *City of Antioch Water System Master Plan Update, 2010 Urban Water Management Plan,* and the *Conveyance System Master Plan Update* were utilized to determine whether the project is consistent with the adopted goals and policies as well as to determine adequate water supply and wastewater capacity for the proposed project.

The impact analysis evaluates the ability of the FPD and the FFD to serve the proposed project through a qualitative review of project characteristics, such as location, land uses, and access routes. The analysis also addresses whether the proposed project would require construction of additional facilities, including space for new staff and communication equipment.

Project-Specific Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in comparison with the standards of significance identified above.

4.10-1 Result in insufficient water supply. Based on the analysis below, the impact is *less than significant.*

According to the WSA prepared specifically for the proposed project, the projected water demand for the proposed project is based on the City's water demand factors for single-family residences that were documented in the City's 2010 UWMP, and an estimate of the required irrigation demand based on the City's Water Efficient Landscape Ordinance. Single-family dwelling unit potable water demand was projected to be 375 gallons per day per dwelling unit (gpd/DU) from 2020 through 2035.

The proposed project's projected water demand is shown in Table 4.10-10.

Table 4.10-10
Projected Potable Water Demand

Component	Projected Annual Potable Water Demand, AFY
Vineyards at Sand Creek	320
Unaccounted-for Water	10
Total Water Demand[1]	**330**

Notes:
AFY = Acre-Feet per Year
1. Based on 3 percent of total water production.
Source: WSA

As indicated in Table 4.10-10, the total projected annual water demand for the proposed project is approximately 330 AFY, assuming an unaccounted for water value of 3 percent of total water produced. The General Plan land use designation for the project site within the Sand Creek Focus Area indicates a potential Business Park. As noted in the WSA, commercial lands are projected to have a gross water demand of 3.41 AFY/acre. If the 141.6-acre site were to be developed as a Business Park, the projected water demand would be approximately 481 AFY (3.41 AFY/acre x 141.6 acres), which is greater than the 330 AFY projected for the proposed project.

Although the proposed project is not specifically identified in the City's 2010 UWMP, the Sand Creek Focus Area of the General Plan is included, and the City's growth projections (an additional 17,771 people from 2010 to 2035) and water demand projections (an additional 2,587 AFY from 2010 to 2035) would accommodate proposed project's potential population increase and projected water demand of 330 AFY. In addition, the proposed project's projected water demand of 330 AFY is less than the projected water demand for the project site, compared to what currently could be built under the General Plan.

The City's 2010 UWMP showed a water supply surplus in Normal and Single Dry Years through the year 2030, but shows a supply deficit during Multiple-Dry Years (see Table 4.10-11).

Table 4.10-11
City of Antioch Water Supply and Demand Comparison[1]

		2015	2020	2025	2030	2035
Supply and Demand Comparison – Normal Year						
Supply Totals, AFY		31,095	30,231	31,830	32,478	33,127
Demand Totals, AFY		22,678	21,301	22,400	23,048	23,697
Difference, AFY		8,417	8,930	9,430	9,430	9,430
Difference as % of Supply		27%	30%	30%	29%	29%
Difference as % of Demand		37%	42%	42%	41%	40%
Supply and Demand Comparison – Single Dry Year						
Supply Totals, AFY		31,095	30,231	31,606	31,557	31,942
Demand Totals, AFY		22,678	21,301	22,400	23,048	23,697
Difference, AFY		8,417	8,930	9,206	8,508	8,245
Difference as % of Supply		27%	30%	29%	27%	26%
Difference as % of Demand		37%	42%	41%	37%	35%
Supply and Demand Comparison – Multiple-Dry Year Events						
Multiple-Dry Year First Year Supply	Supply Totals, AFY	31,095	30,231	31,830	32,478	33,127
	Demand Totals, AFY	22,678	21,301	22,400	23,048	23,697
	Difference, AFY	8,417	8,930	9,430	9,430	9,430
	Difference as % of Supply	27%	30%	30%	29%	29%
	Difference as % of Demand	37%	42%	42%	41%	40%
Multiple-Dry Year Second Year Supply	Supply Totals, AFY	23,165	22,301	23,676	23,627	24,012
	Demand Totals, AFY	22,678	21,301	22,400	23,048	23,697
	Difference, AFY	487	1,000	1,276	578	315
	Difference as % of Supply	2%	4%	5%	2%	1%
	Difference as % of Demand	2%	5%	6%	3%	1%
Multiple-Dry Year Third Year Supply	Supply Totals, AFY	21,351	20,597	21,212	21,091	21,642
	Demand Totals, AFY	22,678	21,301	22,400	23,048	23,697
	Difference, AFY	-1,327	-704	-1,188	-1,957	-2,055
	Difference as % of Supply	-6%	-3%	-6%	-9%	-9%
	Difference as % of Demand	-6%	-3%	-5%	-8%	-9%

Notes:
1. From Tables 5-2 (City of Antioch Historical and Projected Water Demand) and 6-5 (Summary of Projected Water Supply During Hydrologic Normal, Single-Dry, and Multiple-Dry Years for City of Antioch).

Source: West Yost, 2015.

The proposed project is capable of being served by the City from the City's existing and future portfolio of water supplies. As further described in the WSA, city-wide supply and demand projections show a surplus through 2035 in normal years, single dry years, the first year of a multi-year drought, and the second-year of a multi-wide drought. While a deficit is projected in the third-year of a multi-year drought,[1] the City has a Water Shortage Contingency Plan in place that includes progressive stages of action that the City will take to reduce demand so that demand does not outpace supply. The Plan is designed to ensure that actions will be taken to reduce demands during a potential deficit,

[1] See Table 7-1 of the WSA, which projects a 9 percent deficit under multi-year drought conditions in 2035.

so that demand does not outpace supply. The Water Shortage Contingency Plan includes four different stages of action, which are designed to achieve reductions in demand of up to 50 percent when necessary. The Water Shortage Contingency Plan would be implemented during future multiple-year drought scenarios to ensure that cumulative demands, including demand from the proposed project, are met.

The recent drought regulations adopted by the SWRCB do not change the analysis in the WSA. The regulations are short-term rules based on current drought conditions and are slated to remain in effect for only 270 days after adoption, which is before the time when the proposed project would be constructed and operating. In contrast, the WSA is a long-term analysis that evaluates multiple hydrologic conditions that may occur over the next 20 years. The WSA projects that supplies will be adequate over this 20-year horizon. Further, as predicted by the WSA, on May 15, 2015 the City of Antioch City Council implemented the drought contingency measures specified by the 2010 UWMP. The measures are designed to ensure that City supplies remain sufficient during multiple drought years.

Therefore, the City's existing and projected potable water supplies are sufficient to meet the City's existing and projected future potable water demands, including those future water demands associated with the proposed project, to the year 2035 under all hydrologic conditions. As a result, the proposed project would have a ***less-than-significant*** impact to water supply.

Mitigation Measure(s)
None required.

4.10-2 Wastewater services. Based on the analysis below, the impact is *less than significant.*

If not already completed by the adjacent developer (the sewer line was previously approved and permitted for the Aviano residential project), the proposed project would extend the existing 24-inch sanitary sewer pipe, located at Heidorn Ranch Road, northeast of the project site. The pipe would be extended south along the future alignment of Heidorn Ranch Road to the project entry and west through the central Promenade to the Hillcrest Avenue entry.

Delta Diablo uses a wastewater generation rate of 200 gallons per day per residential unit. At this rate, the proposed project would generate 130,000 gallons (0.13 mgd) of wastewater per day (200 x 650 = 130,000). As described above, the WWTP capacity has an average dry weather flow of 22.7 mgd and in 2012, the average dry weather flow influent to the WWTP was 12.7 mgd. As a result, the WWTP would not exceed capacity with the implementation of the proposed project.

Wastewater generated by the proposed project would originate from residential sources and new sewer lines would be constructed on-site to accommodate the project-generated flows, which would be typical of residential areas. In addition, changes to the WWTP would not be required to treat the flows from the proposed project; therefore, buildout of

the proposed project would have a ***less-than-significant*** impact on wastewater management services.

Mitigation Measure(s)
None required.

4.10-3 Solid waste services. Based on the analysis below, the impact is *less than significant.*

The 2011 per capita disposal rate per resident in the City of Antioch was 3.6 pounds per day (ppd) per resident.[25] Utilizing an average persons per household of 3.0 for the City of Antioch, the project would generate approximately 1,950 new residents (650 units x 3.0 persons per household). Accordingly, the total daily solid waste generation resulting from the project would be approximately 7,020 lbs/day (1,950 new residents x 3.6 ppd per resident), which would equate to approximately 3.51 tons per day and 1,277.5 tons per year.

As discussed above, the Keller Canyon Landfill has a maximum permitted capacity of 3,500 tons of waste per day with a total estimated permitted capacity of approximately 75 million cubic yards, with only approximately 11.5 million cubic yards used to date. Only 16 percent of the Keller Canyon Landfill is currently being used; therefore, the substantial amount of available capacity remaining at Keller Canyon Landfill would be sufficient to serve the project's solid waste disposal needs. As a result, a ***less-than-significant*** impact related to solid waste would occur as a result of the proposed project.

Mitigation Measure(s)
None required.

4.10-4 Adequate fire protection and emergency medical services. Based on the analysis below, the impact is *less than significant.*

The Vineyards at Sand Creek Project is located within the jurisdiction of the CCCFPD. Buildout of the proposed project would result in the development of approximately 650 single-family dwelling units, which would introduce an estimated 1,950 new residents to the City of Antioch (650 units x 3.0 persons per household). Based on an added population of approximately 1,950 residents, CCCFPD would experience an increase in demand for fire protection and emergency medical services. As development occurs within the Sand Creek Focus Area of the General Plan, the CCCFPD plans to construct a new fire station to serve the area (i.e., the Sand Creek Focus Area). Construction of a new fire station would be needed to maintain acceptable response times within this area of the City. Once this fire station is constructed, the CCCFPD would be able to maintain adequate response times to the project site; however the anticipated dates of construction and operation of this station are unknown at this time. Currently, the nearest fire station to the project site is Station 88, located at 4288 Folsom Drive, within the City of Antioch. This station is located approximately 2.1 miles north of the project site, off of Hillcrest Avenue.

Impact fees for the CCFPD are collected by the Building Department at the time of application for a building permit. The current Fire Facility Impact Fees are $591.00 per single-family dwelling unit, or approximately $384,150.00 for development of 650 residential units on the project site. The Fire Facility Impact Fees would provide the project's fair share towards the construction of the new fire station. Therefore, the Fire Facility Impact Fees are anticipated to be adequate to cover any costs associated with equipment and/or personnel needed to serve the proposed project upon buildout.

The construction and operation of a new fire station has the potential to result in significant environmental impacts. However, the lack of specific information about a project site or project size precludes any project-specific, meaningful CEQA analysis of such a new station at this time, although the City here assumes and acknowledges that one or more significant environmental effects could result. Accordingly, an appropriate level of project-specific CEQA analysis must be completed prior to any approval of a new fire station that would serve the proposed project.

The proposed project itself would not require new fire facilities, and with the payment of the required fees, the proposed project would have a ***less-than-significant*** impact related to CCCFPD's ability to adequately serve the project.

Mitigation Measure(s)
None required.

4.10-5 Adequate law enforcement protection services. Based on the analysis below, the impact is *less than significant.*

The project site is currently within the City of Antioch and is currently serviced by the Antioch PD. The Antioch PD would continue to provide law enforcement services to the site after implementation of the proposed project. Buildout of the proposed project would result in the development of approximately 650 single-family dwelling units, which would introduce an estimated 1,950 new residents to the City (650 units x 3.0 persons per household). Based on an added population of approximately 1,950 residents, the Antioch PD would experience an increase in demand for police services within Beat 5 and 6.

Standard 3.5.3.2 in the Antioch General Plan, requires the staffing ratio for the Antioch PD to be 1.20 to 1.50 officers per 1,000 residents. However, the current Antioch PD staffing ratio is approximately 1.0, which is unacceptable. The impact to the Antioch PD staffing ratio is discussed in Table 4.8-1 of the Land Use and Planning / Agricultural Resources chapter of this EIR. Although, the staffing for the Antioch PD is unacceptable, staffing is not identified as a physical environmental impact. The need to build additional law enforcement facilities, which could cause further environmental impacts is considered a physical environmental impact. The Antioch PD has a state-of-the-art, 67,000-square foot police facility, located at 300 "L" Street, near the Marina. The police facility features an indoor firing range, weight training and exercise room, spacious locker rooms and a computer aided dispatch system and a new law enforcement facility is

not needed to serve the needs of the proposed project's residents. As a result, a ***less-than-significant*** impact related to the law enforcement services would occur.

Mitigation Measure(s)
None required.

4.10-6 Adequate school capacity. Based on the analysis below and with the implementation of mitigation, the impact would be *less than significant.*

The proposed project includes the development of up to 650 single-family residential units. Using the Brentwood Union and Liberty Union School District's student generation rates (see Table 4.10-5), the proposed project's single-family dwelling units would generate an estimated 261 new elementary school students, 77 new middle school students, and 135 new high school students for a total of 473 new students (see Table 4.10-12).

Table 4.10-12
Student Generation Projections for the Vineyards at Sand Creek Project

Grade Levels	Student Generation Factor per Household	# of Units	New Students
Brentwood Union High School District			
K-6	0.402	650	261
7-8	0.118	650	77
Subtotal			338
Liberty Union High School District			
9-12	0.2074	650	135
		Total Students	**473**

Source:
- *School Facility Needs Analysis for Brentwood Union School District. July 23, 2013.*

Personal communication with Debra Fogarty, Chief Business Officer, Liberty Union High School District. November 12, 2013.

As described above, the new students generated by the proposed project could be accommodated at the elementary schools (K-6); however, the middle school (7-8) and high school (9-12) students generated by the project would add additional students to schools already exceeding capacity. However, the applicant is required to pay school impact fees. Proposition 1A/SB 50 prohibits local agencies from using the inadequacy of school facilities as a basis for denying or conditioning approvals of any "[…] legislative or adjudicative act…involving …the planning, use, or development of real property" (Government Code 65996(b)). Satisfaction of the Proposition 1A/SB 50 statutory requirements by a developer is deemed to be "full and complete mitigation."

Because the LUHSD is already over capacity; and the BUSD is over capacity for grades 7-8, adding students to the districts may result in further overcrowding and compromising programs. Therefore, the project would have a ***potentially significant*** impact regarding

the need for the construction of new school facilities which could cause significant environmental impacts.

Mitigation Measure(s)
Consistent with State law, implementation of the following mitigation measure would reduce the impacts to a *less-than-significant* level.

4.10-6 *Prior to building permit issuance for any residential development, the developer shall submit to the Community Development Department written proof from the BUSD and the LUHSD that appropriate school mitigation fees have been paid.*

4.10-7 Adequate parks and recreation facilities. Based on the analysis below, with the implementation of mitigation measures, the impact would be *less than significant.*

The proposed project includes a total of 31.6 acres of private parks, open space, and landscaped areas (see Figure 4.10-2). The proposed project would include the construction of a detention basin south of the residential area and extension of the Sand Creek Trail, with the remaining acreage as undeveloped open space adjacent to the Sand Creek buffer area. In addition, the proposed project would include a focus on drought-tolerant and adaptive plant species. Approximately 25 percent of the site would be set aside for open space and buffer uses, as described in detail below.

Central Park

An approximate 2.1-acre private park space would be located in the middle of the project site. Separate parking would also be provided if recreational facilities, such as a community building or pool were incorporated in the Central Park.

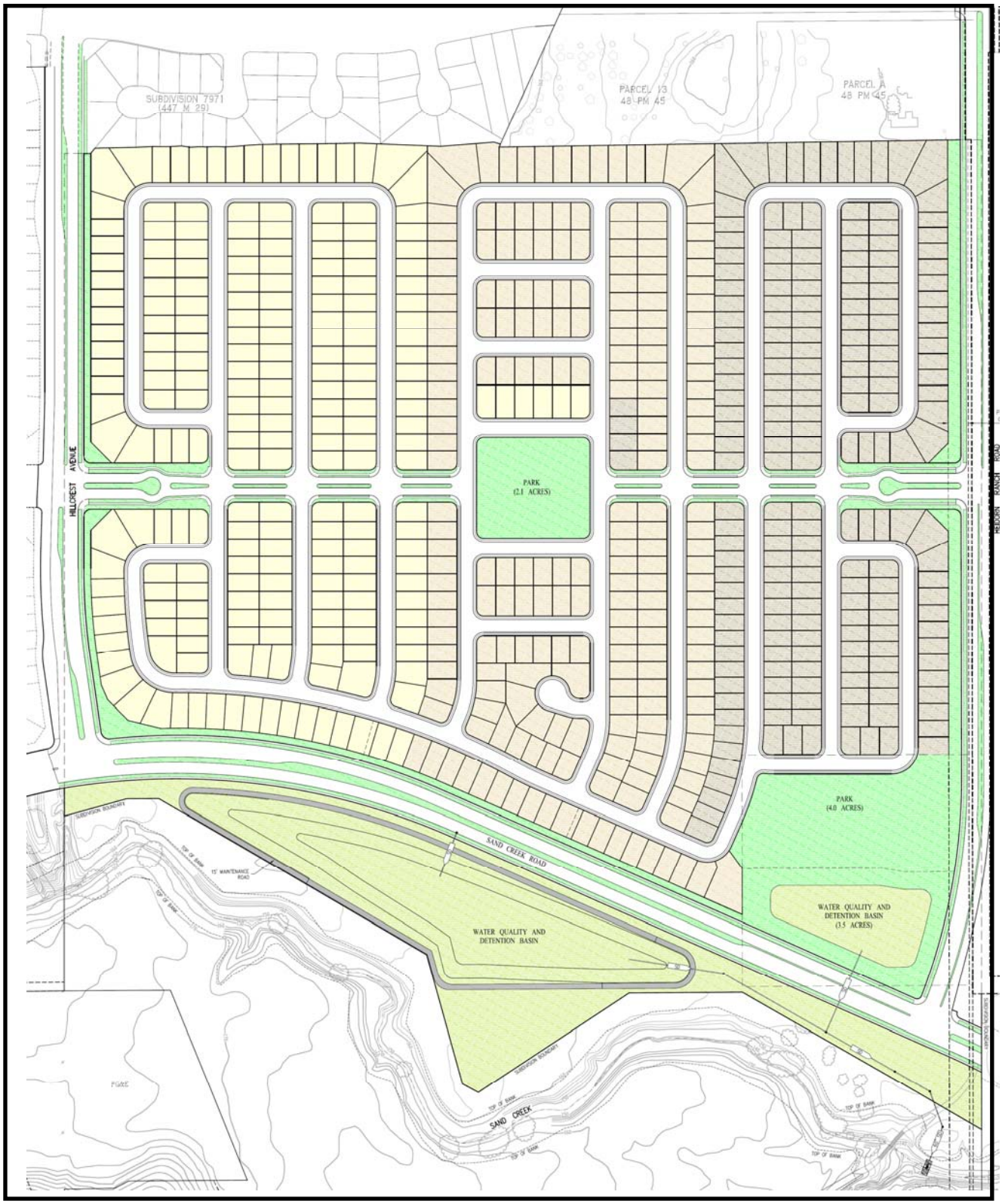
Southeastern Park

An approximate 7.5-acre private park space with a 3.5-acre detention basin would be located in the southeastern corner of the project site. A portion of the park space would include a large lawn area for youth playfields, as well as walking paths, a play structure, shade trees, and benches. Agricultural plantings would be used to delineate active areas from open space and provide a screening for the detention basin and Calpine Facility.

Sand Creek Regional Trail

A segment of the Sand Creek Regional Trail would be constructed within the project site. The trail would connect to the planned trail to the west, by the Aviano residential project, and would transition to the public sidewalk to the east along Sand Creek Road. Access points would be provided south of Sand Creek Road at Hillcrest Road and at Heidorn Ranch Road.

Figure 4.10-2
Proposed Park and Landscaped Areas



Southern Detention Basin Surrounding Open Space

Approximately 5.7 acres of open space would be included around and adjacent to the detention basin located south of Sand Creek Road.

Landscaping

Landscaping would be provided throughout the project site on a total of approximately 31.6 acres. Project landscaping would consist of street trees, shrubs, groundcover, agricultural plantings, and open lawn areas. Both entrances to the project site and the main spine street would be landscaped as would the project side of Hillcrest Road, Sand Creek Road and Heidorn Ranch Road including roadway medians. Public spaces, common spaces, and private landscaping areas would have an emphasis on drought-tolerant and adaptive plant species.

As described above, according to Section § 9-4.1004 of the Antioch Municipal Code, the amount of land to be dedicated for parks is based on the average number of persons per dwelling unit multiplied by the standard of 5.0 acres per 1,000 persons equals the required number of acres per dwelling unit.

At 650 single-family dwelling units, a minimum of 9.75 acres of parkland shall be included in the proposed project (0.015 average requirement per dwelling unit x 650 dwelling units = 9.75 acres). The proposed project includes a total of 31.6 acres of landscaped areas; however, according to Section § 9-4.1010(A) of the Antioch Municipal Code, maximum credit of 6.75 acres of private parkland would count towards the parkland dedication set forth in Standard 3.5.7.2 described above. Therefore, consistent with Section § 9-4.1007 of the Antioch Municipal Code, in addition to the private parkland included in the proposed project, the payment of a parkland dedication in-lieu fee would be required. As a result, the proposed project would result in a ***potentially-significant*** impact associated with parks and recreation facilities.

Mitigation Measure(s)
Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

4.10-7 *Per the Antioch Municipal Code, at the time of the filing of the final subdivision map, the subdivider shall provide a combination of parkland dedication and the payment of in-lieu fees into the City of Antioch's Park Fee Trust Fund to the satisfaction of the City Engineer/Director of Public Works.*

4.10-8 Adequate library services. Based on the analysis below, the impact is *less than significant.*

The proposed project would construct up to 650 single-family residential units, which would introduce an estimated 1,950 new residents to the City (650 units X 3.0 persons

per household).The population growth associated with the proposed project would increase the demand on library services for the City of Antioch. The CCC Library system is funded primarily by local taxes, and because the project would substantially increase the number of houses paying taxes, the project would generate additional revenue for the library system. The additional revenue is anticipated to provide funding for the CCC Library system to plan and purchase additional volumes, or to expand staff or facilities as part of long-term library planning. Therefore, the tax revenue generated from the proposed project would offset any increase in service demands related to the project. As a result, development of the proposed project would result in a ***less-than-significant*** impact related to library services.

Mitigation Measure(s)
None required.

4.10-9 Adequate electricity and natural gas services. Based on the analysis below, the impact is *less than significant.*

Development of the proposed project would increase demand for electricity and natural gas services in order to serve the additional 650 project residences. However, new construction associated with the proposed project would take place adjacent to developed areas currently serviced by electricity and natural gas providers.

Development of the project would occur in a location that is near to electricity and gas service. The proposed project would increase electricity and natural gas consumption, but not to a level that would be considered substantial in relation to regional or statewide energy supplies. As mentioned above, the PG&E substation located to the southwest of the project site provides reliability and safety of electric services within the project area. In addition, PG&E, the electricity and natural gas provider for the City of Antioch, regularly conducts load studies to determine whether additional facility upgrades are needed to meet growing energy demands.

The proposed 650 single-family dwelling units of the project would be subject to the standards of Title 24, California's Energy Efficiency Standards. Title 24 measures consist of developing an energy budget for structures and designing the structures to use less than or equal to the energy that is budgeted. Improved site planning and building design as well as energy conservation measures, as outlined in Title 24, would minimize the potential for wasteful, inefficient, or unnecessary consumption of energy. The project would be subject to the minimum energy conservation requirements of Title 24 of the California Code of Regulations, which are applicable to all building construction.

The proposed project would also include the construction of the necessary infrastructure in order to connect to existing electrical and gas lines in the project vicinity. With installation of the necessary infrastructure, PG&E would be able to serve the project, resulting in a ***less-than-significant*** impact.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in combination with other proposed and pending projects in the region. Other proposed and pending projects in the region under the cumulative context would include buildout of the City's General Plan, as well as development of the most recent planned land uses within the vicinity of the project area.

4.10-10 Development of the proposed project, in combination with future buildout in the City of Antioch, would increase demand for additional public services and utilities. Based on the analysis below, the cumulative impact is *less than significant.*

Water

According to the WSA prepared for the project, the project will not contribute to a significant cumulative impact related to water supply. As shown in the WSA, City-wide supplies are projected to be sufficient to meet future City-wide demands, including future demands from the project, during normal years, single dry years, the first year of a multi-year drought, and the second year of a multi-year drought. Although a deficit is projected for the third year of a multi-year drought,[2] the City has a Water Shortage Contingency Plan in place that is designed to reduce cumulative City-wide demands when needed, so that the cumulative demands will not outpace the City's supplies. Therefore, City water supplies are sufficient to meet the City's existing and projected future water demands, including those future demands associated with the proposed project, to the year 2035.

Wastewater

Delta Diablo has reported that solution recommendations for the projected future deficiency in the WWTP influent sewer would be developed as part of the WWTP Headworks Improvements Project predesign. The proposed land use changes would not significantly impact any potential projects that might be required to address this issue. The project's incremental increase in wastewater generation has been anticipated and would not represent a cumulatively considerable increase in the demand for wastewater treatment services.

Solid Waste

The Keller Canyon Landfill is currently at 16 percent capacity and is expected to have adequate capacity to serve the regional waste disposal needs. In addition, similar to water supply demands, as standards and regulations regarding solid waste reduction and

[2] See Table 7-1 of the WSA, which projects a 9 percent deficit under multi-year drought conditions in 2035.

recycling programs become more stringent, the overall demand for solid waste services would likely reduce compared to baseline conditions.

Law Enforcement, Fire Protection, Schools, Parks and Recreation Facilities

The proposed project would comply with all applicable City goals and policies, including payment of development impacts fees to support adequate provisions for fire facilities, staffing, and equipment, developer fees per SB 50 for schools (Mitigation Measure 4.10-6), dedication of parks and recreational lands, and with funding from Measure O. Similar to the proposed project, other future development projects would be required by the City to pay their fair-share fees toward the provision of adequate public services and facilities, including towards the necessary upgrades and expansions of facilities and equipment.

Therefore, the proposed project's increase in demand for public services and facilities would not be cumulatively considerable, and cumulative impacts would be considered ***less than significant***.

Mitigation Measure(s)
None required.

Endnotes

[1] West Yost Associates. *Water Supply Assessment for Sand Creek. January* 2015.
[2] City of Antioch. *City of Antioch General Plan*. Adopted November 24, 2003.
[3] City of Antioch. *City of Antioch General Plan EIR*. July 2003.
[4] City of Antioch. *Water System Master Plan Update*. August 2014.
[5] City of Antioch. *City of Antioch 2010 Urban Water Management Plan.* June 27, 2011.
[6] Delta Diablo Sanitation District. *Conveyance System Master Plan Update*. April 2010.
[7] West Yost Associates. *Water Supply Assessment for Sand Creek [pg. 3-2]. January* 2015
[8] West Yost Associates. *Water Supply Assessment for Sand Creek [pg. 6-3]. January* 2015
[9] West Yost Associates. *Water Supply Assessment for Sand Creek [pg. 6-4]. January* 2015
[10] City of Antioch. *City of Antioch 2010 Urban Water Management Plan [2-4]*. June 27, 2011.
[11] According to Patricia Chapman, Associate Engineer, Delta Diablo Sanitation District. *Proposed Tuscany Meadows Subdivision Letter Addressed to Nick Pappani.* October 3, 2013.
[12] CalRecycle, *Solid Waste Information System*. Available at: http://www.calrecycle.ca.gov/SWFacilities/. Accessed on March 9, 2015.
[13] *Ibid.*
[14] Personal communication with Fire Inspector Ted Leach, Contra Costa County Fire Protection District. December 5, 2012.
[15] City of Antioch. About Antioch Police Department. Available at: http://www.ci.antioch.ca.us/CityGov/Police/. Accessed on March 9, 2015.
[16] City of Antioch. *City of Antioch General Plan EIR [pg. 4.11-1]*. July 2003.
[17] United States Census Bureau. *Antioch (city), California Quickfacts.* Available at: http://quickfacts.census.gov. Accessed on March 10. 2015.
[18] Jack Schreder & Associates. *School Facility Needs Analysis for Brentwood Union School District*. July 23, 2013.
[19] Personal communication with Debra Fogarty, Chief Business Officer, Liberty Union High School District. November 12, 2013.

[20] City of Antioch. *City of Antioch General Plan EIR [pg. 4.11-9]*. July 2003.
[21] Contra Costa County Library. *About Antioch Library.* Available at: http://ccclib.org/locations/antioch.html. Accessed on March 9, 2015.
[22] Contra Costa County Library. *About GenOn Gateway for Learning (Prewett Library).* Available at: http://ccclib.org/locations/prewett.html. Accessed on March 9, 2015.
[23] State of California Public Utilities. *Pacific Gas & Electric Company's Delta DPA Capacity Increase Substation Project*. Available at: http://www.cpuc.ca.gov/environment/info/aspen/deltasub/deltasub.htm. Accessed on March 9, 2015.
[24] Policies related to viewshed protection are set forth in Section 5.4.2, General Design Policies. Hillside design policies are found in Section 5.4.14.
[25] CalRecycle. Jurisdiction Diversion/Disposal Rate Summary (2007 – Current). Available at: http://www.calrecycle.ca.gov/LGCentral/reports/diversionprogram/JurisdictionDiversionPost2006.aspx. Accessed on: March 10, 2015.

4.11 TRANSPORTATION AND CIRCULATION

4.11 TRANSPORTATION AND CIRCULATION

4.11.1 INTRODUCTION

The Transportation and Circulation chapter of the EIR addresses the existing and cumulative transportation and circulation conditions associated with the development of the Vineyards at Sand Creek Project (proposed project). The analysis includes consideration of automobile traffic impacts on roadway capacity, circulation, transit, and bicycle and pedestrian facilities.

The information contained within this chapter is based on the *Transportation Impact Assessment* for the Vineyards at Sand Creek Project prepared by Fehr & Peers.[1] All technical calculations are included as an appendix to the Transportation Impact Assessment (TIA), which can be found in Appendix O to this EIR.

4.11.2 EXISTING ENVIRONMENTAL SETTING

The section below describes the traffic study area and the physical and operational characteristics of the existing transportation system within the study area, including the surrounding roadway network, transit, bicycle and pedestrian facilities.

Roadway Network

Routes of Regional Significance (RRS) are major roadway and freeway corridors that serve regional traffic. RRS are identified in action plans adopted by the Contra Costa Transportation Authority (CCTA) under the countywide Measure J program.

The following RRS that could be affected by the project include:

- *State Route 4 (SR 4)* – SR 4 is an east-west freeway that extends from Hercules in the west to Stockton and beyond in the east. SR 4 has a northwest-southeast orientation between SR 160 and Walnut Boulevard in east Contra Costa County. SR 4 is currently under construction between Lone Tree Way and Sand Creek Road to widen the roadway from a two-lane highway to a four-lane freeway; the first phase of a grade-separated interchange at Sand Creek Road was recently completed. Between Sand Creek Road and Walnut Boulevard, SR 4 is a two-lane highway with at-grade intersections at Balfour Road and Marsh Creek Road. Each intersection is signalized and operated by the California Department of Transportation (Caltrans). SR 4 is a designated route of regional significance.

- *Lone Tree Way* – Lone Tree Way is an east-west roadway located north of the project site. The roadway provides two travel lanes in both directions to the west of Hillcrest Drive, and three travel lanes in both directions east of Hillcrest Drive. Class II bicycle

lanes are provided west of Hillcrest Drive. On-street bicycle facilities are not provided east of Hillcrest Drive. The posted speed limit is 45 miles per hour (mph) and on-street parking is not permitted. Lone Tree Way is a designated route of regional significance.

- *Hillcrest Avenue* – Hillcrest Avenue is a north-south oriented roadway that provides two travel lanes per direction in the study area. Hillcrest Avenue currently terminates at Prewett Ranch Drive in the south and Jacobsen Street in the north, past SR 4. The posted speed limit is 45 mph in the study area. Sidewalks and bicycle facilities are provided along the full length of Hillcrest Avenue within the study area. Hillcrest Avenue, north of Lone Tree Way, is a designated route of regional significance.

- *Sand Creek Road* – Sand Creek Road is a four-lane, east-west roadway that extends east from SR 4 through Brentwood. The posted speed limit is 45 mph and on-street parking is not permitted on Sand Creek Road. Class II bicycle lanes and sidewalks are provided along most of the roadway through Brentwood. The planned westerly extension of Sand Creek Road from SR 4 west to Dallas Ranch Road is a future route of regional significance.

In addition, the following roadway could be affected by the project:

- *Heidorn Ranch Road* – Heidorn Ranch Road is a north-south oriented roadway that provides one to two travel lanes per direction. Heidorn Ranch Road becomes Fairside Way to the north of Lone Tree Way. Sidewalks and bicycle facilities are provided on portions of Heidorn Ranch Road that have been built-out. The segment adjacent to the project site provides one lane in each direction without sidewalks, shoulders, or bicycle facilities. From just south of Lone Tree Plaza Drive to Lone Tree Way, the roadway provides two travel lanes in each direction, plus bicycle lanes, sidewalks, and a landscaped median that allows for the provision of left-turn pockets at intersections.

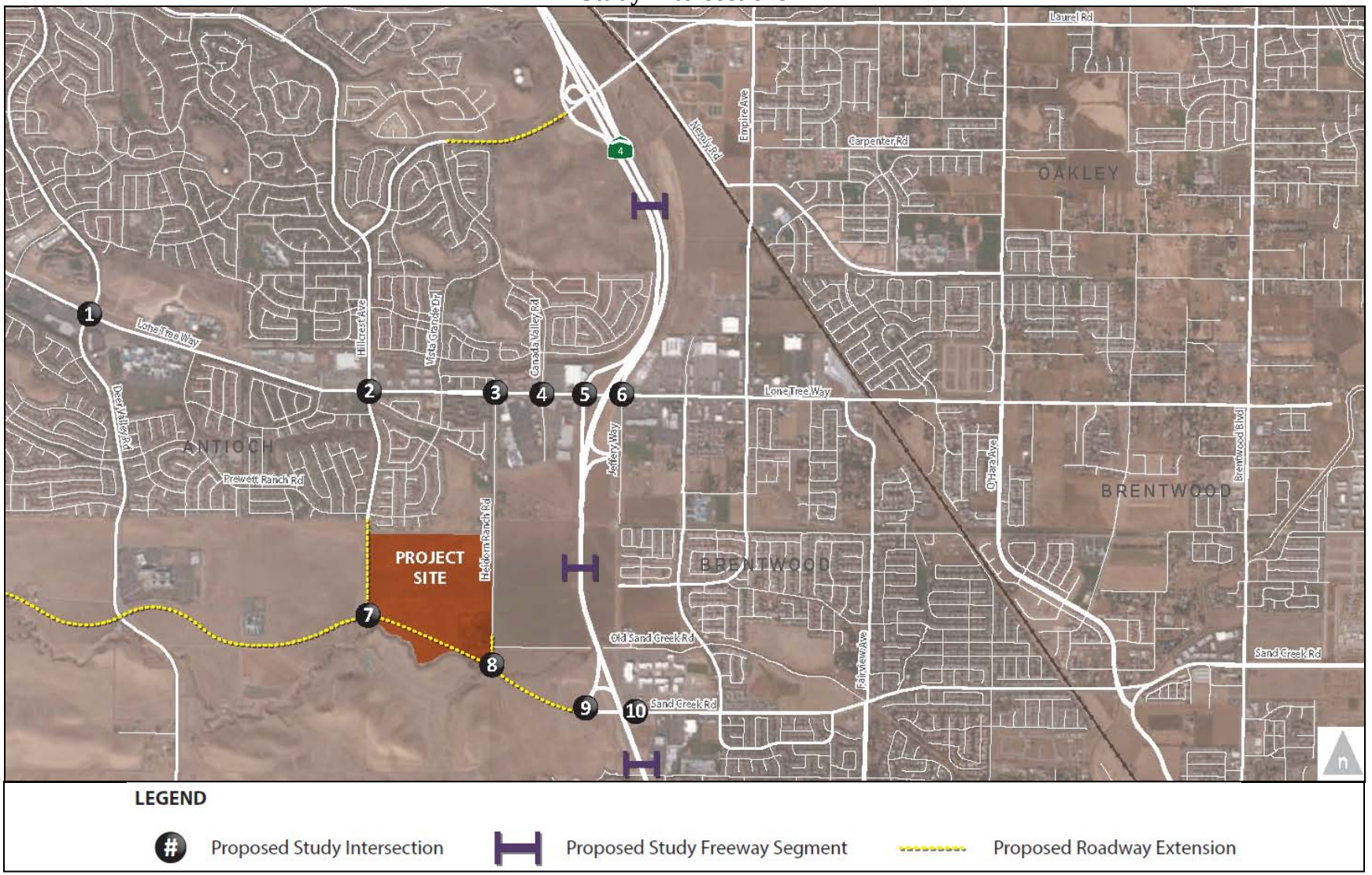
Study Intersections

Based on the project's trip generation and consultation with the City of Antioch, the following 10 study intersections were selected to be included in the area (see Figure 4.11-1):

1. Lone Tree Way at Deer Valley Road
2. Lone Tree Way at Hillcrest Avenue
3. Lone Tree Way at Heidorn Ranch Road
4. Lone Tree Way at Canada Valley Road
5. Lone Tree Way at SR 4 Eastbound (EB) Ramps
6. Lone Tree Way at SR 4 Westbound (WB) Ramps
7. Sand Creek Road at Hillcrest Avenue*
8. Sand Creek Road at Heidorn Ranch Road*
9. Sand Creek Road at SR 4 EB Ramps
10. Sand Creek Road at SR 4 WB Ramps

** future intersection*

Figure 4.11-1
Study Intersections



Source: Fehr & Peers, 2015.

The following freeway segments were also evaluated:

1. SR 4 north of Lone Tree Way;
2. SR 4 between Lone Tree Way and Sand Creek Road; and
3. SR 4 south of Sand Creek Road.

Common Traffic Analysis Terms

Level of Service (LOS) is a qualitative measure of traffic operating conditions, whereby a letter grade, from A to F is assigned, based on quantitative measurements of delay per vehicle. The grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. In general, LOS A represents free-flow conditions, and LOS F represents severe delay under stop-and-go conditions.

Table 4.11-1 and 4.11-2 summarize the relationship between delay and LOS for signalized and unsignalized intersections. The delay ranges for unsignalized intersections are lower than for signalized intersections as drivers expect less delay at unsignalized intersections.

Table 4.11-1
Signalized Intersection LOS Definitions

Level of Service	Description of Operations	Average Delay (sec/veh)
A	Insignificant Delays: No approach phase is fully used and no vehicle waits longer than one red indication.	≤ 10
B	Minimal Delays: An occasional approach phase is fully used. Drivers begin to feel restricted.	> 10 to 20
C	Acceptable Delays: Major approach phase may become fully used. Most drivers feel somewhat restricted.	> 20 to 35
D	Tolerable Delays: Drivers may wait through no more than one red indication. Queues may develop but dissipate rapidly without excessive delays.	> 35 to 55
E	Significant Delays: Volumes approaching capacity. Vehicles may wait through several signal cycles and long vehicle queues from upstream.	> 55 to 80
F	Excessive Delays: Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections.	> 80

Note: sec/veh = Seconds per vehicle

Source: Highway Capacity Manual (Transportation Research Board 2010).

Table 4.11-2 Unsignalized Intersection LOS Definitions		
Level of Service	**Description of Operations**	**Average Delay (sec/veh)**
A	No delay for stop-controlled approaches.	≤ 0 to 10
B	Operations with minor delays.	> 10 to 15
C	Operations with moderate delays.	> 15 to 25
D	Operations with some delays.	> 25 to 35
E	Operations with high delays and long queues.	> 35 to 50
F	Operation with extreme congestion, with very high delays and long queues unacceptable to most drivers.	> 50
Note: sec/veh = Seconds per vehicle *Source: Highway Capacity Manual (Transportation Research Board 2010).*		

For freeway segments, the East County Action Plan for Routes of Regional Significance has established the delay index as the Multimodal Transportation Service Objective (MTSO) for SR 4 through the study area. The delay index is the ratio of actual travel times on a facility divided by the travel times that occur during non-congested free-flow periods. Should the delay index exceed 2.5 during either the AM or PM peak period, freeway operations would be considered deficient. A delay index of 2.5 would equate to peak hour travel taking 2.5 times as long as off-peak travel or an average travel speed below 26 miles per hour assuming a non-congested free-flow speed of 65 miles per hour.

Existing Intersection Conditions

Weekday morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM) peak period intersection turning movement counts were collected at four of the study intersections, including separate counts of pedestrians and bicyclists, in August 2014, when area schools are in normal session. For the remaining study intersections, traffic counts taken in 2013 for the Aviano Residential Traffic Impact Study were used. The 2013 and 2014 traffic counts were compared; during the morning peak hour, 2014 observed traffic volumes were approximately 10 percent higher than in 2013 for intersections along Lone Tree Way and 2014 volumes were approximately two percent higher than 2013 volumes in the evening peak hour. For intersections along Lone Tree Way where new data was not collected, the 2013 data was increased by the observed growth rate to reflect 2014 conditions.

Existing intersection lane configurations, signal timings, and peak hour turning movement volumes were used to calculate the LOS for the study intersections during each peak hour. The results of the LOS analysis for Existing Conditions are presented in Table 4.11-3.

Table 4.11-3
Intersection LOS – Existing Conditions

Intersection	Control[1]	Peak Hour	Delay[2]	LOS
1. Lone Tree Way at Deer Valley Rd.	Signal	AM	48	D
		PM	40	D
2. Lone Tree Way at Hillcrest Ave.	Signal	AM	31	C
		PM	22	C
3. Lone Tree Way at Heidorn Ranch Rd.	Signal	AM	5	A
		PM	6	A
4. Lone Tree Way at Canada Valley Rd.	Signal	AM	30	C
		PM	39	D
5. Lone Tree Way at SR 4 EB Ramps	Signal	AM	24	C
		PM	22	C
6. Lone Tree Way at Jeffery Ave.	Signal	AM	18	B
		PM	24	C
9. Sand Creek Rd. at SR 4 EB Ramps	Signal	AM	20	B
		PM	18	B
10. Sand Creek Rd. at SR 4 WB Ramps	Signal	AM	13	B
		PM	12	B

Notes:
[1] Signal = signalized intersection
[2] Average intersection delay is calculated for all signalized intersections using the HCM method for vehicles.

Source: Fehr & Peers, 2015.

Existing Freeway Conditions

Mainline traffic counts were conducted on SR 4, south of Sand Creek Road, in spring 2014. Traffic volumes at the Sand Creek Road and Lone Tree Way interchanges were used to estimate traffic volumes on the mainline segments from north of Sand Creek Road to north of Lone Tree Way, as presented in Table 4.11-4. The traffic volumes and number of travel lanes were used to calculate vehicle speeds using the 2010 Highway Capacity Manual *(*HCM 2010) method, which were then used to calculate the delay index. The results were verified through travel of the corridor during peak hours.

SR 4 north of Sand Creek Road operates at free-flow speeds during both the morning and evening peak hour. SR 4 south of Sand Creek Road experiences congestion during peak hours with a delay index of 1.8 during the morning peak hour and 1.9 during the evening peak hour, indicating that peak travel takes approximately twice as long as off-peak travel. Although the segment of SR 4 south of Sand Creek Road experiences congestion, operations are within the service objective established by the CCTA in the East County Action Plan.

Table 4.11-4
Existing Freeway Conditions

Segment	Direction	Peak Hour	Volume	Delay Index
South of Sand Creek Road	NB/WB	AM	1,325	1.8
		PM	1,638	1.9
Between Sand Creek Road and Lone Tree Way	NB/WB	AM	1,773	1.0
		PM	2,034	1.0
North Lone Tree Way	NB/WB	AM	1,858	1.0
		PM	1,934	1.0
North Lone Tree Way	SB/EB	AM	2,026	1.0
		PM	2,448	1.0
Between Sand Creek Road and Lone Tree Way	SB/EB	AM	1,791	1.0
		PM	2,284	1.0
South of Sand Creek Road	SB/EB	AM	1,475	1.8
		PM	1,507	1.9

Note: NB/WB = Northbound/Westbound, SB/EB = Southbound/Eastbound

Source: Fehr & Peers, 2015.

Transit System

Two major public mass transit operators provide service within or adjacent to the study area, including Bay Area Rapid Transit (BART) and the Eastern Contra Costa Transit Authority (or Tri Delta Transit).

BART

BART is a rapid mass transit system which provides regional transportation connections to much of the Bay Area. BART runs from the North Bay Area in Richmond to the South Bay Area in Fremont. In the east-west direction BART runs from Pittsburg to the San Francisco Airport and Millbrae with several connections in Oakland. The Pittsburg/Bay Point BART station, which is closest to the proposed project, serves all of Pittsburg, Bay Point, Antioch, and all other surrounding cities and runs from 4:00 AM to 12:00 AM daily, with a weekday frequency of 15 minutes. A future E-BART extension to Hillcrest Avenue in Antioch is currently under construction. The E-BART service will connect with BART at the Bay Point BART station. It should be noted that an additional E-BART Station is also planned at Railroad Avenue and the widening of SR 4 is currently underway to accommodate the planned station.

Tri Delta Transit

Tri Delta Transit provides transit service in eastern Contra Costa County, serving the communities of Brentwood, Antioch, Oakley, Concord, Discovery Bay, Bay Point, and Pittsburg. Thirteen routes operate on weekdays with four routes operating on weekends. Four routes operate in the vicinity of the project site, with Routes 380, 383, 385 and 392 stopping at the Hillcrest Avenue/Lone Tree Way intersection.

Route 380 and 392 provide access to the Pittsburg/Bay Point BART station, with Route 380 providing weekday service on 30-minute headways and Route 392 providing weekend service on 60-minute headways. Route 385 provides weekday service on hour headways between the Brentwood Park-n-Ride lot (on Walnut Boulevard at Central Boulevard) and the Antioch Park-n-Ride lot at Hillcrest Avenue, where connections to numerous other bus routes are provided. The Route 383 loop also provides weekday connections to the Antioch Park-n-Ride lot with 60-minute headways. In addition to the regular transit service to the project area, dial-a-ride door-to-door service within Eastern Contra Costa County is provided by Tri Delta Transit for disabled people of all ages and senior citizens.

Bicycle and Pedestrian System

Bicycle paths, lanes and routes are typical examples of bicycle transportation facilities, which are defined by Caltrans as being in one of the following three classes:

Class I – Bike Paths

Class I bike paths are paved trails that are separated from roadways. The trails are shared with pedestrians.

Class II – Bike Lanes

Class II bike lanes are lanes on roadways designated for use by bicycles through striping, pavement legends, and signs.

Class III – Bike Routes

Class III bike routes are roadways designated for bicycle use by signs only, The routes may or may not include additional pavement width for cyclists.

Portions of Heidorn Ranch Road, Hillcrest Avenue, Canada Valley Road (north of Lone Tree Way), and Deer Valley Road provide Class II bicycle facilities with separate lanes designated for bicycle travel. The Mokelumne Trail runs parallel with Lone Tree Way north of the project site. The Mokelumne Trail continues west, connecting to the Pittsburg/Bay Point BART Station, and east through Brentwood. The trail currently does not have a connection across SR4. Other Class I facilities in the area include the Canada Valley Trail, Mesa Ridge Trail, and Deerfield Corridor Trail. The Sand Creek Trail would be constructed along Sand Creek as development occurs in the area.

4.11.3 REGULATORY CONTEXT

Existing transportation policies, laws, and regulations that would apply to the proposed project are summarized below.

State Regulations

Caltrans has jurisdiction over State highways. Therefore, Caltrans controls all construction, modification, and maintenance of State highways, such as SR 4. Any improvements to these roadways would require Caltrans' approval.

Guide for the Preparation of Traffic Impact Studies

Caltrans' *Guide for the Preparation of Traffic Impact Studies* (December 2002) provides guidance for Caltrans staff who review local development and land use change proposals. The Guide also informs local agencies about the information needed for Caltrans to analyze the traffic impacts to state highway facilities, which include freeway segments, on- or off-ramps, and signalized intersections.

Local Regulations

The following are the City of Antioch's policies relevant to transportation and circulation.

City of Antioch General Plan

Vehicular Circulation

Objective 7.3.1 Provide adequate roadway capacity to meet the roadway performance standards set forth in the Growth Management Element.

Policy 7.3.2.a Facilitate meeting the roadway performance standards set forth in the Growth Management Element and improving traffic flow on arterial roadways.

- Work with the UP and BNSF railroads to construct grade separations along the tracks at Somersville Road, Hillcrest Avenue, "A" Street, the proposed Viera Road extension, and the proposed Phillips Lane extension.
- Promote the design of roadways to optimize safe traffic flow within established roadway configurations by minimizing driveways and intersections, uncontrolled access to adjacent parcels, on-street parking, and frequent stops to the extent consistent with the character of adjacent land uses.

- Provide adequate capacity at intersections to accommodate future traffic volumes by installing intersection traffic improvements and traffic control devices, as needed, as development occurs.
- Facilitate the synchronization of traffic signals.
- Where needed, provide acceleration and deceleration lanes for commercial access drives.
- Provide for reciprocal access and parking agreements between adjacent land uses, thereby facilitating off-street vehicular movement between adjacent commercial and other nonresidential uses.
- Encourage regional goods movement to remain on area freeways and other appropriate routes.

Policy 7.3.2.b Design and reconfigure collector and local roadways to improve circulation within and connections to residential and commercial areas.

- Implement appropriate measures to mitigate speeding and other traffic impacts in residential areas.
- Implement roadway patterns that limit through traffic on local residential streets.

Policy 7.3.2.c Require the design of new developments to focus through traffic onto arterial streets.

Policy 7.3.2.d Where feasible, design arterial roadways, including routes of regional significance, to provide better service than the minimum standards set forth in Measure C and the Growth Management Element. Thus, where feasible, the City will strive to maintain a "High D" level of service (v/c [volume-to-capacity ratio] = 0.85 to 0.89) within regional commercial areas and at intersections within 1,000 feet of a freeway interchange. The City will also strive where feasible to maintain low-range "D" (v/c = 0.80 to 0.84) in all other areas of the City, including freeway interchanges.

Policy 7.3.2.e Establish Assessment Districts in areas that will require major roadway infrastructure improvements that will benefit only that area of the City, and thereby facilitate the up-front construction of needed roadways.

Policy 7.3.2.f Design street intersections to ensure the safe passage of through traffic and accommodate anticipated turning movements. Implement intersection improvements consistent with the following lane geometrics, unless traffic analyses indicate the need for additional turn lanes.

Policy 7.3.2.g Require traffic impact studies for all new developments that propose to increase the approved density or intensity of development or are projected to generate 50 peak hour trips or more at any intersection of Circulation Element roadways. The purpose of these studies is to demonstrate that:

- The existing roadway system, along with roads to be improved by the proposed project, can meet the performance standards set forth in Sections 3.4.1 and 3.4.2 of the Growth Management Element; and
- Required findings of consistency with the provisions of the Growth Management Element can be made.

Policy 7.3.2.k Where single family residences have no feasible alternative but to front on collector or arterial roadways, require, wherever possible, that circular driveways or on-site turnarounds be provided to eliminate the need for residents to back onto the street.

Policy 7.3.2.l Locate driveways on corner parcels as far away from the intersection as is possible.

Policy 7.3.2.m Avoid locating driveways within passenger waiting areas of bus stops or within bus bays. Locate driveways so that drivers will be able to see around bus stop improvements.

Policy 7.3.2.n Use raised medians as a method for achieving one or more of the following objectives: access control, separation of opposing traffic flows, left turn storage, aesthetic improvement, and/or pedestrian refuge.

Policy 7.3.2.o Where medians are constructed, provide openings at the maximum feasible intervals, typically no less than 1/8 mile.

Policy 7.3.2.v Private streets, where permitted, shall provide for adequate circulation and emergency vehicle access. Private streets that will accommodate more than 50 vehicles per hour in the peak hour or that are designed for on-street parking shall be designed to public street standards. The design of other private streets shall be subject to the review and approval of the City Engineer. Private streets shall be improved to public street standards prior to acceptance of dedications to the City.

Policy 7.3.2.x Require new development to construct all on-site roadways, including Circulation Element routes, and provide a fair share contribution for needed off-site improvements needed to maintain the roadway performance standards set forth in the Growth Management Element. Contributions for off-site improvements may be in the form of fees and/or physical improvements, as determined by the City Engineer. Costs associated with mitigating off-site traffic impacts should be allocated on the basis of trip generation, and should have provisions for lower rates for income-restricted lower income housing projects needed to meet the quantified objectives of the General Plan Housing Element.

Non-Motorized Transportation

Objective 7.4.1 Maintenance of a safe, convenient, and continuous network of pedestrian sidewalks, pathways, and bicycle facilities serving both experienced and casual bicyclists to facilitate bicycling and walking as alternatives to the automobile.

Policy 7.4.2.a Design new residential neighborhoods to provide safe pedestrian and bicycle access to schools, parks and neighborhood commercial facilities.

Policy 7.4.2.b Design intersections for the safe passage of pedestrians and bicycles through the intersection.

Policy 7.4.2.c Provide street lighting that is attractive, functional, and appropriate to the character and scale of the

neighborhood or area, and that contributes to vehicular, pedestrian, and bicycle safety.

Policy 7.4.2.d Maintain roadway designs that maintain mobility and accessibility for bicyclists and pedestrians.

Policy 7.4.2.e Integrate multi-use paths into creek corridors, railroad rights-of-way, utility corridors, and park facilities.

Policy 7.4.2.f Provide, as appropriate, bicycle lanes (Class II) or parallel bicycle/pedestrian paths (Class I) along all arterial streets and high volume collector streets, as well as along major access routes to schools and parks.

Policy 7.4.2.j Permit the sharing or parallel development of pedestrian walkways with bicycle paths, where this can be safely accomplished, in order to maximize the use of public rights-of- way.

Policy 7.4.2.l Require the construction of attractive walkways in new residential, commercial, office, and industrial developments, including provision of shading for pedestrian paths.

Policy 7.4.2.m Maximize visibility and access for pedestrians, and encourage the removal of barriers for safe and convenient movement of pedestrians.

Policy 7.4.2.n Ensure that the site design of new developments provides for pedestrian access to existing and future transit routes and transit centers.

Policy 7.4.2.o Pave walks and pedestrian pathways with a hard, all-weather surface that is easy to walk on. Walks and curbs should accommodate pedestrians with disabilities. Walks within open space areas should have specially paved surfaces that blend with the surrounding environment.

Policy 7.4.2.p In general, design walks to provide a direct route for short to medium distance pedestrian trips, and to facilitate the movement of large numbers of pedestrians. Meandering sidewalks are appropriate in areas where the natural topography or low-density land uses lend themselves to informal landscapes.

Transit

Objective 7.5.1 Maintenance of rail and bus transit, providing both local and regional service that is available throughout the week, and operates on par with automobile travel during peak commute hours.

Policy 7.5.2.g Preserve options for future transit use when designing roadway and highway improvements.

Policy 7.5.2.i Include Tri-Delta Transit in the review of new development projects, and require new development to provide transit improvements in proportion to traffic demands created by the project. Transit improvements may include direct and paved access to transit stops, provision of bus turnout areas and bus shelters, and roadway geometric designs to accommodate bus traffic.

Growth Management

Objective 3.4.3 Maintain acceptable traffic levels of service on City roadways through implementation of Transportation Systems Management, Growth Management, and the City's Capital Improvement Program, and ensure that individual development projects provide appropriate mitigation for their impacts.

Policy 3.4.4.a Place ultimate responsibility for mitigating the impacts of future growth and development, including construction of new and widened roadways with individual development projects. The City's Capital Improvements Program will be used primarily to address the impacts of existing development, and to facilitate adopted economic development programs.

Policy 3.4.4.b Continue to develop and implement action plans for routes of regional significance (see Circulation Element requirements).

Policy 3.4.4.c Ensure that development projects pay applicable regional traffic mitigation fees and provide appropriate participation in relation to improvements for routes of regional significance (see also Circulation Element Policy 5.3.1f).

Policy 3.4.4.d Consider level of service standards along basic routes to be met if 20-year projections based on the City's accepted traffic model indicate that conditions at the

intersections that will be impacted by the project will be equivalent to or better than those specified in the standard, or that the proposed project has been required to pay its fair share of the improvement costs needed to bring operations at impacted intersections into conformance with the applicable performance standard.

Contra Costa Countywide Comprehensive Transportation Plan Update (2009)

The transportation policies that are currently applicable within Contra Costa County are based on the Contra Costa County Comprehensive Transportation Plan. The Plan identifies the criteria for analyzing transportation impacts and sets forth plans for future roadway improvements in the County.

4.11.4 IMPACTS AND MITIGATION MEASURES

The standards of significance to be used in identifying project-specific and cumulative impacts are presented. The standards are based on policies of the City of Antioch and other responsible agencies. In addition, the methods used to analyze the impacts of the project on the roadway, bicycle, pedestrian, and transit systems are provided in this section.

Standards of Significance

The proposed project would have a significant impact on the environment if the project would cause an increase in traffic which is substantial in relation to the traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, or delay and congestion at intersections), or change the condition of an existing street (e.g., street closures, changing direction of travel) in a manner that would substantially impact access or traffic load and capacity of the street system. Significance criteria are used to determine whether a project impact is considered significant and therefore requires mitigation. The City of Antioch strives to maintain mid-LOS D operations at signalized intersections.

The following thresholds of significance were developed based on City of Antioch and East Contra Costa County Action Plan policies, as well as the CEQA Appendix G checklist criteria:

- Would the project conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?
    - Would the operations of a study intersection not on a RRS decline from LOS mid-D (an average delay of 50 seconds for signalized intersections) or better to a high LOS D, LOS E or F, based on the HCM LOS method, with the addition of project traffic?

  - Would the project deteriorate already unacceptable operations at a signalized intersection by adding traffic?
  - Would the operations of an unsignalized study intersection decline from acceptable (as defined in Table 4.11-3) to unacceptable with the addition of project traffic, and would the installation of a traffic signal at based on the *Manual on Uniform Traffic Control Devices* (MUTCD) Peak Hour Signal Warrant (Warrant 3), be warranted?
  - Would construction traffic from the project have a significant, though temporary, impact on the environment, or would project construction substantially affect traffic flow and circulation, parking, and pedestrian safety?
- Would the project conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads and highways?
  - Would the operations of a study intersection on a RRS decline from LOS high-D (an average delay of 55 seconds for signalized intersections) or better to LOS E or F, based on the HCM LOS method, with the addition of project traffic?
  - Would the project result in or worsen unacceptable conditions on SR 4, based on delay index calculations?
- Would the operations of a study intersection on a route of regional significance decline from LOS high-D (an average delay of 55 seconds for signalized intersections) or better to LOS E or F, based on the HCM LOS method, with the addition of project traffic?
- Would the project result in or worsen unacceptable conditions on SR 4, based on delay index calculations?
- Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?
- Would the project substantially increase traffic hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?
- Would the project result in inadequate emergency access?
- Would the project conflict with adopted policies, plans, or programs regarding public transit, bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Method of Analysis

The analysis methodology provided in the TIA prepared for the proposed project by Fehr & Peers Transportation Consultants is discussed below.

Analysis Scenarios

The following analysis scenarios are included in this chapter:

- *Existing Conditions:* LOS based on existing (2014) peak hour volumes and existing (2014) intersection configurations.
- *Existing Plus Project:* Existing traffic volumes plus trips from the proposed project.
- *Near-Term Conditions:* This scenario is based on the existing volumes plus growth in background traffic (for five to ten years) plus the traffic from all reasonably foreseeable developments that could substantially affect the volumes at the project study intersections.
- *Near-Term Plus Project Conditions:* This scenario is based on the baseline traffic volumes plus the trips from the proposed project.
- *Cumulative Conditions:* This scenario includes cumulative volumes based on planned and approved projects and the most recent (March, 2013) release of the Countywide Travel Demand Model, the City of Antioch General Plan EIR, and the City of Brentwood General Plan EIR. The scenario reflects conditions over the next 20 to 25 years.
- *Cumulative Plus Project Conditions:* This scenario includes year cumulative volumes based on the most recent (March, 2013) release of the Countywide Travel Demand Model, the City of Antioch General Plan, the City of Brentwood General Plan, plus the trips from the proposed project.

Intersections

Existing operational conditions at the 10 study intersections have been evaluated according to the requirements set forth by the CCTA using the methodology set forth in the Final Technical Procedures Update (dated July 19, 2006). Analysis of traffic operations was conducted using the 2010 HCM LOS methodology with Synchro software.[2]

Signalized Intersections

The HCM methodology determines the capacity of each lane group approaching the intersection. The LOS is then based on average control delay (in seconds per vehicle) for the various movements within the intersection. A combined weighted average control delay and LOS are presented for the intersection. A summary of the HCM results and copies of the detailed HCM LOS calculations are included in the Appendix of Appendix M.

Unsignalized Intersections

The HCM describes the method for evaluating LOS and delay at unsignalized (all-way stop controlled and two-way stop controlled) intersections. LOS at unsignalized intersections is also 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 the queue. The average delay for the overall intersection is reported for all-way stop controlled intersections. The delay ranges for unsignalized intersections are lower than for signalized intersections as drivers expect less delay at unsignalized intersections.

Delay Index of SR 4

The delay index measures travel congestion and is expressed as the ratio of the time required to travel between two points during the peak hour (the congested travel time) and the time required during uncongested off-peak times. A delay index of 2.0 means that congested travel time is twice as long as during an off-peak travel time. The following shows the formula for calculating delay indices:

Delay Index = Free Flow Travel Time / Measured Peak Hour Travel Time

The denominator of the delay index formula, measured peak hour travel time, was measured by conducting speed runs along SR 4 during the AM and PM peak hours. The numerator of the delay index formula, the free flow travel time is defined as "the time it takes to traverse a roadway segment at the speed limit including the average uncongested delay experienced at traffic signals."

Project Trip Generation

The proposed project would consist of up to 650 single family residential units. The trip generation calculations are shown in Table 4.11-5. The calculations are based on the fitted curve equations for Single-Family Housing (Land Use Code 220) from the Institute of Transportation Engineer's (ITE) Trip Generation Manual, 9th Edition.

Table 4.11-5
Project Trip Generation

Land Use	Size	ADT[1]	Am Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Single-Family Housing	650 units	6,190	122	366	488	410	240	650

Notes:
[1] ADT = Average Daily Trips
Daily: T = 9.52(X)
AM: T = 0.75(X); 25 percent inbound/75 percent outbound
PM: T = 1.0(X); 63 percent inbound/37 percent outbound

Source: Fehr & Peers, 2015.

The total trip generation reflects all vehicle trips that would be counted at the project driveways, both inbound and outbound. Adjustments were not applied to trip generation to account for pass-by or internal trips because the project is residential. The project is forecast to generate approximately 488 vehicle trips during the AM peak hour and 650 trips during the PM peak hour. It should be noted that the following analysis is based on the trip generating potential of 641-units as this was the unit count at the time the analysis was conducted. Based on consultation with City staff, the addition of nine units would not change the overall analysis conclusions and any transportation fees/fair share contributions will be based on the actual number of units constructed.

Project Trip Distribution

Based on the location of the site and surrounding land uses, existing intersection and roadway operations, and the roadway network connections, project trip distribution percentages were developed. Project trips were then assigned to the roadway network based on the directions of approach and departure. Project trip assignment would change as additional roadway connections are constructed in the area.

The trip distribution assumptions have been based on the project's proximity to freeway interchanges, the existing directional split at nearby residential neighborhoods and local intersections, and the overall land use patterns in the area as determined from the most recent (March, 2013) update to the Countywide Travel Demand Model.

Existing Scenario

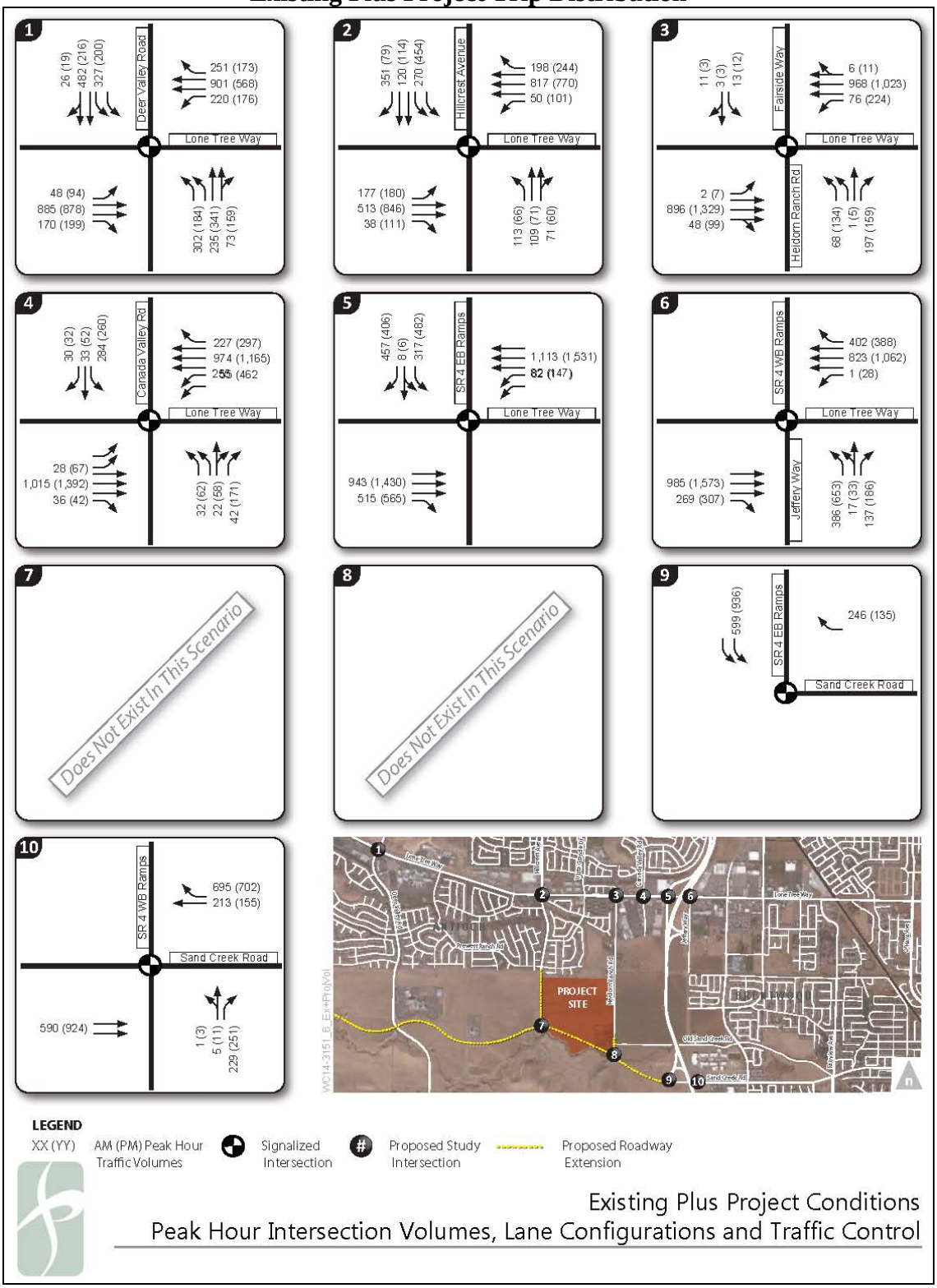
The existing scenarios include Existing (No Project) conditions and Existing Plus Project conditions. The Existing scenario includes the existing (2014) volumes based on recent traffic counts at the project study intersections. The Existing Plus Project scenario includes the existing (2014) volumes at the project study intersections plus the project-related traffic. The Existing Plus Project trip distribution is shown in Figure 4.11-2.

Near-Term Scenario

The near-term scenarios include Near-Term (No Project) conditions and Near-Term Plus Project conditions. The Near-Term scenario includes existing (2014) traffic counts plus traffic from approved and pending developments. The Near-Term Plus Project scenario includes the near-term volumes plus the project-related traffic. Therefore, the Near-Term condition represents the likely traffic levels with the completion of the proposed project. The Near-Term Plus Project trip distribution is shown in Figure 4.11-3.

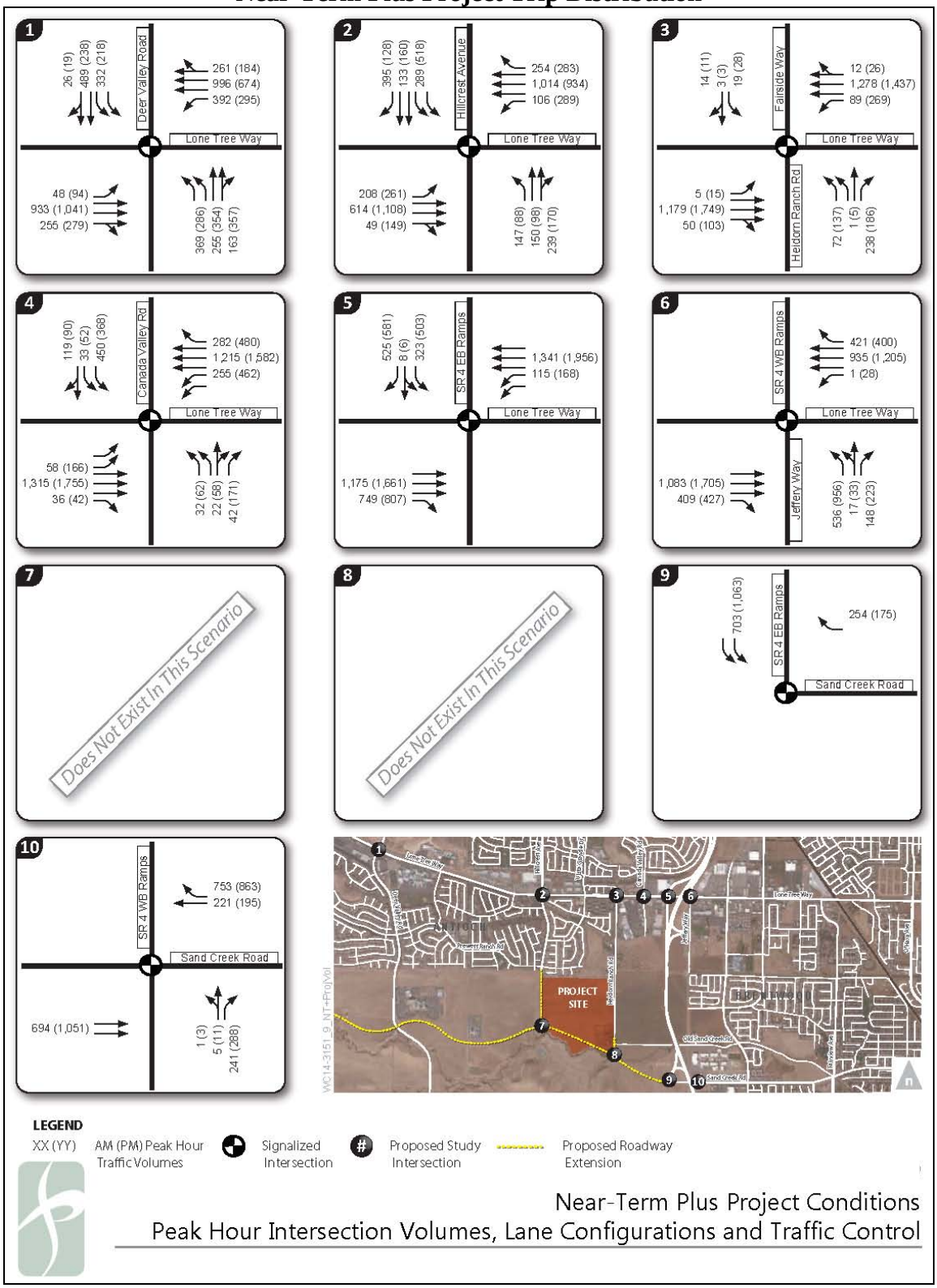
The latest *City of Brentwood Project Status Report* (April 1, 2014 for commercial projects and January 1, 2014 for residential projects) and *City of Antioch Project Pipeline* (August 28, 2014), at the time the project's Notice of Preparation (NOP) was issued, were reviewed to identify developments that could be constructed and occupied in the area over the next five to 10 years. Based on a review of the list, a number of developments were identified that could generate additional traffic through the study area. The proposed developments are summarized in Table 4.11-6, and the locations are shown on Figure 4.11-4.

Figure 4.11-2
Existing Plus Project Trip Distribution



Source: Fehr & Peers, 2015.

Figure 4.11-3
Near-Term Plus Project Trip Distribution



Source: Fehr & Peers, 2015.

Table 4.11-6
Pending and Approved Projects for the Near-Term Scenario

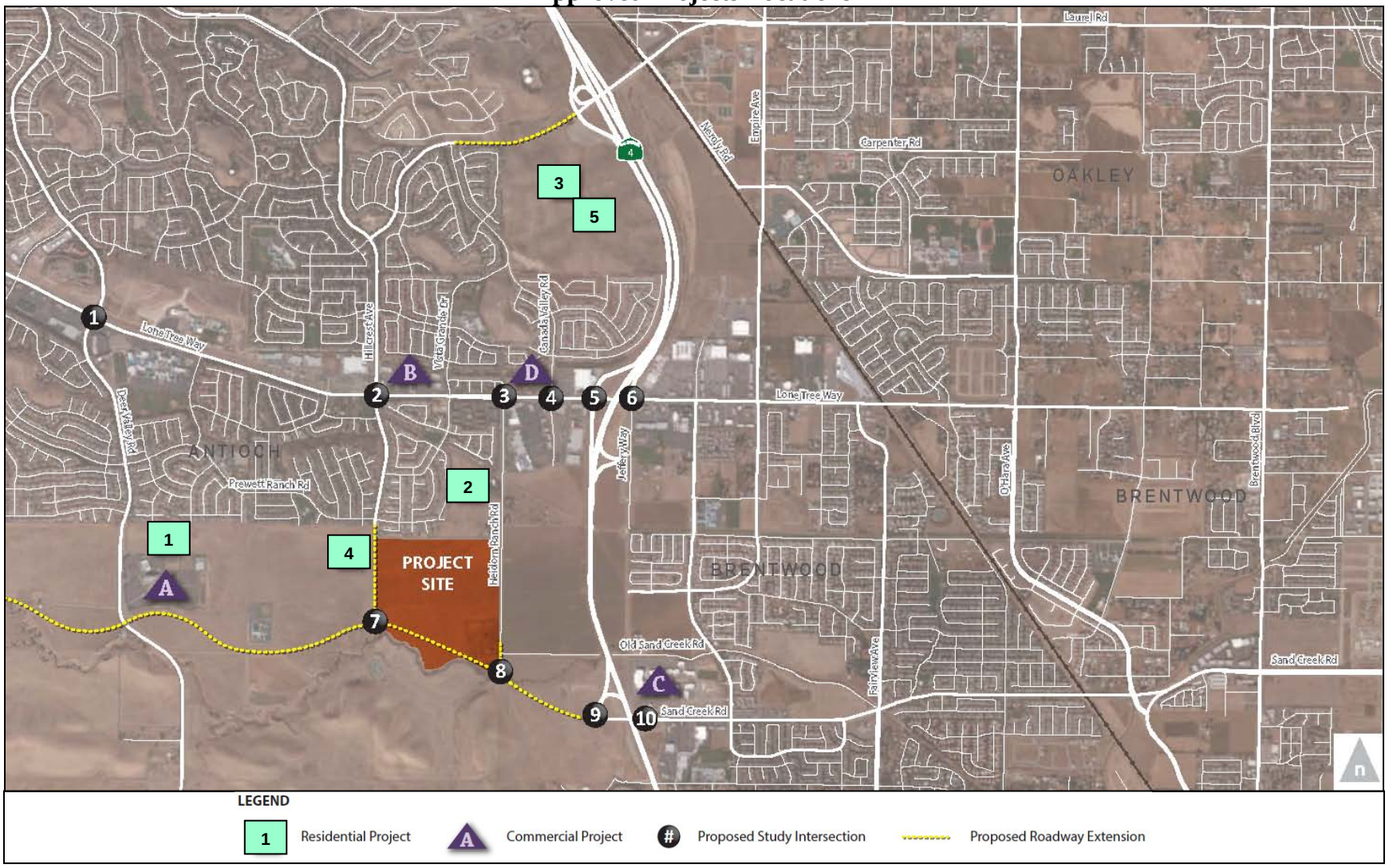
Map Location	Project Name	Size	Land Use	Status
1	Deer Valley Estates	136 dwelling units (DU)	Single Family Homes	Approved
2	Heidorn Village	117 dwelling units	Single Family Homes	Pending
3	Park Ridge	124 dwelling units	Single Family Homes	Approved
4	Aviano	553 dwelling units	Single Family Homes	Pending
5	Sand Creek Ranch	400 dwelling units 61 dwelling units	Single Family Homes Single Family Homes	Built Approved
-	Brentwood Residential	247 dwelling units	Single Family Homes	Approved/Under Construction
A	Kaiser Medical Center	653,450 square feet	Medical Center	Built
B	City Sports Club	38,000 square feet	Fitness Center	Pending
C	Streets of Brentwood	137,530 square feet	Shopping Center	Under Construction
D	AutoZone	7,930 square feet	Automobile Parts Store	Approved

Source: City of Brentwood Project Status Report (April 1, 2014 for commercial projects and January 1, 2014 for residential projects) and City of Antioch Project Pipeline (August 28, 2014).

Cumulative Scenario

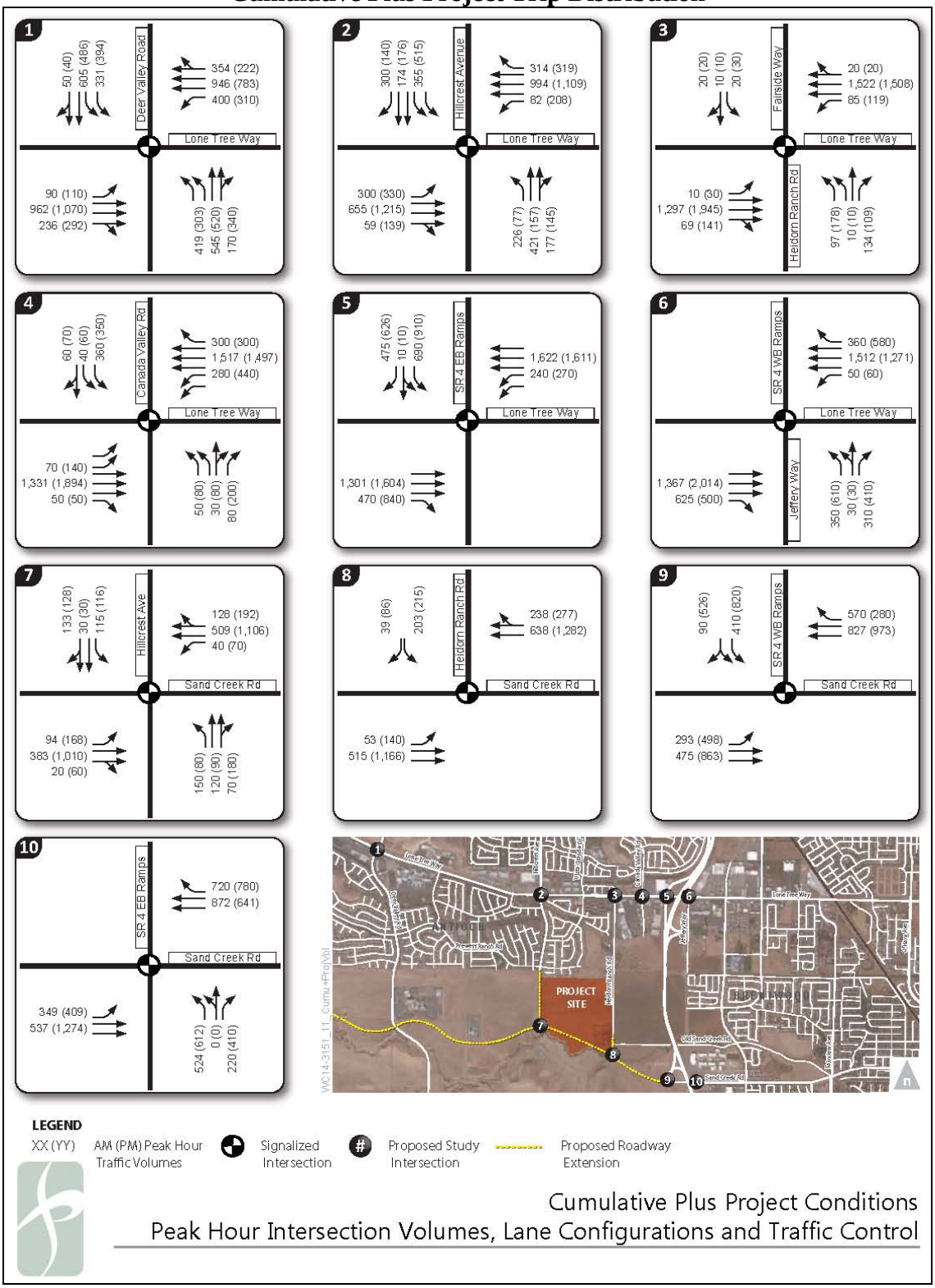
Forecasts for the cumulative scenario are based on traffic growth trends as described in both the Antioch and Brentwood General Plan EIR, and are supplemented by a check of traffic forecasts for the study area in the most recent Contra Costa Countywide Travel Demand Model.[3] The scenario reflects conditions over the next 20 to 25 years. In the cumulative condition, Sand Creek Road would form the southern boundary of the site although vehicle access is not proposed from Sand Creek Road. The construction of the Sand Creek Road extension would provide additional roadway connections to the surrounding roadway system. The Cumulative Plus Project trip distribution is shown in Figure 4.11-5.

Figure 4.11-4
Approved Projects Locations



Source: Fehr & Peers, 2015.

Figure 4.11-5
Cumulative Plus Project Trip Distribution



Source: Fehr & Peers, 2015.

Project-Specific Impacts and Mitigation Measures

The proposed project impacts on the transportation system are evaluated in this section based on the thresholds of significance and methodology described above. Each impact is followed by recommended mitigation to reduce the identified impacts, if needed.

4.11-1 Traffic related to construction activities. Based on the analysis below and with implementation of mitigation, the impact would be *less than significant.*

Detailed information related to the construction schedule during site development was not available at the time the TIA was prepared. The increase in traffic as a result of construction activities associated with the proposed project has been quantified using information from similar residential developments.

Given the topography of the site, limited import or export of fill is expected. Truck traffic would follow designated truck routes and project construction would stage any large vehicles (i.e., earth-moving equipment, cranes, etc) on the site prior to beginning site work. The large vehicles would be removed upon project completion. As such, a daily influx of construction equipment is not anticipated.

Detailed information relating to the construction schedule during site development or a construction management plan is not available. Based on information from other residential developments, approximately five workers per day would be needed for each home under construction, with one to two deliveries per week of materials for each home. Not all homes are expected to be under construction at the same time and construction workers tend to arrive/depart work sites outside typical commute periods. Assuming ten percent of homes would be under construction at the peak of project construction, 326 workers could be on-site at one time (65 homes with five workers for each home), plus additional workers, such as building inspectors, foreman, and others. Maximum site activity could result in 600 to 700 daily trips to/from the site, which is less than would be generated by the project at completion.

Prior to issuance of grading and building permits, the project applicant would be required to submit a Traffic Control Plan. The requirements within the Traffic Control Plan include, but are not limited to, the following: truck drivers would be notified of and required to use the most direct route between the site and SR 4, as determined by the City Engineering Department; all site ingress and egress would occur only at the main driveways to the project site and construction activities may require installation of temporary (or ultimate) traffic signals as determined by the City Engineer; specifically designated travel routes for large vehicles would be monitored and controlled by flaggers for large construction vehicle ingress and egress; warning signs indicating frequent truck entry and exit would likely be posted on Hillcrest Avenue and Heidorn Ranch Road; and any debris and mud on nearby streets caused by trucks would be monitored daily and may require instituting a street cleaning program. In addition, the loads of heavy equipment being hauled to and from the site would be short-term.

Although construction would be temporary, impacts may result during the construction phase of the project when heavy-duty construction vehicles share the roadway with normal vehicle traffic, creating potential conflicts with other roadway users. Therefore, without a Traffic Control Plan, the construction activities associated with the proposed project could result in a ***potentially significant*** impact.

Mitigation Measure(s)
Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

4.11-1 *Prior to issuance of grading and building permits, the developer shall submit a Traffic Control Plan, subject to review and approval by the City Engineer. The requirements within the Traffic Control Plan shall include, but are not necessarily limited to, the following:*

- *Project staging plan to maximize on-site storage of materials and equipment;*
- *A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak hours; lane closure proceedings; signs, cones, and other warning devices for drivers; and designation of construction access routes;*
- *Permitted construction hours;*
- *Identification of parking areas for construction employees, site visitors, and inspectors, including on-site locations; and*
- *Provisions for street sweeping to remove construction-related debris on public streets.*

4.11-2 Study roadway intersections and freeway facilities under Existing Plus Project conditions. Based on the analysis below, the impact is *less than significant.*

The development of up to 650 single family units for the proposed project would result in an increase in 6,190 average daily vehicle trips in the project area. Table 4.11-7 and Table 4.11-8 below show the Existing and Existing Plus Project delay and LOS for study intersections and study freeway facilities, respectively.

As shown in Table 4.11-7, the addition of project traffic would increase average delay at the study intersections slightly, but would not cause overall intersection operations to degrade beyond the established LOS standard. As shown in Table 4.11-8, although the project would increase traffic on SR 4, the project would not result in degradation of freeway operations below the established standard. Therefore, impacts to the study roadway intersections and freeway facilities as a result of the project would be ***less than significant***.

Mitigation Measure(s)
None required.

Table 4.11-7
Intersection LOS – Existing Plus Project Conditions

Intersection	Control[1]	Peak Hour	Existing		Existing Plus Project	
			Delay[2]	LOS	Delay[2]	LOS
1. Lone Tree Way at Deer Valley Rd.	Signal	AM	48	D	49	D
		PM	40	D	42	D
2. Lone Tree Way at Hillcrest Ave.	Signal	AM	31	C	38	D
		PM	22	C	25	C
3. Lone Tree Way at Heidorn Ranch Rd.	Signal	AM	5	A	11	B[3]
		PM	6	A	14	B[3]
4. Lone Tree Way at Canada Valley Rd.	Signal	AM	30	C	31	C
		PM	39	D	35	C
5. Lone Tree Way at SR 4 EB Ramps	Signal	AM	24	C	26	C
		PM	22	C	27	C
6. Lone Tree Way at SR 4 WB Ramp/Jeffery Ave.	Signal	AM	18	B	19	B
		PM	24	C	27	C
9. Sand Creek Rd. at SR 4 EB Ramps	Signal	AM	20	B	20	B
		PM	18	B	18	B
10. Sand Creek Rd. at SR 4 WB Ramps	Signal	AM	13	B	13	B
		PM	12	B	12	B

Notes:
[1] Signal = signalized intersection *(Continued on next page)*
[2] Average intersection delay is calculated for all signalized intersections using the 2010 HCM method for vehicles. For SSSC intersections, delay presented for intersection average (worst movement).
[3] Signal timing was assumed to be retimed to better accommodate increased traffic flows to/from Heidorn Ranch Road.

Source: Fehr & Peers, 2015.

Table 4.11-8
Existing Plus Project Freeway Conditions

Segment	Direction	Peak Hour	Existing		Existing Plus Project	
			Volume	Delay Index	Volume	Delay Index
South of Sand Creek Road	NB/WB	AM	1,325	1.8	1,356	1.8
		PM	1,638	1.9	1,741	2.0
Between Sand Creek Road and Lone Tree Way	NB/WB	AM	1,773	1.0	1,816	1.0
		PM	2,034	1.0	2,178	1.0
North Lone Tree Way	NB/WB	AM	1,858	1.0	1,931	1.0
		PM	1,934	1.0	1,982	1.0
North Lone Tree Way	SB/EB	AM	2,026	1.0	2,050	1.0
		PM	2,448	1.0	2,530	1.0
Between Sand Creek Road and Lone Tree Way	SB/EB	AM	1,791	1.0	1,919	1.0
		PM	2,284	1.0	2,368	1.0
South of Sand Creek Road	SB/EB	AM	1,475	1.8	1,567	1.8
		PM	1,507	1.9	1,567	2.0

Notes: NB/WB = Northbound/Westbound, SB/EB = Southbound/Eastbound

Source: Fehr & Peers, 2015.

4.11-3 Study roadway intersections and freeway facilities under Near-Term Plus Project conditions. Based on the analysis below, the impact is *less than significant*.

For the Near-Term condition, the analysis assumes Hillcrest Avenue would be extended south along the western project frontage to provide access to the Aviano development, and the proposed project would have constructed the portion of Hillcrest Avenue along the project frontage. In the Near-Term condition, Lone Tree Way is planned to be restriped to provide three through lanes in both the eastbound and westbound directions from west of Deer Valley Road to Hillcrest Avenue. At the Lone Tree Way/Deer Valley Road intersection, the third westbound through lane would become a second westbound left-turn lane. The Lone Tree Way/Canada Valley Road intersection will also be modified to provide dual southbound left-turn lanes and through/right shared lane.

The Near-Term condition evaluates the Existing Conditions with the addition of traffic from reasonably foreseeable projects in the area, including traffic from the approved projects list include in Table 4.11-6. The analysis results are presented in Table 4.11-9. Intersections in the vicinity of the project site are expected to continue operating at acceptable service levels with construction and occupation of approved and pending projects in the vicinity of the site. With the addition of project traffic, intersections would continue to operate at acceptable service levels.

Near-Term and Near-Term Plus Project freeway operations are presented in Table 4.11-10.

In the Near-Term condition, travel speeds are expected to remain free-flow north of Sand Creek Road. South of Sand Creek Road, average travel time would slightly increase, but would remain within the established standard. Although the project would further increase traffic on SR 4 in the Near-Term condition, the increase would not degrade operations beyond the standard established by the East County Action Plan.

As shown in Table 4.11-10, although the project would increase traffic on SR 4, the project would not result in degradation of freeway operations below the established standard. Therefore the proposed project would have a ***less-than-significant*** impact to study intersections and freeway operations.

Mitigation Measure(s)
None required.

Table 4.11-9
Intersection LOS – Near-Term Plus Project Conditions

Intersection	Control[1]	Peak Hour	Near-Term		Near-Term Plus Project[4]	
			Delay[2]	LOS	Delay[2]	LOS
1. Lone Tree Way at Deer Valley Rd.	Signal	AM	51	D	53	D
		PM	45	D	48	D
2. Lone Tree Way at Hillcrest Ave.	Signal	AM	33	C	38	D
		PM	38	D	50	D
3. Lone Tree Way at Heidorn Ranch Rd.	Signal	AM	5	A	11	B
		PM	7	A	15	B
4. Lone Tree Way at Canada Valley Rd.	Signal	AM	31	C	32	C
		PM	36	D	32	C
5. Lone Tree Way at SR 4 EB Ramps	Signal	AM	37	D	39	D
		PM	34	C	40	D
6. Lone Tree Way at SR 4 WB Ramp/Jeffery Ave.	Signal	AM	28	C	30	C
		PM	33	C	36	D
9. Sand Creek Rd. at SR 4 EB Ramps	Signal	AM	19	B	19	B
		PM	16	B	16	B
10. Sand Creek Rd. at SR 4 WB Ramps	Signal	AM	16	B	16	B
		PM	18	B	19	B

Notes:
[1] Signal = signalized intersection
[2] Average intersection delay is calculated for all signalized intersections using the 2010 HCM method for vehicles.
[3] Signal timing was assumed to be retimed to better accommodate increased traffic flows to/from Heidorn Ranch Road in the With Project condition.
[4] Reflects trip generating potential of 641 single-family homes.

Source: Fehr & Peers, 2015.

4.11-4 Alternative transportation facilities. Based on the analysis below, the impact is *less than significant.*

The project would provide five-foot-wide sidewalks on all internal roadways on at least one side of the street. The project site would have a sound wall surrounding the development which would restrict pedestrian permeability to the surrounding neighborhoods and to the Sand Creek Trail.

Bicycle and Pedestrian System

As noted above, the project would provide five-foot-wide sidewalks on at least one side of all internal roadways and six-foot-wide sidewalks on the portions of Hillcrest Avenue and Heidorn Ranch Road along the project frontage. The project would be a gated community and pedestrian access would be restricted to residents and their guests to the vehicular entries. Should future residents request increased pedestrian access to the Sand Creek Trail, it would be feasible to convert a fence near the park in the southeast portion of the site to pedestrian gate.

Table 4.11-10
Near-Term Plus Project Freeway Conditions

Segment	Direction	Peak Hour	Near-Term		Near-Term Plus Project[1]	
			Volume	Delay Index	Volume	Delay Index
South of Sand Creek Road	NB/WB	AM	1,568	2.0	1,599	2.1
		PM	1,809	2.1	1,912	2.2
Between Sand Creek Road and Lone Tree Way	NB/WB	AM	2,099	1.0	2,142	1.0
		PM	2,247	1.0	2,391	1.0
North Lone Tree Way	NB/WB	AM	2,199	1.0	2,272	1.0
		PM	2,136	1.0	2,184	1.0
North Lone Tree Way	SB/EB	AM	2,398	1.0	2,422	1.0
		PM	2,704	1.0	2,786	1.0
Between Sand Creek Road and Lone Tree Way	SB/EB	AM	2,120	1.0	2,248	1.0
		PM	2,523	1.0	2,607	1.0
South of Sand Creek Road	SB/EB	AM	1,746	2.0	1,838	2.1
		PM	1,665	2.1	1,725	2.2

Notes: NB/WB = Northbound/Westbound, SB/EB = Southbound/Eastbound
[1] Reflects trip generating potential of 641 single-family homes.

Source: Fehr & Peers, 2015.

As part of the project, Class II bicycle lanes would be constructed on Hillcrest Avenue, Heidorn Ranch Road, and Sand Creek Road, which would provide project connectivity with the surrounding neighborhoods. In addition, a Class I facility would parallel Sand Creek Road in the cumulative condition. Bicycle detection should be incorporated into new traffic signals in the area.

Transit System

Transit service is not currently provided in the area. An eBART station may be constructed within the median of SR 4 between Lone Tree Way and Sand Creek Road, approximately ¼-mile east of the project site. TriDelta Transit has requested the provision of bus turnouts on Hillcrest Avenue and Heidorn Ranch Road at the project entries. However, the proposed project includes bus turnouts along the project frontages, as shown on the tentative map.

Conclusion

The proposed project would generate an increase in population that would increase the demand on transit, bicycle and pedestrian systems in the area. However, the proposed project includes bus turnouts. Therefore, the proposed project would not conflict with any plans or policies for alternative transit and a ***less-than-significant*** impact would result.

Mitigation Measure(s)
None required.

4.11-5 Site access, circulation, and emergency access. Based on the analysis below and with implementation of mitigation, the impact is *less than significant.*

The proposed residential development would have two side-street stop-controlled entrances: one on Heidorn Ranch Road and the other on Hillcrest Avenue. See Table 4.11-11 for the operations of the access locations for the cumulative condition.

Based on the projected intersection operations and traffic volumes at the project entries, the northbound left-turn pocket from Heidorn Ranch Road and the southbound left-turn pocket from Hillcrest Avenue shall be designed to provide approximately 75 to 100 feet of vehicle storage, plus the taper length.

Table 4.11-11
Peak Hour Site Access LOS Summary

Project Entry	Control[1]	Peak Hour	Cumulative With Project	
			Delay[2]	LOS
Heidorn Ranch Road	SSSC	AM	14	B
		PM	14	B
Hillcrest Avenue	SSSC	AM	14	B
		PM	19	B

Notes:
[1] SSSC = side-street stop-control
[2] Delay is presented for intersection average (side-street movement), based on the 2010 HCM method for vehicles.

Source: Fehr & Peers, 2015.

Site Access and Circulation

The project site plan includes various north-south and east-west roadways in a modified grid system. The main east-west spine connects Hillcrest Avenue to Heidorn Ranch Road. Where north-south streets intersect the main roadway, the side-streets are anticipated to be stop-controlled. As future conditions dictate, all-way stop-control could be installed at some internal intersections.

Several of the north-south roadways have block lengths between 600 and 1,000 feet prior to an intersection or roadway curve. Speed humps are proposed to be installed on all streets greater than 600 feet throughout the site. City Design Guidelines encourage shorter block lengths, with the City of Antioch Municipal Code specifying that block lengths cannot be longer than 1,000 feet.

The major east-west roadway through the site would provide a 20-foot pavement cross section in each direction along with a ten- to 16-foot median within a 90-foot right-of-

way. The right-of-way is increased to 130-feet at the widest part of the project entries. A five to eleven-foot landscape buffer between the street and sidewalk, a five foot sidewalk, and a ten-foot landscape buffer between the sidewalk and fence line would be provided on each side of the street.

Other streets through the site would have a 56-foot right-of-way, including a 36-foot pavement cross section, facilitating two-way travel plus parking on both sides of the street in addition to a seven to eight-foot landscape buffer and a five-foot sidewalk on one side of the street.

Emergency Access

Several factors determine whether a project has sufficient access for emergency vehicles, including:

1. Number of access points (both public and emergency access only);
2. Width of access points; and
3. Width of internal roadways.

The project site plan shows two vehicle access points for emergency vehicles at the entrances from Heidorn Ranch Road and Hillcrest Avenue. If one of the aforementioned roadways was blocked or obstructed, emergency vehicles would have an alternative route to access the site. The project entry points provide a 28-foot clear way in each direction, which is sufficient width to accommodate emergency vehicle access.

Conclusion

As noted above, the two access intersections would operate within acceptable levels of service. However, the Traffic Impact Study recommends specific turn-pocket dimensions for the proposed Hillcrest Avenue and Heidorn Ranch Road intersections. Therefore, impacts related to site access and circulation to the proposed project could be ***potentially significant*** without implementation of recommendations.

Mitigation Measure(s)
Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

4.11-5 *Prior to approval of Improvement Plans, the Improvement Plans shall show that the northbound left-turn pocket from Heidorn Ranch Road and the southbound left-turn pocket from Hillcrest Avenue shall be designed to provide approximately 75 to 100 feet of vehicle storage, plus the taper length. The Improvement Plans shall be subject to review and approval by the City Engineer.*

Cumulative Impacts and Mitigation Measures

As mentioned above, the Cumulative scenario traffic conditions at each of the project study intersections are based on the existing turning movements with the addition of traffic from all planned and approved projects and the most recent (March, 2013) release of the Countywide Travel Demand Model, the City of Antioch General Plan EIR, and the City of Brentwood General Plan EIR. The scenario reflects conditions over the next 20 to 25 years.

To assess future growth of planned development in both the Cities of Antioch and Brentwood, several sources of data were reviewed, including the Contra Costa County Travel Demand Model (CCTA Model), future projections from the City of Brentwood General Plan Environmental Impact Report, and projections developed as part of the Aviano transportation impact study.

For the analysis of Cumulative conditions, the extension of Sand Creek Road from the existing terminus at SR 4 to Deer Valley Road was assumed. In addition, the extension of Hillcrest Avenue and Heidorn Ranch Road to Sand Creek Road was assumed. Furthermore, improvements along the SR 4 corridor to provide two travel lanes in each direction between Balfour Road and Sand Creek Road were assumed. Further upgrades to the Sand Creek Road/SR 4 interchange are planned, but were not assumed in the analysis of Cumulative conditions.

Cumulative impacts of the proposed project on the transportation system are identified in this section. Each impact is followed by any recommended mitigation measures to reduce the significance of identified impacts.

4.11-6 Study roadway intersections and freeway facilities under Cumulative Plus Project conditions. Based on the analysis below and with implementation of mitigation, the impact would be less than *significant.*

Table 4.11-12 summarizes the LOS results for Cumulative conditions and Cumulative Plus Project conditions for each of the project study intersections. The proposed project trips were added to the cumulative traffic volumes for the Cumulative Plus Project conditions. As shown in the table, one intersection is projected to operate deficiently in the cumulative condition prior to the addition of project traffic:

- Sand Creek Road at SR 4 EB Ramps – LOS E PM Peak Hour

The addition of project traffic would increase delay to the above intersection by approximately 16 seconds in the PM peak hour. All other study intersections are projected to operate at acceptable service levels. Therefore, a potentially significant cumulative impact would result to Sand Creek Road/SR 4 EB Ramps intersection under the Cumulative Plus Project conditions.

Table 4.11-12
Intersection LOS – Cumulative Plus Project Conditions

Intersection	Control[1]	Peak Hour	Cumulative		Cumulative Plus Project	
			Delay[2]	LOS	Delay[2]	LOS
1. Lone Tree Way at Deer Valley Rd.	Signal	AM	48	D	49	D
		PM	50	D	51	D
2. Lone Tree Way at Hillcrest Ave.	Signal	AM	41	D	44	D
		PM	40	D	43	D
3. Lone Tree Way at Heidorn Ranch Rd.	Signal	AM	7	A	9	A
		PM	8	A	12	B
4. Lone Tree Way at Canada Valley Rd.	Signal	AM	30	C	30	C
		PM	41	D	40	D
5. Lone Tree Way at SR 4 EB Ramps	Signal	AM	31	C	30	C
		PM	42	D	41	D
6. Lone Tree Way at SR 4 WB Ramp/Jeffery Ave.	Signal	AM	28	C	29	C
		PM	25	C	25	C
7. Sand Creek Rd. at Hillcrest Ave.	Signal	AM	21	C	22	C
		PM	19	B	25	C
8. Sand Creek Rd. at Heidorn Ranch Rd.	Signal	AM	9	A	12	B
		PM	12	B	12	B
9. Sand Creek Rd. at SR 4 EB Ramps	Signal	AM	36	D	38	D
		PM	**77**	**E**	**93**	**F**
10. Sand Creek Rd. at SR 4 WB Ramps	Signal	AM	26	C	28	C
		PM	28	C	31	C

Notes:
Bold indicates deficient operations.
[1] Signal = signalized intersection
[2] Average intersection delay is calculated for all signalized intersections using the 2010 HCM method for vehicles.
[3] Analysis reflects trip generating potential of 641 single-family homes.

Source: Fehr & Peers, 2015.

The Cumulative freeway operations were evaluated based on the estimates of cumulative traffic plus project-generated traffic and the results are presented in Table 4.11-13. In the Cumulative condition with planned improvements along the SR 4 corridor, travel speeds are expected to be generally free-flow through the study area. Although the project would further increase traffic on SR 4 in the Cumulative condition, planned improvements would allow the freeway to operate with acceptable levels of congestion during peak hours. Nevertheless, due to the potentially significant cumulative impact to the Sand Creek Road/SR 4 EB Ramps intersection under the Cumulative Plus Project condition, a ***potentially significant*** impact could result.

Table 4.11-13
Cumulative Plus Project Freeway Conditions

Segment	Direction	Peak Hour	Cumulative		Cumulative Plus Project	
			Volume	Delay Index	Volume	Delay Index
South of Sand Creek Road	NB/WB	AM	1,820	1.0	1,851	1.0
		PM	1,921	1.0	2,024	1.0
Between Sand Creek Road and Lone Tree Way	NB/WB	AM	2,435	1.0	2,478	1.0
		PM	2,385	1.0	2,529	1.0
North Lone Tree Way	NB/WB	AM	2,552	1.0	2,625	1.0
		PM	2,268	1.0	2,316	1.0
North Lone Tree Way	SB/EB	AM	2,783	1.0	2,807	1.0
		PM	2,871	1.0	2,953	1.0
Between Sand Creek Road and Lone Tree Way	SB/EB	AM	2,460	1.0	2,588	1.0
		PM	2,679	1.0	2,763	1.0
South of Sand Creek Road	SB/EB	AM	2,026	1.0	2,118	1.0
		PM	1,767	1.0	1,827	1.0

Notes: NB/WB = Northbound/Westbound, SB/EB = Southbound/Eastbound

Source: Fehr & Peers, 2015.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level (see Table 4.11-14).

Table 4.11-14
Cumulative Intersection LOS - with and without Mitigation

Intersection	Peak Hour	Cumulative		Cumulative Plus Project		Cumulative Plus Project with Mitigation	
		Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS
9. Sand Creek Rd. at SR 4 EB Ramps	AM	36	D	38	D	19	B
	PM	**77**	**E**	**93**	**F**	23	C

Notes:
Bold indicates deficient operations.
[1] Average intersection delay is calculated for all signalized intersections using the 2010 HCM method for vehicles.

Source: Fehr & Peers, 2015.

4.11-6 Prior to issuance of a building permit, the project applicant shall pay regional transportation impact fees to the East Contra Costa Regional Fee and Financing Authority (ECCRFFA) that would fund construction of additional improvements at the Sand Creek Road interchange, which includes a slip-ramp for the eastbound Sand Creek to southbound State Route 4 movement, eliminating the conflicting left-turn movement at the

intersection. Construction of this improvement would result in acceptable operations (as shown in Table 4.11-14).

Endnotes

[1] Fehr & Peers. *Vineyards at Sand Creek Residential, Transportation Impact Assessment*. March 2015.
[2] Transportation Research Board. *2010 Highway Capacity Manual (HCM)*. 2011.
[3] Contra Costa Transportation Authority. Countywide Travel Demand Model. March 2013.

5. STATUTORILY REQUIRED SECTIONS

5 STATUTORILY REQUIRED SECTIONS

5.1 Introduction

The Statutorily Required Sections chapter of the EIR includes brief discussions regarding those topics that are required to be included in an EIR, pursuant to *CEQA Guidelines*, Section 15126.2. The chapter includes a discussion of the proposed project's potential to induce economic or population growth. In addition, the chapter includes lists of cumulative impacts, energy impacts, significant irreversible environmental changes, and significant and unavoidable impacts caused by the proposed project.

5.2 Growth-Inducing Impacts

An EIR must discuss the ways in which a proposed project could foster economic or population growth in the vicinity of the project and how that growth would, in turn, affect the surrounding environment (see *CEQA Guidelines,* Section 15126.2[d]). Growth can be induced in a number of ways, including through the elimination of obstacles to growth or through the stimulation of economic activity within the region. The discussion of the removal of obstacles to growth relates directly to the removal of infrastructure limitations or regulatory constraints that could result in growth unforeseen at the time of project approval.

A number of issues must be considered when assessing the growth-inducing effects of development plans, such as the proposed project, including the following:

> **Elimination of Obstacles to Growth:** The extent to which infrastructure capacity provided to accommodate the proposed project would allow additional development in surrounding areas; and
>
> **Economic Effects**: The extent to which development of the proposed project could cause increased activity in the local or regional economy.

Growth-inducing impacts associated with the proposed project would be considered to be any effects of the project allowing for additional growth or increases in population beyond that proposed by the project or anticipated in the Antioch General Plan.

The proposed project consists of a residential development, including up to 650 single-family residential units on 127.5 acres; 31.6 acres of parks and landscaped areas; extension of Heidorn Ranch Road, Hillcrest Avenue, and Sand Creek Road; extension of a portion of the Sand Creek Trail for connection to other City and regional trails with associated parking; and utility improvements. The project applicant is seeking approval of the following by the City of Antioch at this time: a General Plan Amendment of the Sand Creek Focus Area from Business Park, Public/Quasi-Public, and Open Space/Senior Housing designations to Medium Low Density

Residential; a Master Development Plan, Final Development Plan, and Planned Development Rezone; Tentative Map Approval; and a Development Agreement.

As discussed in further detail in Chapter 4.10, Public Services, Recreation, and Utilities, of this EIR, the project could introduce approximately 1,950 new residents to the City of Antioch, which would directly induce population in the area. However, the project site is planned for urban development by the Antioch General Plan. Although public services would be different for residential development than a business park, the existing infrastructure near the project site would be modified to accommodate the proposed development. In addition, the proposed infrastructure has been sized as needed for buildout of the General Plan and consistent with the City's Infrastructure Master Plans.

A physical obstacle to growth typically involves the lack of public service infrastructure. The extension of public service infrastructure, including roadways, water mains, and sewer lines, into areas that are not currently provided with these services, would be expected to support new development. Similarly, the elimination or change to a regulatory obstacle, including existing growth and development policies, could result in new growth. The primary infrastructure systems installed as part of the proposed project would be sized to meet demands created by the proposed project. In addition, as discussed in further detail in Chapter 4.8, Land Use and Planning / Agricultural Resources of this EIR, in order to ensure that population growth does not outpace availability of adequate infrastructure, should the Antioch City Council approve the General Plan Amendment, the single-family and open space uses proposed for the project site would be consistent with the General Plan land use designations.

Therefore, because the growth associated with development of the project site is consistent with what was anticipated by the City of Antioch, and the infrastructure required for the proposed project would be sized to meet the demands created by the project and consistent with the City's Master Plans, the proposed project would not be expected to generate any new growth-inducing impacts beyond those identified in this EIR as impacts of the project.

5.3 CUMULATIVE IMPACTS

CEQA Guidelines, Section 15130 requires that an EIR discuss the cumulative and long-term effects of the proposed project that adversely affect the environment. "Cumulative impacts" are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (*CEQA Guidelines*, Section 15355). "[I]ndividual effects may be changes resulting from a single project or a number of separate projects" (*CEQA Guidelines*, Section 15355, subd. [a]). "The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time" (*CEQA Guidelines*, Section 15355, subd. [b]).

The need for cumulative impact assessment reflects the fact that, although a project may cause an "individually limited" or "individually minor" incremental impact that, by itself, is not

significant, the increment may be "cumulatively considerable," and, thus, significant, when viewed together with environmental changes anticipated from past, present, and probable future projects (*CEQA Guidelines*, Section 15064, subd. [h(1)], Section 15065, subd. [c], and Section 15355, subd. [b]). Accordingly, particular impacts may be less than significant on a project-specific basis but significant on a cumulative basis if their small incremental contribution, viewed against the larger backdrop, is cumulatively considerable. However, it should be noted that *CEQA Guidelines*, Section 15064, Subdivision (h)(5) states, "[…]the mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable." Therefore, even where cumulative impacts are significant, any level of incremental contribution is not necessarily deemed cumulatively considerable.

Section 15130(b) of *CEQA Guidelines* indicates that the level of detail of the cumulative analysis need not be as great as for the project impact analyses, but that analysis should reflect the severity of the impacts and their likelihood of occurrence, and that the analysis should be focused, practical, and reasonable. To be adequate, a discussion of cumulative effects must include the following elements:

> (1) Either (a) a list of past, present and probable future projects, including, if necessary, those outside the agency's control, or (b) a summary of projections contained in an adopted general plan or related planning document, or in a prior certified EIR, which described or evaluated regional or area-wide conditions contributing to the cumulative impact, provide that such documents are reference and made available for public inspection at a specified location;
>
> (2) A summary of the individual projects' environmental effects, with specific reference to additional information and stating where such information is available; and
>
> (3) A reasonable analysis of all of the relevant projects' cumulative impacts, with an examination of reasonable, feasible options for mitigating or avoiding the project's contribution to such effects (Section 15130[b]).

For some projects, the only feasible mitigation measures will involve the adoption of ordinances or regulations, rather than the imposition of conditions on a project-by-project basis (Section 15130[c]). Section 15130(a)(3) states that an EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable, and thus not significant, if a project is required to implement or fund the project's fair share of a mitigation measure or measures designed to alleviate the cumulative impact.

Cumulative Setting

The lead agency should define the relevant geographic area of inquiry for each impact category (id., Section 15130, subd. [b][3]), and should then identify the universe of "past, present, and probable future projects producing related or cumulative impacts" relevant to the various categories, either through the preparation of a "list" of such projects or through the use of "a summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or

evaluated regional or area wide conditions contributing to the cumulative impact" (id., subd. [b][1]).

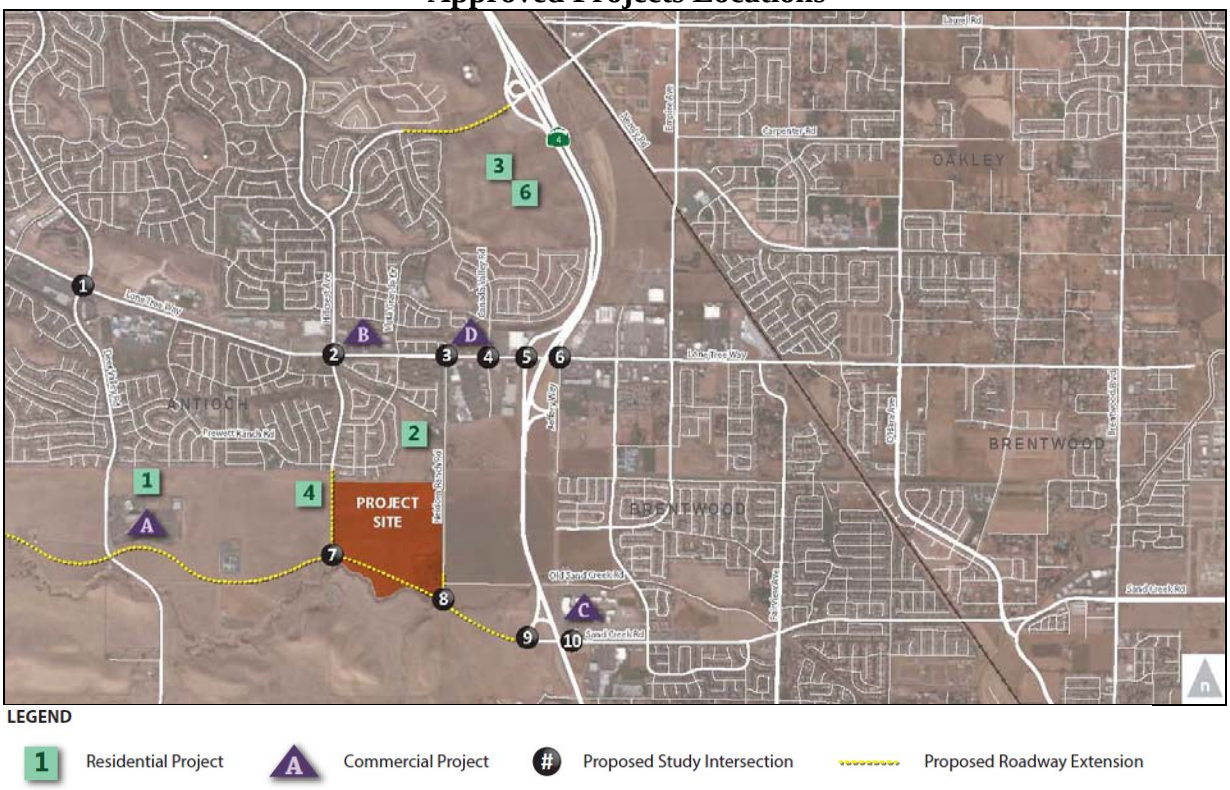
The proposed project, in conjunction with development in the vicinity of the project site and within the region, would contribute to cumulative environmental impacts. The cumulative analysis for the proposed project is based on the Antioch General Plan buildout, the development included in the CCTA traffic model, as well as present and probable future projects within the region. The latest *City of Brentwood Project Status Report* (April 1, 2014 for commercial projects and January 1, 2014 for residential projects) and *City of Antioch Project Pipeline* (August 28, 2014) as of the date of the Notice of Preparation for this EIR were reviewed to identify developments that could be constructed and occupied in the area over the next five to 10 years. The reasonably probable future development projects are summarized in Table 5-1 (Pending and Approved Projects Summary) and the locations are shown on Figure 5-1 (Approved Projects Locations) Cumulative impacts are analyzed within each technical chapter are summarized below.

Table 5-1
Pending and Approved Projects Summary

Map Location	Project Name	Size	Land Use	Status
1	Deer Valley Estates	136 dwelling units (DU)	Single Family Homes	Approved
2	Heidorn Village	117 dwelling units	Single Family Homes	Pending
3	Park Ridge	525 dwelling units	Single Family Homes	Approved
4	Aviano	553 dwelling units	Single Family Homes	Pending
5	Sand Creek Ranch	400 dwelling units 61 dwelling units	Single Family Homes Single Family Homes	Built Approved
-	Brentwood Residential	247 dwelling units	Single Family Homes	Approved/Under Construction
A	Kaiser Medical Center	653,450 square feet 336,550 square feet	Medical Center	Built Approved
B	City Sports Club	38,000 square feet	Fitness Center	Pending
C	Streets of Brentwood	137,530 square feet	Shopping Center	Under Construction
D	AutoZone	7,930 square feet	Automobile Parts Store	Approved

Sources: City of Brentwood Project Status Report (April 1, 2014 for commercial projects and January 1, 2014 for residential projects), City of Antioch Project Pipeline (August 28, 2014), and personal communications with Harold Jirousky, Associate Engineer, Public Works Department (April 24, 2015).

Figure 5-1
Approved Projects Locations



Cumulative Impacts

Cumulative impacts are analyzed in each of the technical chapters of this EIR (Chapters 4.1 through 4.11) and are summarized below.

Aesthetics

The Antioch General Plan EIR determined that as the City of Antioch continues to expand, future development could alter landforms, scenic vantage points, and the overall character of the City. The proposed project would contribute to the cumulative change in visual character within the City of Antioch and City of Brentwood. However, in terms of the change to the visual character of the project area, development on the project site would be typical of what is anticipated to occur around the project site. Thus, development in the City, in addition to the development on the project site, would contribute to a change in the visual character of the area.

The General Plan EIR addressed build-out of the plan area, which included the project site, and concluded that, with implementation of policies included in the General Plan, converting vacant land to urban use would not create a significant impact. While the General Plan EIR contemplated business park uses on the majority of the project site, development with residential uses would not change EIR's conclusion. Both uses are considered to be urbanization of vacant land, with similar visual effects. Therefore, the conversion of the project site, in addition to other

lands in the project area, to an urban residential setting would be considered ***less than significant***.

Air Quality and Greenhouse Gas Emissions

The Air Quality and Greenhouse Gas (GHG) Emissions chapter of the EIR addresses cumulative impacts associated with regional air quality and greenhouse gas emissions separately. Each of the discussions included in the EIR are summarized below.

Cumulative Criteria Air Pollutants

A project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development projects. By its very nature, air pollution is largely a cumulative impact. The long-term emissions associated with operation of the proposed project in conjunction with other existing or planned development in the area, would incrementally contribute to the region's air quality. The proposed project's contribution to cumulative emissions of criteria air pollutants were calculated using CalEEMod, and were estimated to be below the applicable thresholds of significance. Therefore, the proposed project's incremental contribution to cumulative air quality impacts would be considered *less than significant*.

Greenhouse Gas Emissions

Global climate change is, by nature, a cumulative impact. A single project could not generate enough GHG emissions to contribute noticeably to a change in the global average temperature. However, the combination of GHG emissions from a project in combination with other past, present, and future projects contribute substantially to the world-wide phenomenon of global climate change and the associated environmental impacts. Implementation of the proposed project would cumulatively 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, CH_4 and N_2O. Sources of GHG emissions include area sources, mobile sources or vehicles, utilities, water usage, wastewater generation, and the generation of solid waste.

Construction GHG emissions are a one-time release and are not typically expected to generate a significant contribution to global climate change. The proposed project's construction GHG emissions have been calculated for the proposed project. CalEEMod was utilized in calculating the construction-related GHG emissions. The project's total unmitigated annual GHG emissions, including construction-related emissions, were estimated to be approximately 4.47 metric tons of CO_2 equivalents ($MTCO_2e$) per service population per year, which is below the threshold of significance for GHG emissions. Therefore, because the project's unmitigated annual GHG emissions would be below the 4.6 $MTCO_2e$ per service population per year threshold utilized by the City, impacts related to GHG emissions and global climate change as a result of implementation of the proposed project would be considered *less than significant*.

Conclusion

In conclusion, based on the analysis above, the proposed project's contribution to the increase in cumulative-criteria air pollutants and greenhouse gas emissions would be considered ***less than significant***.

Biological Resources

The City of Antioch, like other cities and communities in the region, is experiencing urban growth. The Antioch General Plan EIR concluded that impacts to species identified as a candidate, sensitive or special status species, as well as riparian, wetland, or other natural communities would be less-than-significant after implementation of General Plan Policies 10.4.2 and 10.3.2. The proposed project site was included as part of the Antioch General Plan Area. Although the proposed project's is compliant with the Antioch General Plan EIR, the cumulative biological impact related to the loss of biological resources in the City of Antioch and the effects of urbanization in the region would be *potentially significant* because sensitive species and habitats have the potential to occur on the project site. However with the implementation of mitigation measures, presented in the Biological Resources chapter of this EIR, impacts related to the cumulative loss of biological resources in the City of Antioch and the effects of ongoing urbanization in the region would be considered ***less than significant***.

Cultural Resources

Prehistoric and historic cultural resources are unique and non-renewable resources. Development activities continue to damage and destroy both prehistoric and historic sites and features, in many cases, before the information inherent in the site could be reviewed, recorded, and interpreted. As presented in the Cultural Resources Chapter of this EIR, the potential exists for unknown subsurface prehistoric, historic, archaeological, and paleontological cultural resources to be unearthed during site excavation. The proposed project, along with other development in the City of Antioch and surrounding region, could damage or destroy cultural resources particular to the project area. It is possible that some of the projects listed in section 5.3, above, and other regional development would adversely affect cultural resources. Thought the implementation of cumulative projects could collectively impact cultural resources in the geographic area, the proposed project's incremental impact when added to other past, present, and reasonably foreseeable future actions would be relatively minor because no known eligible resources would be impacted by the proposed project. Under CEQA, to constitute a significant cumulative impact there must both be a significant impact of the project combined with the impacts of other past, present and reasonably foreseeable project, and the contribution of the project to that combined impact must be cumulatively considerable. Here, because there are no known cultural resources located on the project site, the project's contribution to a combined effect on cultural resources would be ***less than cumulatively considerable.***

Geology, Soils, and Mineral Resources

The continuing buildout of developments in the City of Antioch and surrounding areas would be expected to increase the need for surface grading and excavation, and, therefore, increase the

potential for impacts related to soil erosion, unforeseen hazards, and exposure of people and property to earthquakes. Development of the proposed project would increase the number of structures that could be subject to the damaging effects of expansive soils. In addition, site preparation would also result in temporary and permanent topographic changes that could affect erosion rates or patterns. However, potentially adverse environmental effects associated with geologic or soils constraints, topographic alteration, and erosion, are usually site-specific and generally would not combine with similar effects that could occur with other projects in Antioch and the surrounding region. Furthermore, all projects would be required to comply with the California Building Code, the City of Antioch's General Plan, and other applicable regulations. Consequently, the proposed project would generally not be affected by, nor would it affect, other development approved by the City of Antioch. Therefore, the project's contribution to cumulative geology, soils, and mineral resources impacts would be considered ***less than significant***.

Hazards and Hazardous Materials

Impacts associated with hazardous materials are site-specific and generally do not affect, or are not affected by, cumulative development. The Hazards and Hazardous Materials chapter of this EIR addresses the cumulative increase in the number of people who could be exposed to potential hazards associated with potentially contaminated soil and groundwater as well as an increase in the transport, storage, and use of hazardous materials from development of the proposed project in combination with other reasonable foreseeable projects in the region.

Because the proposed project consists of residential development, industrial processes would not occur and hazardous materials would not be utilized. In addition, impacts resulting from hazardous materials were found to be less than significant or less than significant with the implementation of the recommended mitigation measures. Furthermore, any future proposed development projects would be subject to the same environmental review, as well as the same federal, State, and local hazardous materials management requirements as the proposed project, which would minimize potential risks associated with increased hazardous materials use in the community, including potential effects, if any, on the proposed project. Therefore, the proposed project would have a ***less than significant*** contribution to cumulative impacts associated with hazardous materials and hazards.

Hydrology and Water Quality

While cumulative development within the City of Antioch would result in additional stormwater runoff and entry of pollutants into receiving waters via construction and operation of future projects, each project is required to comply with the City's regulatory stormwater documents, standards, and requirements. Compliance with such would ensure that each project provides adequate storage capacity for the additional stormwater runoff generated, as well as incorporates sufficient Best Management Practices (BMPs) to successfully remove pollutants from site runoff during the construction and operational phases. The proposed project would not result in any significant impacts to hydrology or water quality. As a result, the proposed project's incremental contribution to cumulative hydrology and water quality impacts would be ***less than significant***.

Land Use and Planning / Agricultural Resources

The Land Use and Planning / Agricultural Resources chapter of the EIR addresses cumulative impacts associated with land use and planning, agricultural resources, and population and housing separately. Each of the cumulative discussions included in the EIR are summarized below.

Land Use and Planning

The proposed project, along with reasonably foreseeable projects within the City of Antioch, would change the intensity of land uses within the geographic area that would be affected by the proposed project. The increased development associated with these projects would result in environmental impacts, such as traffic, air, and noise, which are analyzed in other technical chapters of this EIR.

The 141.6-acre project site is designated Business Park, Public/Quasi Public, and Open Space/Senior Housing and is zoned Study Zone. Therefore, the proposed project includes a General Plan Amendment and rezone to Medium Low Density Residential and Open Space, and Planned Development (PD) respectively. The proposed Vesting Tentative Map would subdivide the proposed project site up to 650 single-family residential units on 127.5 acres; 31.6 acres of parks and landscaped areas, and would include all infrastructure required to support the proposed development. Pending the approval of the General Plan Amendment, the Master Development, and the Rezone, the project site would be designated Medium Low Density Residential and Open Space, and zoned PD. As a result, the final authority for determination of consistency with the Antioch General Plan and zoning rests with the Antioch City Council. Given the land use controls, Antioch General Plan objectives and policies, and development standards presently in use within Antioch and proposed by the project's PD standards, the Development Agreement, as well as the future requirement for design review, the project's contribution to cumulative land use impacts would be minimized to a level that is considered ***less than significant.***

Agricultural Resources

As discussed in Impact 4.8-5 of Chapter 4.8, the project site is not considered Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. In addition, the proposed project site is not zoned or designated for agricultural use. Therefore, the proposed project would not contribute to the cumulative loss of Important Farmland in the region. In addition, the Antioch General Plan EIR analyzed impacts to agricultural resources associated with the buildout of the entire General Plan. Because the proposed project would not result in the conversion of agricultural land to non-agricultural uses beyond that anticipated within the Antioch General Plan EIR, the project's incremental contribution to the cumulative loss of agricultural land would be considered ***less than significant***.

Population and Housing

The Antioch General Plan enables residential growth, and identifies the necessary infrastructure improvements, including roads, utilities, and government services that would support future

growth. Specifically, the Antioch General Plan planned for open space, residential, business park, commercial, and mixed-use development at the project site. The new residences provided by the proposed project would fall within the Association of Bay Area Governments' (ABAG's) growth estimates for the City of Antioch.

The direct and indirect impacts of population and housing growth on the project site are considered throughout this EIR and include potential impacts to traffic, air quality, noise, the provision of public services and utilities, and other resource areas. To the extent that the projected population would result in significant adverse effects to such resources, the impacts have been identified and considered within relevant sections of this EIR.

Because the population from the proposed project has been anticipated by the various utilities and public service providers and other agencies that rely on ABAG's population projections for anticipating future impacts on various services. As a result, the increase in housing and population facilitated by the proposed project would not be considered to result in a significant incremental contribution to the cumulative impact on population, housing, or employment growth, and the proposed project's cumulative impacts related to population and housing would be considered ***less than significant***.

Noise

The cumulative context for noise impacts associated with the proposed project would consist of the existing and future noise sources that could affect the project or surrounding uses. Noise generated by construction would not add to the permanent noise environment or be considered as part of the cumulative context. Cumulative noise impacts would occur primarily as a result of increased traffic on local roadways due to the proposed project and on-site activities resulting from operation of the proposed project.

Cumulative noise levels at the closest sensitive receptors without the proposed project would exceed City standards at many locations. Because the increase in noise levels associated with implementation of the proposed project would not cause an audible (3.0 dBA) increase in noise in areas where General Plan noise objectives are already exceeded as the result of existing development, the total noise increase associated with the proposed project would be considered a less-than-significant incremental increase to the future noise environment. In addition, at the locations not already exceeding noise standards, the addition of proposed project noise would not increase noise to levels that would exceed City standards. Because noise attenuation measures would be required for the proposed sensitive residential receptors along Hillcrest Avenue and Sand Creek Road, the cumulative noise impact would be considered **potentially significant**. However, with the implementation of mitigation measures provided in detail in the Noise chapter of this EIR, impacts related to cumulative noise would be considered to be ***less than significant.***

Public Services, Recreation, and Utilities

The Public Services, Recreation, and Utilities chapter of the EIR addresses cumulative impacts associated with water, wastewater, solid waste, and law enforcement, fire protection, schools, parks and recreational facilities separately. Each of the discussions included in the EIR are summarized below.

Water

According to the Water Supply Assessment (WSA) prepared for the project, the project will not contribute to a significant cumulative impact related to water supply. As shown in the WSA, City-wide supplies are projected to be sufficient to meet future City-wide demands, including future demands from the project, during normal years, single dry years, the first year of a multi-year drought, and the second year of a multi-year drought. Although a deficit is projected for the third year of a multi-year drought,[1] the City has a Water Shortage Contingency Plan in place that is designed to reduce cumulative City-wide demands when needed, so that the cumulative demands will not outpace the City's supplies. Therefore, City water supplies are sufficient to meet the City's existing and projected future water demands, including those future demands associated with the proposed project, to the year 2035.

Wastewater

Delta Diablo has reported that recommendations for solutions to the projected future deficiency in the Delta Diablo Wastewater Treatment Plant (WWTP) influent sewer would be developed as part of the WWTP Headworks Improvements Project predesign. The proposed land use changes would not significantly impact any potential projects that might be required to address this issue. The project's incremental increase in wastewater generation has been anticipated and would not represent a cumulatively considerable increase in the demand for wastewater treatment services.

Solid Waste

The Keller Canyon Landfill is currently at 16 percent capacity and is expected to have adequate capacity to serve the regional waste disposal needs. In addition, similar to water supply demands, as standards and regulations regarding solid waste reduction and recycling programs become more stringent, the overall demand for solid waste services would likely reduce compared to baseline conditions.

Law Enforcement, Fire Protection, Schools, Parks and Recreation Facilities

The proposed project would comply with all applicable City goals and policies, including payment of development impacts fees to support adequate provisions for fire facilities, staffing, and equipment, developer fees per SB 50 for schools, dedication of parks and recreational lands, and with funding from Measure O, as well as the special tax or other financing mechanism to fund police services as will be outlined in the Development Agreement. Similar to the proposed

[1] See Table 7-1 of the WSA, which projects a 9 percent deficit under multi-year drought conditions in 2035.

project, other future development projects would be required by the City to pay their fair-share fees toward the provision of adequate public services and facilities, including towards the necessary upgrades and expansions of facilities and equipment. Thus, the proposed project's increase in demand for public services and facilities would not be cumulatively considerable.

Conclusion

The proposed project's individual incremental contribution to the increase in demand for public services and facilities would not be cumulatively considerable, and cumulative impacts would be considered ***less than significant***.

Transportation and Circulation

The Transportation and Circulation chapter of this EIR summarizes the level of service (LOS) results for Cumulative conditions and Cumulative Plus Project conditions for each of the project study intersections. The proposed project trips were added to the cumulative traffic volumes for the Cumulative Plus Project conditions. One intersection, Sand Creek Road at SR 4 East Bound Ramps, is projected to operate deficiently in the cumulative condition prior to the addition of project traffic. The addition, project traffic would increase delay to the Sand Creek Road at State Route 4 East Bound Ramps intersection by approximately 16 seconds in the PM peak hour. All other study intersections are projected to operate at acceptable service levels. Therefore, a potentially significant cumulative impact would result to Sand Creek Road/SR 4 East Bound Ramps intersection under the Cumulative Plus Project conditions. Furthermore, the Cumulative freeway operations were evaluated based on the estimates of cumulative traffic plus project-generated traffic. In the Cumulative condition with planned improvements along the SR 4 corridor, travel speeds are expected to be generally free-flow through the study area. Although the project would further increase traffic on SR 4 in the Cumulative condition, planned improvements would allow the freeway to operate with acceptable levels of congestion during peak hours. Nevertheless, due to the potentially significant cumulative impact to the Sand Creek Road/SR 4 East Bound Ramps intersection under the Cumulative Plus Project condition, a **potentially significant** impact could result. However, implementation of mitigation measures would reduce the above impacts to ***less than significant.***

5.4 ENERGY CONSERVATION

Appendix F of the CEQA Guidelines requires that EIRs include a discussion of the potential energy impacts of the proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. The goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include:

(1) Decreasing overall per capita energy consumption;
(2) Decreasing reliance on fossil fuels such as coal, natural gas and oil; and
(3) Increasing reliance on renewable energy sources.

California Green Building Standards Code

The 2013 California Green Building Standards Code, otherwise known as the CALGreen Code (CCR Title 24, Part 11), became effective January 1, 2014. The energy provisions of the CALGreen Code became effective July 1, 2014. The purpose of the CALGreen Code is to improve public health, safety, and 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. The provisions of the code apply to the planning, design, operation, construction, use, and occupancy of every newly constructed building or structure throughout California.

The proposed project would introduce new residences to the area, which would result in an increase in energy usage and associated demand for energy within the City. However, the project site is adjacent to existing development, where existing energy supplies occur and are available. Furthermore, the proposed project is required to comply with the mandated standards of the CALGreen Code, including compliance with the California Building Energy Efficiency Standards Code. Measures included in the Project to reduce energy use include energy efficient lighting and windows, increased insulation, pre-plumbing/wiring for rooftop solar and designating a "solar zone" on the roof.

The proposed project would also be in proximity to transit services, potential workplaces, goods and services, and recreation activities. Accordingly, the proposed project would promote walking and bicycling, which would provide for a potential reduction in vehicle trips associated with buildout of the site. Overall, the proposed project would not result in a wasteful, inefficient, or unnecessary usage of energy. Therefore, impacts related to energy conservation would be considered less than significant.

5.5 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

The State CEQA Guidelines mandate that an EIR address any significant irreversible environmental changes that would result if the proposed project were implemented (CEQA Guidelines, Section 15126.2[c]). An impact would fall into this category if any of the following would occur:

- The project would involve a large commitment of nonrenewable resources;
- The primary and secondary impacts of a project would generally commit future generations to similar uses (e.g., a highway provides access to a previously remote area);
- The project involves uses in which irreversible damage could result from any potential environmental accidents associated with the project; or
- The phasing of the proposed consumption of resources is not justified (e.g., the project involves a wasteful use of energy).

The proposed project would likely result in, or contribute to, the following irreversible environmental changes:

- Conversion of currently undeveloped land to urban land uses;
- Placement and/or extension of roadways in areas providing access to the proposed project and connecting to adjacent developments;
- Irreversible consumption of goods and services associated with the future population; and
- Irreversible consumption of energy and natural resources associated with the future population.

5.6 Significant and Unavoidable Impacts

According to CEQA Guidelines, an EIR must include a description of those impacts identified as significant and unavoidable should the proposed action be implemented (CEQA Guidelines §15126.2[b]). Such impacts would be considered unavoidable when the determination is made that either mitigation is not feasible or only partial mitigation is feasible such that the impact is not reduced to a level that is less-than-significant. This section identifies significant impacts that could not be eliminated or reduced to a less-than-significant level by mitigations imposed by the City. The final determination of the significance of impacts and the feasibility of mitigation measures would be made by the City as part of the City's certification action.

Significant and unavoidable impacts from the development the Vineyards at Sand Creek Project would not occur. All impacts that are potentially significant have been mitigated to a less-than-significant level.

6. ALTERNATIVES ANALYSIS

6 ALTERNATIVES ANALYSIS

6.1 INTRODUCTION

The primary intent of the Alternatives Analysis in an EIR, as stated in Section 15126.6(a) of the CEQA Guidelines, is to "[…] describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." Furthermore, Section 15126.6(f) states, "The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice."

The CEQA Guidelines provide the following guidance for discussing alternatives to a proposed project:

- An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives (CEQA Guidelines Section 15126.6[a]).
- Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly (CEQA Guidelines Section15126.6[b]).
- The range of potential alternatives to the proposed project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination […] Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts (CEQA Guidelines Section15126.6[c]).
- The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison (CEQA Guidelines Section 15126.6[d]).

- The specific alternative of "no project" shall also be evaluated along with its impact. The purpose of describing and analyzing a no project alternative is to allow decisionmakers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. The no project alternative analysis is not the baseline for determining whether the proposed project's environmental impacts may be significant, unless it is identical to the existing environmental setting analysis which does establish that baseline (CEQA Guidelines Section 15126.6[e][1]).
- If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives (CEQA Guidelines Section15126.6[e][2]).

In addition, Section 15126.6(d) of the CEQA Guidelines states, "If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed."

6.2 PURPOSE OF ALTERNATIVES

The project alternatives need to feasibly attain most of the basic objectives of the proposed project, while avoiding or substantially lessening any of the significant effects of the project.

The following project objectives have been developed for the propose project:

- To implement the City's General Plan and Sand Creek Focus Area of the General Plan goals by creating an economically viable project that is capable of providing various infrastructure improvements that are able to serve the project and facilitate service to future planned development, including trunk line infrastructure that is necessary for the ultimate development of the Sand Creek Focus Area of the General Plan (and without which future planned development in the area would not be financially feasible), and public roadway improvements.
- To help the City of Antioch provide its fair share of housing, and help alleviate a regional housing shortage, by providing a mix of housing types and sizes, some moderately affordable, and which can meet the needs of a variety of different and growing household sizes.
- To provide Antioch's first residential gated community, and make it compatible with the surrounding residential uses, yet a visually identifiable community that is at a scale and quality similar to gated residential developments in the greater East Bay.
- To provide onsite amenities and recreational opportunities, such as a pool club and a private sports park, and provide a Sand Creek trail connection.
- To provide housing near major transportation and regional trails connections, with increased land use intensities near regional transportation connections.
- To create a community that is family friendly or that could accommodate senior residents.
- To implement the County's Growth Management Program by providing for urban development within the Urban Limit Line.

- To contribute to the City of Antioch's economic and social viability by creating a community that attracts investment and positive attention.

Potentially significant environmental impacts of the proposed project, which would be reduced to less-than-significant levels with implementation of the mitigation measures set forth in each of the associated chapters of this EIR, include the following:

- ***Aesthetics.*** Potentially significant impacts are identified for light and glare.

- ***Air Quality and Greenhouse Gas Emissions.*** Potentially significant impacts are identified for the generation of short-term construction-related criteria air pollutant emissions.

- ***Biological Resources.*** Potentially significant impacts are identified for the California red-legged frog, western pond turtle, western burrowing owl, Swainson's hawk, nesting raptors, nesting special-status and common bird species, San Joaquin kit fox, Waters of the U.S. and/or State, Section 1602 jurisdictional areas, trees protected by the City of Antioch Tree Preservation and Regulation Ordinance, and cumulative loss of biological resources in the City of Antioch.

- ***Cultural Resources.*** Potentially significant impacts are identified for archaeological resources and human remains, and paleontological resources on the project site.

- ***Geology, Soils, and Mineral Resources.*** Potentially significant impacts are identified for risks to people or structures associated with seismic activity, expansive soils, and risks associated with substantial erosion or loss of topsoil.

- ***Hazards and Hazardous Materials.*** Potentially significant impacts are identified for the upset or accidental release of hazardous materials into the environment.

- ***Noise.*** Potentially significant impacts are identified for a substantial temporary or periodic increase in ambient noise levels in the project vicinity, transportation-related noise levels at new sensitive receptors, and cumulative impacts on noise-sensitive receptors.

- ***Public Services, Recreation, and Utilities.*** Potentially significant impacts are identified for adequate school capacity at the Brentwood Union and Liberty Union School Districts and parks.

- ***Transportation and Circulation.*** Potentially significant impacts are identified for construction-related traffic, site access and circulation, and study roadway intersections under cumulative plus project conditions.

6.3 SELECTION OF ALTERNATIVES

The requirement that an EIR evaluate alternatives to the proposed project or alternatives to the location of the proposed project is a broad one; the primary intent of the alternatives analysis is to disclose other ways that the objectives of the project could be attained while reducing the magnitude of, or avoiding, the environmental impacts of the proposed project. Alternatives that are included and evaluated in the EIR must be feasible alternatives. However, the CEQA Guidelines require the EIR to "set forth only those alternatives necessary to permit a reasoned choice." The CEQA Guidelines provide a definition for "a range of reasonable alternatives" and thus limit the number and type of alternatives that may need to be evaluated in a given EIR. According to the *CEQA Guidelines* Section 15126.6(f):

> The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determined could feasibly attain most of the basic objectives of the project.

First and foremost, alternatives in an EIR must be feasible. In the context of CEQA Guidelines Section 21061.1, "feasible" is defined as:

> ...capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors.

Finally, an EIR is not required to analyze alternatives when the effects of the alternative "cannot be reasonably ascertained and whose implementation is remote and speculative."

Alternatives Considered But Dismissed From Further Analysis

Consistent with CEQA, primary consideration was given to alternatives that could reduce significant impacts, while still meeting the basic project objective. Any alternative that would have impacts identical to or more severe than the proposed project, and/or that would not meet any or most of the project objectives were dismissed from further consideration. The alternatives considered but dismissed from further analysis in this EIR are discussed below.

One alternative, the Off-Site Alternative, was considered but dismissed. The major characteristics of the Off-Site Alternative are summarized below.

Off-Site Alternative

Section 15126.6(f)(2)(B) of the CEQA Guidelines states, "If the lead agency concludes that no feasible alternative locations exist, it must disclose the reasons for this conclusion, and should include the reason in the EIR." A feasible location for the proposed project that would result in substantially reduced impacts does not exist.

The CEQA Guidelines Section 15126.6(b) requires that only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR. The Off-Site Alternative would involve the construction of the proposed project on an alternative location. The Off-Site Alternative would locate the proposed project on other lands located within the vicinity of the proposed project site. However, other sites in the vicinity would likely have equal or greater impacts compared to the proposed project site. For example, the proposed project site is primarily covered with non-native vegetation and historic aerial photos show the property has been farmed and disked since the 1930's. A comparable off-site property could contain vegetation or other habitat types, thereby resulting in potentially greater impacts to biological resources. In addition, much of the vacant land in the vicinity of the project site is not available to develop due to existing development applications and/or planned developments. For example, the applicant for The Ranch residential project, located to the west of the proposed project site, and the applicant for the Aviano Farms project, located to the west of the proposed project site, recently submitted applications for development of the parcels and are currently undergoing the environmental review process.

Furthermore, the CEQA Guidelines state that, by definition, an alternative should avoid or substantially lessen one or more of the environmental effects of the project. Alternative locations within the City would generally contain characteristics similar to the proposed project site. Development of the project on another similar site would result in an equal area being graded and, therefore, similar physical environmental impacts would occur related to land disturbance activities. In addition, the development of the same number of residential units would result in traffic, air quality, and noise impacts that would likely be very similar, or even potentially worse than the proposed project, depending on site accessibility. Therefore, development of the project at an alternative location in the City of Antioch would be expected to result in the same impacts, or worse, when compared to the proposed project. As a result, an environmentally feasible off-site location that would meet the requirements of CEQA, as well as meet the basic objectives of the project, does not exist.

Alternatives Considered in this EIR

The following alternatives are considered and evaluated for the proposed project:

- No Project (No Build) Alternative;
- Buildout Pursuant to Existing General Plan Alternative; and
- Executive Residential Alternative.

CEQA requires the evaluation of the comparative impacts of the "No Project" alternative (CEQA Guidelines Section 15126.6[e]). Analysis of the No Project Alternative "… shall discuss […] existing conditions […] as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services." (*Id.*, subd. [e][2]) "If the project is other than a land use or regulatory plan, for example a development project on identifiable property, the 'no project' alternative is the circumstance under which the project does not proceed. Here the discussion would compare the environmental effects of the property remaining in the property's existing state versus environmental effects that would occur if the project were approved. If disapproval

of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this 'no project' consequence should be discussed. In certain instances, the no project alternative means 'no build,' wherein the existing environmental setting is maintained. However, where failure to proceed with the project would not result in preservation of existing environmental conditions, the analysis should identify the practical result of the project's non-approval and not create and analyze a set of artificial assumptions that would be required to preserve the existing physical environment." (*Id.*, subd. [e][3][B]).

Per the requirements of the CEQA Guidelines, the City has decided to evaluate a No Project (No Build) Alternative.

In addition, the City has decided to evaluate a Buildout Pursuant to Existing General Plan Alternative, which includes the development of 16 two-story office buildings on 131 acres of the 141.6-acre project site for a total of 2,600,000 square feet (sf). The Buildout Pursuant to Existing General Plan Alternative would eliminate the single-family housing units and would include a 2.77-acre park in the center of the site. The buildings and streets would be laid out in a grid-style with predominantly east-west building orientations. Building sizes would average 150,000 sf and would range from 60,000 sf to 280,000 sf. Under the Buildout Pursuant to Existing General Plan Alternative, the centrally-located park parcel would be increased from 2.1 acres to 2.77 acres and the water quality detention basin would remain unchanged. Overall, the Buildout Pursuant to Existing General Plan Alternative would eliminate the residential units and introduce business park uses to the site.

Furthermore, the City has decided to evaluate an Executive Residential Alternative. The Executive Residential Alternative would reduce the amount of single-family units from 650 to 232 units on approximately 131 acres resulting in a density of 1.77 du/ac. In addition, the lot sizes would increase from 4,200 to 5,160 sf to an average of 12,000 sf. The Executive Residential Alternative would arrange the single-family units and roadways in a similar fashion as the proposed project. In addition, a 4.0-acre park would be located north of a water quality detention basin and a 2.77-acre park would be centrally-located. Overall, the Executive Residential Alternative would reduce the total number of residential units from 650 under the proposed project to 232 units and increase the lot sizes to 12,000 sf.

The major characteristics of each of the alternatives are summarized below.

No Project (No Build) Alternative

The No Project (No Build) Alternative is defined in this section as the continuation of the existing conditions of the project site, which is currently disturbed, vacant, agricultural land. The No Project (No Build) Alternative would not meet any of the project objectives. Because development of the site would not occur, land disturbance and any associated physical environmental impacts would not occur as a result of the No Project (No Build) Alternative. For example, transportation, traffic, and circulation in the project vicinity would not be modified under the No Project (No Build) Alternative; thus, all associated impacts such as increased vehicle traffic on area roadways, increase in mobile air pollutant emissions, and traffic-related noise increases would not occur. Therefore, impacts related to air quality and climate change,

noise, and transportation, traffic, and circulation would be fewer than anticipated for the proposed project.

Because land disturbance would not occur under the No Project (No Build) Alternative, impacts to any potential biological resources on-site or in the project vicinity would not occur. Similarly, a conversion of agricultural or forest land to non-agricultural or non-forest uses would not occur. For the same reason, a potential to affect any cultural resources on-site or in the project vicinity would not occur. Thus, impacts related to biological and cultural resources would not occur.

Because the site would not introduce any new structures or buildings on the site under the No Project (No Build) Alternative, modifications to the existing visual character or quality of the site or surroundings, creation of any new sources of light or glare, changes to views of or from scenic vistas, or changes to scenic resources would not occur. Similarly, impacts related to structures being affected by geology, soils, and seismicity would not occur, and on-site construction personnel or future residents would not be exposed to any potential hazardous materials on-site. Because known mineral resources do not exist in the project area, impacts related to such would not occur.

The No Project (No Build) Alternative would not alter the existing drainage pattern of the site or surrounding area and would not create or contribute an increase in runoff water that would exceed existing or planned stormwater drainage system capacity or violate water quality standards. Groundwater recharge would not be affected by the No Project (No Build) Alternative. Placement of housing or structures within a floodplain and any associated risks would not occur with the No Project (No Build) Alternative. Therefore, impacts related to hydrology and water quality would be fewer than that of the proposed project.

The No Project (No Build) Alternative would not involve the creation of housing and would not directly increase population or employment in the area. Accordingly, modifications to the population and/or housing in the area would not occur, and an associated increase in demand for public services and utilities would not occur. It should be noted, however, that the No Project (No Build) Alternative could result in potentially greater impacts than the proposed project related to land use and planning associated with compatibility issues and consistency with the Antioch General Plan, as the No Project (No Build) Alternative would result in the ongoing vacancy on a site that is currently designated and zoned for urban uses. Under the No Project (No Build) Alternative, the site would not buildout by the City, which could allow the site to continue to be used for agricultural purposes. However, the site is immediately adjacent to currently developed areas with existing residential development and proposed future residential development. Thus, if the site continues to be vacant, compatibility with the surrounding land uses could potentially become an issue as the City of Antioch continues to grow.

Because implementation of the No Project (No Build) Alternative would result in the site remaining under current conditions, physical environmental impacts would not occur. Therefore, implementation of the No Project (No Build) Alternative would result in fewer overall impacts compared to that of the proposed project.

The following areas would result in no impact if the No Project (No Build) Alternative were selected:

- Aesthetics
- Air Quality and GHG Emissions;
- Biological Resources;
- Geology, Soils, and Mineral Resources;
- Hazards and Hazardous Materials;
- Hydrology and Water Quality;
- Noise;
- Transportation, and Circulation; and
- Public Services, Recreation, and Utilities.

Buildout Pursuant to Existing General Plan Alternative

The Buildout Pursuant to Existing General Plan Alternative would achieve few of the proposed project's objectives. The Buildout Pursuant to Existing General Plan Alternative would include the development of 16 two-story office buildings on 131 acres of the 141.6-acre project site for a total of 2,600,000 sf. The Buildout Pursuant to Existing General Plan Alternative would eliminate the single-family housing units and would include a 2.77-acre park in the center of the site. The buildings and streets would be laid out in a grid-style with predominantly east-west building orientations. Building sizes would average 150,000 sf and would range from 60,000 sf to 280,000 sf. Under the Buildout Pursuant to Existing General Plan Alternative, the centrally-located park parcel would be increased from 2.1 acres to 2.77 acres and the water quality detention basin would remain unchanged. Overall, the Buildout Pursuant to Existing General Plan Alternative would eliminate the residential units and introduce business park uses to the site.

Aesthetics

Development of the Buildout Pursuant to Existing General Plan Alternative would result in development of a business park on the proposed project site. Because the site is not visible from a State scenic highway and does not contain scenic resources, the Buildout Pursuant to Existing General Plan Alternative would have no impact, similar to the proposed project, related to scenic vistas, and scenic resources, including but not limited to trees, rocks, and outcroppings within a state scenic highway. In addition, less-than-significant cumulative impacts would still occur under the Buildout Pursuant to Existing General Plan Alternative similar to the proposed project. Because the Buildout Pursuant to Existing General Plan Alternative would result in the conversion of the project site to urban development, the Buildout Pursuant to Existing General Plan Alternative would alter the existing visual character and quality of the site and the site's surroundings, and would introduce new sources of light and glare to the area. However, any development on the project site, be it the Buildout Pursuant to Existing General Plan Alternative or the proposed project, would be subject to the Citywide Design Guidelines requirements, such as design consistency, building materials, and lighting requirements. It should be noted that the Buildout Pursuant to Existing General Plan Alternative would be inconsistent with the adjacent

existing and planned residential developments to the west, north, and east. Nevertheless, the level of potential impacts associated with aesthetics, including potential cumulative impacts, would be expected to be equal under the Buildout Pursuant to Existing General Plan Alternative as compared to the proposed project.

Air Quality and GHG Emissions

The Buildout Pursuant to Existing General Plan Alternative would eliminate the residential portion of the proposed project and develop a total of 2,600,000 sf of business park uses. Buildout of the site per the Buildout Pursuant to Existing General Plan Alternative would result in a similar development footprint as the proposed project. Because the Buildout Pursuant to Existing General Plan Alternative would involve a similar overall area of disturbance as the proposed project, construction-related emissions would likely be similar to what is expected for the proposed project. It should be noted that Mitigation Measure 4.2-1 of this EIR would reduce the construction-related emissions resulting from the Buildout Pursuant to Existing General Plan Alternative.

Because the Buildout Pursuant to Existing General Plan Alternative would involve more square footage and would generate employees in the area, emissions associated with vehicle trips, as well as area and energy sources, would be greater than that of the proposed project. The California Emissions Estimator Model (CalEEMod) version 2013.2.2 software was utilized to estimate the Buildout Pursuant to Existing General Plan Alternative's operational emissions. The CalEEMod results are presented in Table 6-1. As shown in the table, the Buildout Pursuant to Existing General Plan Alternative would result in greater overall operational emissions, including daily and annual criteria air pollutant emissions. The operational emissions would exceed the applicable thresholds of significance at project-level for ROG, NO_x, and PM_{10}, as well as cumulatively for ROG, NO_x, and PM_{10}. Thus, mitigation measures would be required. The proposed project did not require mitigation for operational emissions.

The total GHG emissions were estimated to be higher than that of the proposed project, and the total annual GHG emissions per service population would be above the applicable threshold of significance. Therefore, impacts related to GHG emissions would be greater under the Buildout Pursuant to Existing General Plan Alternative than the proposed project.

Because the Buildout Pursuant to Existing General Plan Alternative would result in greater trips than the proposed project, the alternative would result in greater traffic on area roadways and, thus, an increased contribution to localized CO concentrations at surrounding intersections. As the Buildout Pursuant to Existing General Plan Alternative would consist of buildout on the same site in the same location as the proposed project with the same land uses, the effects of the project, as well as on the project from nearby sources of TACs, would be similar to that of the proposed project.

Overall, the Buildout Pursuant to Existing General Plan Alternative would result in greater impacts than the proposed project related to air quality and GHG emissions.

Table 6-1
Unmitigated Buildout Pursuant to Existing General Plan Alternative Emissions

Pollutant	Unmitigated Buildout Pursuant to Existing General Plan Alternative Emissions	Unmitigated Proposed Project Emissions	BAAQMD Thresholds of Significance (lbs/day)
OPERATIONAL (lbs/day)			
ROG	134.64	45.70	54
NO_X	149.50	30.99	54
PM_{10}	160.84	30.95	82
$PM_{2.5}$	45.19	9.77	54
CUMULATIVE (tons/yr)			
ROG	20.36	7.73	10
NO_X	19.90	5.36	10
PM_{10}	21.10	5.25	15
$PM_{2.5}$	5.98	1.53	10
GHG ($MTCO_2e$/yr)			
Operational GHG Emissions	39,239.90	7,614.68	-
Total Annual GHG Emissions[1]	40,027.76	8,402.54	-
Service Population[2,3]	1,482	1,879	-
Total Annual GHG Emissions Per Service Population	**27.01**	**4.47**	**4.6**

Notes:
[1] Includes operational emissions plus construction emissions. For analysis purposes, the amortized construction-related GHG emissions were assumed to be similar to the proposed project under the Alternative (i.e., 787.86 $MTCO_2e$/yr).
[2] Based on the number of anticipated employees and total square footage for Business Park/Industrial uses at General Plan Buildout (per Table 3.D of the City's General Plan EIR), an average employee per square foot was calculated. For this analysis, the average employee per square foot for a Business Park/Industrial use was assumed to be approximately 2.85 employees per 5,000 square feet. For the Buildout Pursuant to Existing General Plan Alternative, the service population would be approximately 1,482.
[3] Service population for proposed project calculated to be 1,879 based on 2.93 persons per household.

Source: CalEEMod, March 2015.

Biological Resources

The Buildout Pursuant to Existing General Plan Alternative would convert a similar area to commercial uses as compared to the proposed project. As such, the same potential exists for effects on existing habitat, interference with native or migratory wildlife species or corridors, confliction with policies or ordinance protecting biological resources, and confliction with provisions of an adopted habitat conservation plan. Therefore, impacts related to biological resources would be equal under the Buildout Pursuant to Existing General Plan Alternative to the proposed project.

Cultural Resources

Because the Buildout Pursuant to Existing General Plan Alternative would be developed on the same site as the proposed project, the same potential exists for damage to or destruction of previously unknown prehistoric and/or historic cultural resources or human remains during ground disturbing activities. The same mitigation measures would be required under the Buildout Pursuant to Existing General Plan Alternative as for the proposed project in order to reduce potential impacts to less-than-significant levels. Therefore, the overall potential impacts related to cultural resources would be equal under the Buildout Pursuant to Existing General Plan Alternative as compared to the proposed project.

Geology, Soils, and Mineral Resources

Development of the Buildout Pursuant to Existing General Plan Alternative would result in similar site disturbance as the proposed project, but would consist of buildout of 650 fewer residential units and would introduce 2,600,000 sf of commercial uses to the area. Accordingly, the same potential for on-site hazards related to geology and soils, such as earthquakes, soil erosion, soil stability, and expansive soil, would occur under the Buildout Pursuant to Existing General Plan Alternative. In addition, because the Buildout Pursuant to Existing General Plan Alternative would eliminate the residential units, homes and residents would not be exposed to the aforementioned potential geological hazards. Because known mineral resources do not exist in the project area, impacts related to such would not occur. Nevertheless, the Buildout Pursuant to Existing General Plan Alternative would result in equal impacts associated with geology, soils, and mineral resources compared to the proposed project.

Hazards and Hazardous Materials

The Buildout Pursuant to Existing General Plan Alternative would involve similar site disturbance as the proposed project. Therefore, impacts related to exposure to any existing on-site hazards or hazardous materials would be similar under the Buildout Pursuant to Existing General Plan Alternative to the proposed project. As the Buildout Pursuant to Existing General Plan Alternative, would consist of employment-generating uses, impacts related to the creation of hazards to the public or the environment related to the routine transport, use, or disposal of hazardous materials would be similar to that of the proposed project. Overall, the Buildout Pursuant to Existing General Plan Alternative would result in equal impacts associated with hazards and hazardous materials as the proposed project.

Hydrology and Water Quality

Similar to the proposed project, land disturbance would occur during construction activities associated with the Buildout Pursuant to Existing General Plan Alternative. The Buildout Pursuant to Existing General Plan Alternative would alter the existing drainage pattern of the site and would result in the same impacts as the proposed project related to potential water quality and erosion issues. The Buildout Pursuant to Existing General Plan Alternative would involve the construction of business park offices on a similar area of disturbance as the proposed project. As such, the amount of impervious surfaces under the Buildout Pursuant to Existing General

Plan Alternative would be expected to be similar to that of the proposed project. As the site is not located within a floodplain, the same impacts related to placement of structures or housing within a floodplain and associated flooding risks would occur under the Buildout Pursuant to Existing General Plan Alternative as the proposed project. Overall, the Buildout Pursuant to Existing General Plan Alternative would result in equal hydrology and water quality related impacts, as compared to the proposed project.

Land Use and Planning / Agricultural Resources

Unlike the proposed project, the Buildout Pursuant to Existing General Plan Alternative would not require a General Plan Amendment of the Sand Creek Focus Area. The Buildout Pursuant to Existing General Plan Alternative would be consistent with the existing General Plan designation, Business Park, for the project site. Therefore, impacts related to land use consistency would be less than that of the proposed project.

Neither the proposed project nor the Buildout Pursuant to Existing General Plan Alternative would displace any existing housing or people, and the Buildout Pursuant to Existing General Plan Alternative would not create housing on the site. The Buildout Pursuant to Existing General Plan Alternative would eliminate the residential portion of the proposed project. Therefore, the Buildout Pursuant to Existing General Plan Alternative would include less of a population growth in the area than the proposed project. In conclusion, the Buildout Pursuant to Existing General Plan Alternative would result in fewer impacts than the proposed project related to land use and planning and population and housing.

The Buildout Pursuant to Existing General Plan Alternative would result in development of the same site, which is not designated as farmland or forest land. As such, the Alternative would result in similar impacts related to agricultural and forest resources as the proposed project.

Overall, the Buildout Pursuant to Existing General Plan Alternative would result in fewer impacts than the proposed project related to land use and planning, population and housing, and agricultural resources.

Noise

The Buildout Pursuant to Existing General Plan Alternative would eliminate the residential portion of the proposed project and develop a total of 2,600,000 sf of business park uses. Because the Buildout Pursuant to Existing General Plan Alternative would involve a similar overall area of disturbance as the proposed project, construction-related noise would likely be similar to what is expected for the proposed project. In addition, because the Buildout Pursuant to Existing General Plan Alternative would involve more square footage and would generate employees in the area, the increase in vehicle trips would be greater than that of the proposed project. The greater number of trips would result in greater traffic on area roadways and, thus, an increase in traffic-related noise levels. Therefore, the Buildout Pursuant to Existing General Plan Alternative would be expected to result in greater noise-related impacts than that of the proposed project.

Public Services, Recreation, and Utilities

Because the Buildout Pursuant to Existing General Plan Alternative would consist of buildout of 2,600,000 sf of business park uses on the same site as the prosed project, the increase in demand for law enforcement, fire protection services would be equal to that of the proposed project. Because the Buildout Pursuant to Existing General Plan Alternative would not involve residential development, the Alternative would not contribute to overcrowding at the elementary and high schools within the Brentwood Union and Liberty Union School Districts. In addition, the Buildout Pursuant to Existing General Plan Alternative and would dedicate 2.77 acres of land to park use. Because Buildout Pursuant to Existing General Plan Alternative would not involve any new residences in the area, the demand for solid waste disposal services and wastewater conveyance and treatment services would be less than expected for the proposed project. As such, the increase in demand for schools, recreation facilities, solid waste disposal services, and wastewater services would be less than that of the proposed project. However, as discussed on page 4.10-40 of the Public Services, Recreation, and Utilities chapter of this EIR, if the 141.6-acre site were to be developed as a Business Park, the projected water demand would be approximately 481 AFY (3.41 AFY/acre x 141.6 acres), which is greater than the 330 AFY projected for the proposed project.

Overall, development of the Buildout Pursuant to Existing General Plan Alternative would result in equal impacts related to public services and utilities to that of the proposed project.

Transportation and Circulation

Development of the Buildout Pursuant to Existing General Plan Alternative would result in the buildout of 2,600,000 sf of business park uses and would eliminate the residential portion of the proposed project, which would subsequently result in greater project-generated vehicle trips. The Buildout Pursuant to Existing General Plan Alternative would result in 29,692 average daily trips, which is approximately 23,502 more trips than the proposed project. Because greater vehicle trips would be generated by the Buildout Pursuant to Existing General Plan Alternative, the intensity of traffic-related impacts would be increased, as compared to the proposed project. Therefore, the Buildout Pursuant to Existing General Plan Alternative would still increase traffic on surrounding intersections and roadways. Furthermore, the Buildout Pursuant to Existing General Plan Alternative would also require mitigation measures, such as installation of bus turnouts and/or bus shelters, in order to reduce the potential impacts to alternative transportation to acceptable levels. Overall, development of the Buildout Pursuant to Existing General Plan Alternative would result in greater impacts related to transportation and circulation to that of the proposed project.

Executive Residential Alternative

The Executive Residential Alternative would achieve some of the proposed project's objectives. The Executive Residential Alternative would include the construction of 232 large-lot single family residences on 131 acres. The Executive Residential Alternative would reduce the total number of dwelling units from 650 to 232, a reduction of approximately 64 percent. The Executive Residential Alternative would incorporate two parks on the project site.

Aesthetics

Development of the Executive Residential Alternative would result in fewer residences than the proposed project, but on the same project site. Because the site is not visible from a state scenic highway and does not contain scenic resources, the Executive Residential Alternative would have no impact, similar to the proposed project, related to scenic vistas, and scenic resources, including but not limited to trees, rocks, and outcroppings within a state scenic highway. In addition, less-than-significant cumulative impacts would still occur under the Executive Residential Alternative similar to the proposed project. Because Executive Residential Alternative would result in the conversion of the project site to urban development, the Executive Residential Alternative would alter the existing visual character and quality of the site and the site's surroundings, and would introduce new sources of light and glare to the area. Any development on the project site, be it the Executive Residential Alternative or the proposed project, would be subject to the Citywide Design Guidelines requirements, such as design consistency, building materials, and lighting requirements. It should be noted that the Executive Residential Alternative would be consistent with the adjacent existing and planned residential developments to the west, north, and east. Therefore, the level of potential impacts associated with aesthetics, including potential cumulative impacts, would be expected to be equal under the Executive Residential Alternative as compared to the proposed project.

Air Quality and GHG Emissions

The Executive Residential Alternative would reduce the total number of dwelling units constructed on the project site by 418 dwelling units. Buildout of the site per the Executive Residential Alternative would result in a similar development footprint as the proposed project. Because the Executive Residential Alternative would involve a similar overall area of disturbance as the proposed project, construction-related emissions would likely be similar to what is expected for the proposed project. It should be noted that Mitigation Measure 4.2-1 of this EIR would reduce the construction-related emissions resulting from the Executive Residential Alternative.

Because the Executive Residential Alternative would involve fewer homes and future residents, emissions associated with vehicle trips, as well as area and energy sources, would be fewer than that of the proposed project. Using CalEEMod, the Executive Residential Alternative's operational emissions were estimated. The CalEEMod results are presented in Table 6-2. As shown in the table, the Executive Residential Alternative would result in fewer operational and cumulative criteria air pollutant emissions than the proposed project. As such, the Alternative would result in fewer impacts related to criteria air pollutant emissions than the proposed project.

Although, as shown in the table, the total GHG emissions associated with the Alternative would be less than that of the proposed project, the lesser population generated by the Alternative would cause the GHG emissions per service population to be greater than the proposed project. The GHG emissions per service population associated with the Executive Residential Alternative would exceed the applicable threshold of significance. Therefore, impacts related to GHG emissions would be greater under the Executive Residential Alternative than the proposed project.

Table 6-2
Unmitigated Executive Residential Alternative Emissions

Pollutant	Unmitigated Executive Residential Alternative Emissions	Unmitigated Proposed Project Emissions	BAAQMD Thresholds of Significance (lbs/day)
OPERATIONAL (lbs/day)			
ROG	16.85	45.70	54
NO_X	11.77	30.99	54
PM_{10}	11.82	30.95	82
$PM_{2.5}$	3.71	9.77	54
CUMULATIVE (tons/yr)			
ROG	2.80	7.73	10
NO_X	1.94	5.36	10
PM_{10}	1.89	5.25	15
$PM_{2.5}$	0.55	1.53	10
GHG ($MTCO_2e$/yr)			
Operational GHG Emissions	2,751.17	7,614.68	-
Total Annual GHG Emissions[1]	3,539.03	8,402.54	-
Service Population[2]	680	1,879	-
Total Annual GHG Emissions Per Service Population	**5.20**	**4.47**	**4.6**

Notes:
[1] Includes operational emissions plus construction emissions. For analysis purposes, the amortized construction-related GHG emissions were assumed to be similar to the proposed project under the Alternative (i.e., 787.86 $MTCO_2e$/yr).
[2] Service population calculated based on 2.93 persons per household.

Source: CalEEMod, June 2015.

Because the Executive Residential Alternative would result in fewer trips than the proposed project, the alternative would result in less traffic on area roadways. Therefore, the potential for the Alternative to result in high concentrations of localized CO emissions at nearby intersections would be less than that of the proposed project. As the Executive Residential Alternative would consist of buildout on the same site in the same location as the proposed project with the same land uses, the effects of the project, as well as on the project from nearby sources of TACs, would be similar to that of the proposed project.

Overall, the Executive Residential Alternative would result in fewer impacts than the proposed project related to air quality and GHG emissions.

Biological Resources

The Executive Residential Alternative would dedicate a similar area to park/open space uses as compared to the proposed project. However, the same potential exists for effects on existing habitat, interference with native or migratory wildlife species or corridors, confliction with policies or ordinance protecting biological resources, and confliction with provisions of an

adopted habitat conservation plan. Therefore, impacts related to biological resources would be equal under the Executive Residential Alternative to the proposed project.

Cultural Resources

Because the Executive Residential Alternative would be developed on the same site as the proposed project, the same potential exists for damage to or destruction of previously unknown prehistoric and/or historic cultural resources or human remains during ground disturbing activities. The same mitigation measures would be required under the Executive Residential Alternative as for the proposed project in order to reduce potential impacts to less-than-significant levels. Therefore, the overall potential impacts related to cultural resources would be equal under the Executive Residential Alternative as compared to the proposed project.

Geology, Soils, and Mineral Resources

Development of the Executive Residential Alternative would result in the same site disturbance as the proposed project, but would consist of buildout of 418 fewer residential units. Accordingly, the same potential for on-site hazards related to geology, soils, and seismicity, such as earthquakes, soil erosion, soil stability, and expansive soil, would occur under the Executive Residential Alternative. In addition, because the Executive Residential Alternative would involve fewer residential units, fewer homes and future residents would be exposed to the aforementioned potential geological hazards. Because known mineral resources do not exist in the project area, impacts related to such would not occur. Therefore, the Executive Residential Alternative would result in fewer impacts associated with geology, soils, and mineral resources compared to the proposed project.

Hazards and Hazardous Materials

The Executive Residential Alternative would involve the same site disturbance as the proposed project. Therefore, impacts related to exposure to any existing on-site hazards or hazardous materials would be similar under the Executive Residential Alternative to the proposed project. As the Executive Residential Alternative, like the proposed project, would consist of residential uses, impacts related to the creation of hazards to the public or the environment related to the routine transport, use, or disposal of hazardous materials would be similar to that of the proposed project. Overall, the Executive Residential Alternative would result in equal impacts associated with hazards and hazardous materials as the proposed project.

Hydrology and Water Quality

Similar to the proposed project, land disturbance would occur during construction activities associated with the Executive Residential Alternative. The Executive Residential Alternative would alter the existing drainage pattern of the site and would result in the same impacts as the proposed project related to potential water quality and erosion issues. However, the Executive Residential Alternative would involve the construction of 418 fewer residential units than the proposed project. As such, the amount of impervious surfaces under the Executive Residential Alternative would be expected to be slightly less than that of the proposed project. Therefore,

development of the Executive Residential Alternative would result in fewer impacts than that of the proposed project related to the effects on the existing stormwater drainage system capacity, contaminated runoff, and groundwater recharge.

As the site is not located within a floodplain, the same impacts related to placement of structures or housing within a floodplain and associated flooding risks would occur under the Executive Residential Alternative as the proposed project. Overall, the Executive Residential Alternative would result in fewer hydrology and water quality related impacts, as compared to the proposed project.

Land Use and Planning / Agricultural Resources

The Executive Residential Alternative would, like the proposed project, require a General Amendment of the Sand Creek Focus Area to the City of Pittsburg, approval of a Master Development Plan, Final Development Plan, and Planned Development rezone, approval of the tentative map, and approval of a development agreement. Should the Antioch City Council approve the requested entitlements, the project would be consistent with the land use and zoning designations for the site. Accordingly, impacts related to land use and planning would be similar under the Alternative as the proposed project.

Neither the proposed project nor the Executive Residential Alternative would displace any existing housing or people, and both would create housing on the site. The Executive Residential Alternative would reduce the total number of dwelling units built on the project site from 650 to 232. Accordingly, the Executive Residential Alternative would induce less population growth in the area than the proposed project. Therefore, impacts related to population and housing under the Alternative would be fewer than that of the proposed project.

The Executive Residential Alternative would result in development of the same site, which is not designated as farmland or forest land. As such, the Alternative would result in similar impacts related to agricultural and forest resources as the proposed project.

Overall, the Executive Residential Alternative would result in slightly fewer impacts related to land use and planning, population and housing, and agricultural resources.

Noise

Development of the Executive Residential Alternative would include the development of 418 fewer dwelling units. A reduction in the total number of dwelling units could also reduce the amount of construction time, thereby reducing construction-related noise and vibration impacts. Furthermore, because the Executive Residential Alternative would involve fewer future residents, noise levels associated with an increase in project-generated vehicle trips would be fewer than that of the proposed project. Therefore, the Executive Residential Alternative would result in fewer noise-related impacts than that of the proposed project.

Public Services, Recreation, and Utilities

Because the Executive Residential Alternative would consist of buildout of 418 fewer residential units, the increase in demand for public services and utilities including, but not limited to, water supply and delivery; wastewater collection and treatment, solid waste disposal, law enforcement, and fire protection would be less than that of the proposed project. In addition, the Executive Residential Alternative would contribute to overcrowding at the elementary and high schools within the Brentwood Union and Liberty Union School Districts but would dedicate 2.77 acres to park uses. Overall, development of the Executive Residential Alternative would result in fewer impacts related to public services and utilities than that of the proposed project.

Transportation and Circulation

Development of the Executive Residential Alternative would result in the buildout of 418 fewer dwelling units than the proposed project, which would subsequently result in fewer project-generated vehicle trips. The Executive Residential Alternative would result in 2,209 average daily trips, which is approximately 3,981 less trips than the proposed project. Because fewer vehicle trips would be generated by the Executive Residential Alternative, the intensity of traffic-related impacts would be reduced, as compared to the proposed project. It should be noted, however, that the Executive Residential Alternative would still increase traffic on surrounding intersections and roadways. Furthermore, the Executive Residential Alternative would also require mitigation measures, such as installation of bus turnouts and/or shelters, in order to reduce the potential impacts to alternative transportation to acceptable levels. Overall, the Executive Residential Alternative would result in fewer trips compared to the proposed project.

6.4 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

An EIR is required to identify the environmentally superior alternative from among the range of reasonable alternatives that are evaluated. Section 15126(e)(2) of the CEQA Guidelines requires that an environmentally superior alternative be designated and states, "If the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives."

Designating a superior alternative depends in large part on what environmental effects one considers most important. This EIR does not presume to make this determination; rather, the determinations of which impacts are more important are left to the reader and the decision makers. Generally, the environmentally superior alternative is the one that would result in the fewest environmental impacts as a result of project implementation. However, it should be noted that the environmental considerations are one portion of the factors that must be considered by the public and the decisionmakers in deliberations on the proposed project and the alternatives. Other factors of importance include urban design, economics, social factors, and fiscal considerations. In addition, the superior alternative would, ideally, still provide opportunities to achieve the project objectives.

Aside from the No Project Alternative, the development alternatives would meet some of the proposed project's objectives. However, because the Buildout Pursuant to Existing General Plan

Alternative would not involve residential development, the Alternative would meet fewer of the project objectives than the Executive Residential Alternative.

A comparison of the proposed project to the three alternatives discussed in detail above is illustrated in Table 6-3 below. As shown in the table, the Buildout Pursuant to Existing General Plan Alternative would result in fewer impacts than the proposed project in one resource areas (Land Use and Planning / Agricultural Resources), equal impacts in seven resource areas (Aesthetics; Biological Resources; Cultural Resources; Geology, Soils, and Mineral Resources; Hazards and Hazardous Materials; Hydrology and Water Quality; and Public Services, Recreation, and Utilities), and greater impacts in three resources areas (Air Quality and GHG Emissions; Noise; and Transportation and Circulation). The Executive Residential Alternative would result in fewer impacts than the proposed project in seven resource areas (Air Quality and GHG Emissions; Geology, Soils, and Mineral Resources; Hydrology and Water Quality; Land Use and Planning / Agricultural Resources; Noise; Public Services, Recreation, and Utilities; and Transportation and Circulation) and equal impacts in four resource areas (Aesthetics; Biological Resources; Cultural Resources; and Hazards and Hazardous Materials). The Executive Residential Alternative would not result in greater impacts than the proposed project in any resource area.

Therefore, because the Executive Residential Alternative would meet the most of the project objectives and would result in fewer impacts than the proposed project in the most resource areas, in comparison to the other development alternatives, the Executive Residential Alternative would be considered the Environmentally Superior Alternative.

Table 6-3
Alternative Environmental Impacts Comparison

Resource Area	Proposed Project	No Project (No Build) Alternative	Buildout Pursuant to Existing General Plan Alternative	Executive Residential Alternative
Aesthetics	Less-Than-Significant with Mitigation	None	Equal	Equal
Air Quality and GHG Emissions	Less-Than-Significant with Mitigation	None	Greater	Fewer
Biological Resources	Less-Than-Significant with Mitigation	None	Equal	Equal
Cultural Resources	Less-Than-Significant with Mitigation	None	Equal	Equal
Geology, Soils, and Mineral Resources	Less-Than-Significant With Mitigation	None	Equal	Fewer
Hazards and Hazardous Materials	Less-Than-Significant with Mitigation	None	Equal	Equal
Hydrology and Water Quality	Less-Than-Significant	None	Equal	Fewer
Land Use and Planning / Agricultural Resources	Less-Than-Significant	Greater	Fewer	Fewer
Noise	Less-Than-Significant with Mitigation	None	Greater	Fewer
Public Services, Recreation, and Utilities	Less-Than-Significant with Mitigation	None	Equal	Fewer
Transportation and Circulation	Less-Than-Significant with Mitigation	None	Greater	Fewer

Notes:
No Impact = "None"
Less than Proposed Project = "Fewer"
Equal to Proposed Project = "Equal"
Greater than Proposed Project = "Greater"

7. REFERENCES

7 REFERENCES

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8. EIR AUTHORS AND PERSONS CONSULTED

8 EIR AUTHORS AND PERSONS CONSULTED

RANEY PLANNING & MANAGEMENT, INC.

C. Timothy Raney, AICP	President
Cindy Gnos, AICP	Senior Vice President
Nick Pappani	Vice President
Rod Stinson	Division Manager / Air Quality Specialist
Angela Stinson	Senior Associate / Air Quality Technician
Elise Carroll	Associate
Kevin Valente	Associate

FEHR & PEERS

Katherin Tellez	Senior Associate

MONK AND ASSICOCIATES

Mr. Geoff Monk	Principal Biologist

J.C. BRENNAN & ASSOCIATES

Luke Saxelby	Senior Consultant

BALANCE HYDROLOGICS

Edward D. Ballman	Principal Engineer
Adam Rianda	Engineer/Hydrologist

GEOCON CONSULTANTS INC.

Shane Rocacker	Senior Engineer
John E. Juhrend	Senior Engineer

RIC WINDMILLER, M.A., R.P.A

Ric Windmiller	Consulting Archeologist

ENGEO INCORPORATED

Jennifer R. Boteho	Project Geologist
Shawn Munger	Principal

WEST YOST ASSOCIATES

Jim Connell	Consulting Engineer

RMC WATER AND ENVIRONMENT

Paul Glenn	Senior Hydrogeologist

APPENDIX A

NOTICE OF PREPARATION

DATE: September 9, 2014

TO: State Clearinghouse
1400 10th Street, Suite 222
Sacramento, CA 95814
(916) 445-0613

FROM: City of Antioch

SUBJECT: Promenade Project
Notice of Preparation of a Draft Environmental Impact Report

LEAD AGENCY: City of Antioch
Community Development Department
Contact: Tina Wehrmeister
P.O. Box 5007
Antioch, CA 94531-5007
(925) 779-7035
twehrmeister@ci.antioch.ca.us

PROJECT APPLICANT: GBN Partners LLC

Notice is hereby given that the City of Antioch will be the Lead Agency and will prepare an environmental impact report (EIR) for the proposed Promenade project. We are requesting comments on the scope of topics addressed in this EIR.

Please provide comments on the scope of the EIR to Tina Wehrmeister, Community Development Director, at the address listed above. Due to the time limits mandated by State law, your response must be sent at the earliest possible date, but not later than 5:00 PM on October 9, 2014. In your response, please identify a contact person in your agency for future correspondence.

The Lead Agency will hold a public scoping meeting to receive verbal comments on Wednesday, September 17, 2014 at 6:30 PM in the City of Antioch Council Chambers, Third and "H" Streets, Antioch, CA 94509.

INTRODUCTION:

The purpose of an EIR is to inform decision-makers and the general public of the environmental effects of a proposed project. The EIR process is intended to provide environmental information sufficient to evaluate a proposed project and its potential to cause significant effects on the environment; examine methods of reducing adverse environmental impacts; and consider alternatives to the proposed project. The Promenade Project EIR will be prepared and processed in accordance with the California Environmental Quality Act (CEQA) and the CEQA Guidelines. The EIR will generally include the following:

- Description of the project;

- Description of the existing environmental setting for each topic, potential environmental impacts of the project, and mitigation measures;
- Cumulative impacts; and
- Alternatives to the project.

PROJECT LOCATION:

The Promenade Project (proposed project) is located in the southeastern portion of the City of Antioch in eastern Contra Costa County, California (see Figure 1, Regional Project Location, and Figure 2, Project Vicinity). The City of Antioch is bordered to the north by the San Joaquin River Delta; to the east by the City of Brentwood and the City of Oakley; to the west by the City of Pittsburg and unincorporated portions of Contra Costa County; and to the south by unincorporated portions of Contra Costa County. In addition, the project site is located within the northeastern corner of the Sand Creek Focus Area, or Future Urban Area (FUA-1), which contains lands designated by the Antioch General Plan for open space, residential, business park, commercial, and mixed-use development. The project site is bounded by a residential subdivision to the north, Sand Creek to the south, Heidorn Ranch Road and City of Brentwood City limits to the east, and future Hillcrest Avenue extension and vacant residential land to the west. The site is identified by the following Contra Costa County Assessor's Parcel Numbers (APNs): all of 057-030-003, a portion of 057-030-004, and a portion of 057-050-017.

The project site consists of approximately 141 acres of undeveloped, farm land, designated as Business Park, Public/Quasi Public, and Open Space/Senior Housing within the Sand Creek Focus Area of the City of Antioch General Plan. The site is zoned Study Zone in the Antioch Zoning Ordinance. The project site is surrounded by a mixture of uses including existing single-family residential uses to the north; the undeveloped but approved Aviano residential project to the west, undeveloped land planned for future residential, mixed use, and commercial development in Brentwood to the east; and Sand Creek, a PG&E facility, and undeveloped farm land to the south (planned for future residential in the City of Antioch's General Plan). The project site's existing General Plan land use designations are shown in Figure 3, Existing General Plan Designations. The proposed land uses in the vicinity of the project site are shown in Figure 4, Proposed General Plan Designations.

PROJECT SITE CHARACTERISTICS:

The project site consists of both on-site (referred to as the "project site") and off-site impact areas. Both areas are described in detail below.

- *Project Site.* The 141-acre project site is comprised of two parcels, collectively called the Promenade Project. The southeastern 10 acres of the project site is known as the Aera property, which is identified by APN 057-030-003. The remaining 131 acres of the project site is identified by a portion of APN 057-030-004 and a portion of 057-050-017. The project site is primarily covered with non-native vegetation and historic aerial photos show the property has been farmed and disked since the 1930's. The project site previously contained three oil/gas wells that were abandoned by plugging in 1981 and 1991. The site is generally rectangular; however, the southern boundary shifts north and south in an irregular shape, as shown in Figure 2. The site's terrain is generally flat and the existing topography falls from southwest to southeast at approximately one percent slope with elevations ranging from 150 to 175 feet above mean sea level. Sand Creek, a tributary of Marsh Creek, flows in a northeastern direction and is located south of the project site. A 25-foot wide Shell Oil Company easement runs in an east-west direction across the southern portion of the site. An above-ground Calpine dehydration station servicing a 10-inch Calpine gas line is located at the far southeast corner of the Aera property.

The dehydration station is active, will remain active, and is regularly checked by Calpine employees. The above-ground facilities at the station include piping and cabinets with an approximate 80-foot by 20-foot footprint, standing approximately five feet tall. An approximately 58-foot wide PG&E pipeline easement with a 36-inch pipeline below ground runs in a north-south direction across the eastern edge of the project site adjacent to Heidorn Ranch Road.

- *Off-Site Impact Areas.* The proposed project would construct off-site improvements (i.e. roadways and utilities) that would affect two off-site, adjacent properties totaling approximately 6.47 acres. One off-site area to the north and east includes an approximately 6.02-acre portion of Heidorn Ranch Road (a dedicated public roadway in Antioch). The proposed project may affect the frontage of five private properties along the roadway alignment. The five adjacent properties are primarily flat and consist of private homes with ornamental plantings and, in one case, land planted in row crops. The second off-site area of approximately 0.4 acres to the southeast includes a portion of Sand Creek. Storm drain lines from the project's southern detention basin and a new storm drain outfall are proposed within the 0.4-acre off-site area. The off-site area is also primarily flat up to the creek top-of-bank, and a paved PG&E access road to a nearby PG&E facility traverses the alignment south of the site.

PROJECT DESCRIPTION:

The applicant is proposing to construct a residential development, including up to 650 single-family residential units on 127.5 acres; 31.6 acres of parks and landscaped areas; extension of Heidorn Ranch Road, Hillcrest Avenue, and Sand Creek Road; extension of a portion of the Sand Creek Trail for connection to other City and regional trails with associated parking; and utility improvements (see Figure 5, Preliminary Site Plan). The following provides a summary of the project's primary components.

- *Residential Concept.* The proposed project includes development of up to 650 single-family residential units on approximately 127.5 acres north of the future alignment of Sand Creek Road. The average density of the residential development would be approximately 5.03 units per gross acre. The proposed project would be constructed in two main phases arranged into six neighborhoods. At least six different housing layouts with three different elevations would be constructed on lots ranging from approximately 4,200 to 5,160 square feet.

- *Recreation, Landscaping and Open Space.* The proposed project includes the development of recreational, park, and landscape areas within the residential area. The proposed project would include the construction of a detention basin south of the residential area and extension of the Sand Creek Trail, with the remaining acreage as undeveloped open space adjacent to the Sand Creek buffer area. In addition, the proposed project would include a focus on drought-tolerant and adaptive plant species. Approximately 25 percent of the site would be set aside for open space and buffer uses, as described in detail below:
    - *Promenade Central Park.* An approximate 2.1-acre park space would be located in the middle of the project site. Separate parking would also be provided if recreational facilities, such as a community building or pool were incorporated in the Promenade Central Park.
    - *Promenade Southeastern Park.* An approximate 7.5-acre park space with a 3.5-acre detention basin would be located in the southeastern corner of the project site.
    - *Sand Creek Regional Trail.* A segment of the Sand Creek Regional Trail would be constructed within the project site. The trail would connect to the planned trail to the west, by the Aviano Project, and would transition to the public sidewalk to the east along Sand Creek Road.

- *Southern Detention Basin Surrounding Open Space.* Approximately 5.7 acres of open space would be included around and adjacent to the detention basin located south of Sand Creek Road.
- *Landscaping.* Landscaping would be provided throughout the project site on a total of approximately 31.6 acres.

- *Circulation, Parking and Streetscape.* Vehicular entrances and exits to the project site would be provided along the east side of the project site by improving up to 2,380 linear feet of Heidorn Ranch Road to a four-lane divided roadway from south of the East Bay Municipal Utility District (EBMUD) Mokelumne Aqueduct right-of-way to the main entrance. In addition, Heidorn Ranch Road would be extended to intersect with Sand Creek Road.

  On the west side of the project site, a 1,265 linear foot improvement to Hillcrest Avenue as a four-lane divided roadway (previously approved and permitted by the Aviano Residential project) would be provided as a second entrance along the westerly boundary of the site.

  The Sand Creek Road four-lane divided roadway would be graded and constructed to include the northern curb and gutter, sidewalk, and landscaping, but construction of the roadway would not occur until the lanes are warranted. Traffic signals would be installed at the project entries and eventually at the major intersections (Hillcrest Avenue and Heidorn Ranch Road) with Sand Creek Road, when warranted. Pedestrian access to the site would be provided by sidewalks located on the roadways adjacent to the project site.

  Interior vehicular circulation would be provided by a traditional grid pattern of two-way streets that connect back to a wider, central spine entry street, referred to as a Promenade. Each residential unit would have a two-car garage and driveway with additional street parking. Roadway and pedestrian facilities are depicted in Figure 5.

- *Utilities and Infrastructure.* Public utilities, including potable water, sanitary sewer, stormwater drainage, power, and telecommunication services, are not currently provided on the project site. The following section describes how the proposed project would improve the site to provide standard services.
  - *Water Service.* Potable water would be distributed to the project site by an existing 12-inch Zone III trunk line beneath Heidorn Ranch Road. The line would be extended within Heidorn Ranch Road south to Sand Creek Road and west within Sand Creek Road to create a loop to connect with the 16-inch Zone III trunk line in Hillcrest Avenue.
  - *Sanitary Sewer.* If not already completed by the adjacent developer (the sewer line was previously approved and permitted for the Aviano Residential project), the proposed project would extend the existing 24-inch sanitary sewer pipe, located at Heidorn Ranch Road, northeast of the project site. The pipe would be extended south along the future alignment of Heidorn Ranch Road to the project entry and west through the Promenade to the Hillcrest Avenue entry.
  - *Storm Water.* Approximately one-third of the eastern part of the site (approximately 35 acres) would drain to the smaller proposed stormwater detention/water quality basin located within the Promenade southeastern park. The balance of the site would drain to the larger proposed stormwater detention/water quality basin south of Sand Creek Road. The basins would then drain through engineered outlets to Sand Creek. The basins would provide mitigation for detention, water quality, and hydromodification.
  - *Power and Communications.* Electricity to the project site would be provided by PG&E. AT&T provides telephone and internet service and Comcast and Astound provide cable

television and internet services city-wide. Dry utilities, electrical, gas, and technology lines would be extended from the existing lines beneath Heidorn Ranch Road and Hillcrest Avenue and looped between the two through Sand Creek Road.

- *Project Construction.* Project grading would be balanced onsite. Construction of the proposed project would be conducted in two main phases arranged into six neighborhoods. Phase 1 of the project would most likely commence in 2017; and Phase 2 of construction is expected to be completed in 2022.

PROJECT ENTITLEMENTS AND APPROVALS:

Requested project entitlements are anticipated to include the following:

- *General Plan Amendment.* The project would require the approval of a General Plan Amendment of the Sand Creek Focus Area from Business Park, Public/Quasi-Public, and Open Space/Senior Housing designations to Medium Low Density Residential.
- *Planned Development Rezone.* The project would require the approval of a Master Development Plan and Planned Development Rezone. The Master Development Plan and Planned Development District would list the development standards applicable to the project site, including setbacks, lot sizes, and building heights.
- *Tentative Map.* Tentative Map approval is required to authorize the subdivision of the project site into multiple parcels to accommodate up to 650 single-family residential units as well as recreational, parks, and open space parcels.
- *Use Permit.* A Use Permit is required to further clarify the details of each phase of the proposed project and to ensure that each component complies with established provisions of the proposed Planned Development District.
- *Design Review.* Design Review is required to authorize the proposed conceptual architecture, landscaping, and site design of the residential community and to ensure consistency with the City of Antioch's General Plan and Zoning Ordinance design policies and criteria, except where specifically amended by the approvals.
- *Development Agreement.* The Development Agreement approval allows the City and an applicant to enter into an agreement, which will assure the City that the proposed project will proceed to its completion in compliance with the plans submitted by the applicant.

PROBABLE ENVIRONMENTAL EFFECTS:

The City has reviewed the proposed project application and has determined that an EIR should be prepared for the proposed project because it may have a significant effect on the environment. The City has concluded that the EIR should address potential project-related impacts to the resources identified below. Each resource area chapter will include a discussion of the existing setting, thresholds of significance, evaluation of potential impacts, and if necessary, feasible mitigation measures to reduce or eliminate potentially significant impacts to the applicable resource.

- Aesthetics
- Air Quality and Greenhouse Gas Emissions
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hazards and Hazardous Materials

- Hydrology and Water Quality
- Land Use and Planning / Agricultural and Forestry Resources / Population and Housing
- Noise
- Public Services and Utilities
- Transportation and Circulation
- Statutorily Required Sections
- Alternatives

September 9, 2014

Tina Wehrmeister — Date
Community Development Director, City of Antioch

FIGURE 1
REGIONAL PROJECT LOCATION

FIGURE 2
PROJECT VICINITY

FIGURE 3
EXISTING GENERAL PLAN DESIGNATIONS

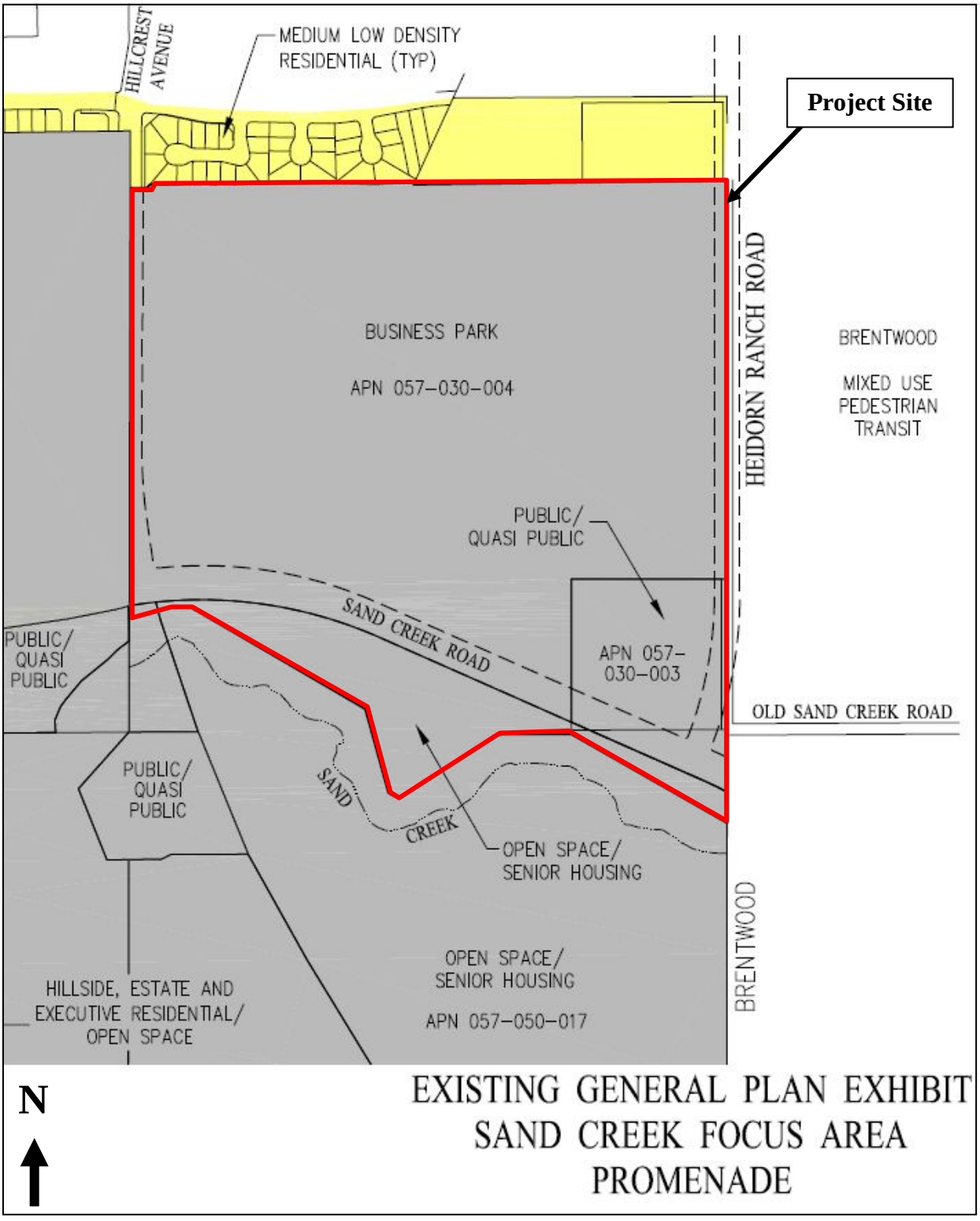

FIGURE 4
PROPOSED GENERAL PLAN AMENDMENT

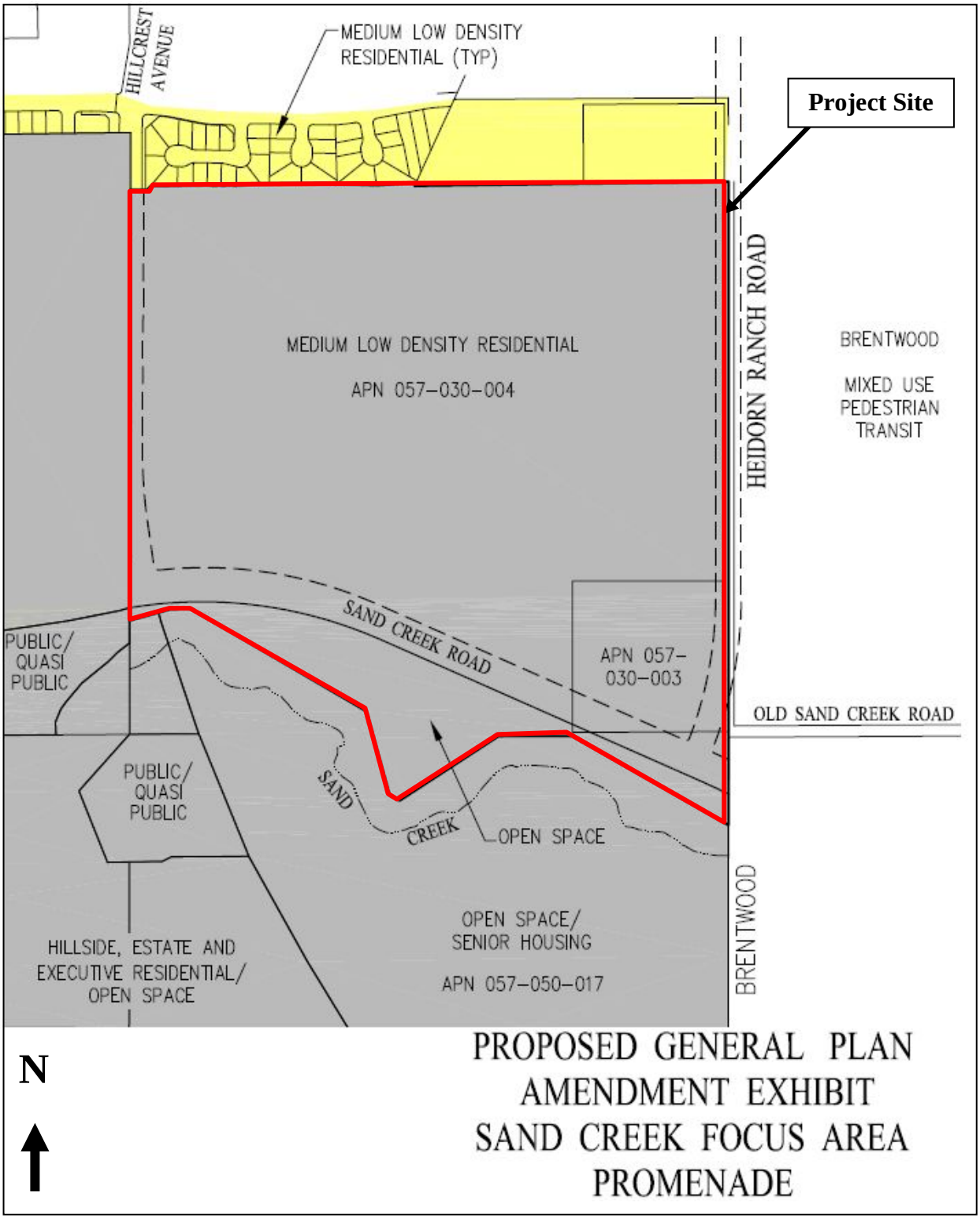

FIGURE 5
PRELIMINARY SITE PLAN

APPENDIX B

ADAMS BROADWELL JOSEPH & CARDOZO
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
601 GATEWAY BOULEVARD, SUITE 1000
SOUTH SAN FRANCISCO, CA 94080-7037
TEL: (650) 589-1660
FAX: (650) 589-5062
mquinn@adamsbroadwell.com

DANIEL L. CARDOZO
THOMAS A. ENSLOW
TANYA A. GULESSERIAN
LAURA E. HORTON
MARC D. JOSEPH
RACHAEL E. KOSS
JAMIE L. MAULDIN
MEGHAN A. QUINN
ADAM J. REGELE
ELLEN L. TRESCOTT

SACRAMENTO OFFICE
520 CAPITOL MALL, SUITE 350
SACRAMENTO, CA 95814-4721
TEL: (916) 444-6201
FAX: (916) 444-6209

September 18, 2014

Via U.S. and Electronic Mail

Tina Wehrmeister
Director, Community Development Department
City of Antioch
P.O. Box 5007
Antioch, CA 94531
Email: Twehrmeister@ci.antioch.ca.us

Arne Simonsen
City Clerk
City of Antioch
P.O. Box 5007
Antioch, CA 94531
Email: Asimonsen@ci.antioch.ca.us

Re: Request for Mailed Notice of CEQA Actions and Public Hearings – Promenade Project in Antioch

Dear Ms. Wehrmeister:

We are writing on behalf of International Brotherhood of Electrical Workers Local 302, Plumbers & Steamfitters Local 159 and Sheet Metal Workers Local 104 to request mailed notice of the availability of any environmental review document, prepared pursuant to the California Environmental Quality Act ("CEQA"), related to the Promenade Project ("Project"). GBN Partners, LLC ("Applicant") is proposing the construction of 650 single family homes on approximately 141 acres in the City of Antioch, east of the future extension of Hillcrest Avenue and to the west of Heidorn Ranch Road at Assessor Parcel Numbers ("APNs"): 057-030-003, 057-030-004 and 057-050-017.

We also request mailed notice of any and all hearings and/or actions related to the Project. These requests are made pursuant to Public Resources Code

Sections 21092.2, 21080.4, 21083.9, 21092, 21108 and 21152 and Government Code Section 65092, which require local agencies to mail such notices to any person who has filed a written request for them with the clerk of the agency's governing body.

Please send the above requested items by email and U.S. Mail to our South San Francisco Office as follows:

U.S. Mail

Janet M. Laurain
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080-7037

Email

jlaurain@adamsbroadwell.com

Sincerely,

Meghan A. Quinn

MAQ:clv

State of California – The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
(707) 944-5500
www.wildlife.ca.gov

EDMUND G. BROWN JR., *Governor*
CHARLTON H. BONHAM, *Director*

October 8, 2014

Ms. Tina Wehrmeister
City of Antioch
Post Office Box 5007
Antioch, CA 94509

Dear Ms. Wehrmeister:

Subject: Promenade Project, Notice of Preparation, SCH #2014092010, City of Antioch, Contra Costa County

The California Department of Fish and Wildlife (CDFW) has reviewed the documents provided for the subject project, and we have the following comments.

Please provide a complete assessment (including but not limited to type, quantity and locations) of the habitats, flora and fauna within and adjacent to the project area, including endangered, threatened, and locally unique species and sensitive habitats. The assessment should include the reasonably foreseeable direct and indirect changes (temporary and permanent) that may occur with implementation of the project. Rare, threatened and endangered species to be addressed should include all those which meet the California Environmental Quality Act (CEQA) definition (see CEQA Guidelines, Section 15380). CDFW recommended survey and monitoring protocols and guidelines are available at http://www.CDFW.ca.gov/biogeodata/cnddb/pdfs/Protocols_for_Surveying_and_Evaluating_Impacts.pdf.

Please be advised that a California Endangered Species Act (CESA) Permit must be obtained if the project has the potential to result in take of species of plants or animals listed under CESA, either during construction or over the life of the project. Issuance of a CESA Permit is subject to CEQA documentation; therefore, the CEQA document must specify impacts, mitigation measures, and a mitigation monitoring and reporting program. If the project will impact CESA listed species, early consultation is encouraged, as significant modification to the project and mitigation measures may be required in order to obtain a CESA Permit.

For any activity that will divert or obstruct the natural flow, or change the bed, channel, or bank (which may include associated riparian resources) of a river or stream, or use material from a streambed, CDFW may require a Lake and Streambed Alteration Agreement (LSAA), pursuant to Section 1600 et seq. of the Fish and Game Code, with the applicant. Issuance of an LSAA is subject to CEQA. CDFW, as a responsible agency under CEQA, will consider the CEQA document for the project. The CEQA document should fully identify

the potential impacts to the stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for completion of the agreement. To obtain information about the LSAA notification process, please access our website at http://www.dfg.ca.gov/habcon/1600/; or to request a notification package, contact CDFW's Bay Delta Regional Office at (707) 944-5500.

If you have any questions, please contact Mr. Robert Stanley, Environmental Scientist, at (707) 944-5573; or Ms. Annee Ferranti, Senior Environmental Scientist (Supervisory), at (707) 944-5554.

Sincerely,

Scott Wilson
Regional Manager
Bay Delta Region

cc: State Clearinghouse

CALIFORNIA
Water Boards

Central Valley Regional Water Quality Control Board

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

1 October 2014

Tina Wehrmeister
City of Antioch
PO BOX 5007
Antioch, CA 94531

CERTIFIED MAIL
7014 1200 0000 7154 4738

COMMENTS TO NOTICE OF PREPARATION FOR THE PROMENADE PROJECT, SCH NO. 2014092010, CONTRA COSTA COUNTY

Pursuant to the State Clearinghouse's 5 September 2014 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Notice of Preparation* for the Promenade Project, located in Contra Costa County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

For more information on the Construction General Permit, visit the State Water Resources Control Board website at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits[1]

The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/.

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Industrial Storm Water General Permit

Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 97-03-DWQ.

For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml.

Clean Water Act Section 404 Permit

If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACOE). If a Section 404 permit is required by the USACOE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements.

If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACOE at (916) 557-5250.

[1] Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACOE permit, or any other federal permit, is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications.

Waste Discharge Requirements

If USACOE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project will require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation.

For more information on the Water Quality Certification and WDR processes, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/help/business_help/permit2.shtml.

Low or Limited Threat General NPDES Permit

If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for *Dewatering and Other Low Threat Discharges to Surface Waters* (Low Threat General Order) or the General Order for *Limited Threat Discharges of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Superchlorination Projects, and Other Limited Threat Wastewaters to Surface Water* (Limited Threat General Order). A complete application must be submitted to the Central Valley Water Board to obtain coverage under these General NPDES permits.

For more information regarding the Low Threat General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0074.pdf

For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0073.pdf

If you have questions regarding these comments, please contact me at (916) 464-4684 or tcleak@waterboards.ca.gov.

Trevor Cleak
Environmental Scientist

cc: State Clearinghouse Unit, Governor's Office of Planning and Research, Sacramento

October 8th, 2014

Tina Wehrmeister
Community Development Director
City of Antioch, Community Development Department
P.O. Box 5007
Antioch, CA 94531

RE: Comments on Notice of Preparation (NOP) of a Draft Environmental Impact Report (dEIR) for the Proposed Antioch Promenade Project

Dear Ms. Wehrmeister,

Save Mount Diablo (SMD) is a non-profit conservation organization founded in 1971 which acquires land for addition to parks on and around Mount Diablo and monitors land use planning which might affect protected lands. We build trails, restore habitat, and are involved in environmental education. In 1971 there was just one park on Mount Diablo totaling 6,778 acres; today there are almost 50 parks and preserves around Mount Diablo totaling 110,000 acres. We include more than 8,000 donors and supporters.

We appreciate the opportunity to comment on the NOP for a dEIR of the proposed Promenade Project (Project). We have some major concerns about the Project, discussed below, that should be considered in how this Project progresses and addressed in the draft EIR.

Comprehensive area-wide environmental analysis in dEIR

The Sand Creek Focus Area (Focus Area) of the Antioch General Plan already identifies land use designations for the area where the proposed Project would be built. Most of the project site (103 acres) is designated as Business Park, but the Project proposes to change this to Medium Low Density Residential to allow the construction of up to 650 single family homes. The Focus Area does not even currently include the Medium Low Density Residential designation.

Given that the Project proposes drastic changes to land use designations established in the General Plan and that current designations in the Focus Area include other designations that could in the future be changed in favor of higher density housing like the Project, we feel that that a comprehensive area-wide environmental analysis makes more sense than a piecemeal project-by-project approach.

The Project itself proposes a large land use designation change, and the neighboring Aviano project seems to offer higher-density housing than the original low density residential designation in the General Plan. If each project proposed for the Focus Area changes the original designation on a piecemeal project-by-project, the area will develop very differently than what City leaders and the public intended. An updated comprehensive planning approach to this area should be implemented in order to avoid such an outcome.

Growth inducement and cumulative impacts section
Aside from the proposed project site, Blackhawk Nunn (the applicant) has optioned a variety of adjacent parcels in the area. Therefore what happens on the proposed Project site could affect proposed development plans on the other parcels that have been optioned. Changing the land use of most of the project site from Business Park to residential indicates that more housing than what is envisioned in the General Plan could be proposed for these areas.

Therefore, this project has the potential to induce growth in Antioch, Brentwood and the region as a whole beyond the scope of the Project itself. The dEIR cumulative and growth inducing impacts sections should discuss this and provide as much detail as possible in identifying what other parcels are controlled by the applicant in the area and what development is contemplated.

Project impacts to Sand Creek and other biologically sensitive areas, implications for mitigation
The proposed Project footprint abuts Sand Creek to the south. Sand Creek is an important riparian and wildlife corridor, even in a degraded condition. Its three-dimensional vegetation structure and the riparian species found there support a rich biological community and serve as a stopover point for migrating and locally moving wildlife. It is likely the most biodiverse habitat area in the Focus Area.

The Project would lead to a number of direct and indirect impacts to Sand Creek, including potential impacts to its hydrology, wildlife mortality on the proposed San Creek Rd., greater invasive species presence due to the construction of houses and roads, and impacts to water quality due to pesticide, motor oil, and other types of runoff from the development. These impacts and many others must be thoroughly analyzed in the dEIR, as well as the large creek setbacks that should be required and wildlife over- or under-crossings along the road.

In addition, the dEIR should include extensive detail on the mitigation proposed for such impacts. Potential opportunities that should be explored include habitat restoration projects in parts of Sand Creek further to the west or wherever such projects would most benefit special-status species, acquisition of conservation easements or fee-title purchase of land along the creek and on either side of it to be managed as natural parkland, and a clear greenbelt plan between Brentwood and Antioch. Protection of Sand Creek and its surroundings running the length of the Focus Area should be discussed, as well as how mitigation for development projects throughout the Focus Area could be coordinated to connect the protected lands to the west and south of the Focus Area.

The entire project site is identified in the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP) as potential breeding and/or suitable migration/aestivation habitat for California red-legged frog and California tiger salamander. The biological section of the dEIR should include a full discussion of the occurrence of these and all other potentially occurring special status species in the vicinity of the project site as well as the impacts of the proposed Project on these species. This should include occurrence data as well as identification of specific potential breeding sites (i.e., Sand Creek). The fact that the area has been extensively disced should not be used to make blanket assertions that the area is not suitable habitat, as research has demonstrated these species can inhabit certain types of modified and/or artificial habitats.

The approximately 31 acres of park and open space (including a detention basin) the Project currently proposes is not nearly enough mitigation for 1) a residential subdivision of this size and 2) a proposal to change job-generating land uses (Business Park) to a residential one. Recreational parkland cannot in any way be used to mitigate for the loss of open space, and details of the detention basin area should be fully discussed with reference to its effects on hydrology, native vegetation, and wildlife. If conservation

easements or fee-title purchases are proposed for open space mitigation, the dEIR should detail how these lands would be managed over the long term, the funding that would pay for their long-term management, and which entities would be responsible for them.

Housing imbalance and greenhouse gas (GHG) analysis
Changing the land use designations of the project site from Business Park to Medium Low Density Residential exacerbates the current severe jobs:housing imbalance in Antioch and east Contra Costa County (East County) as a whole. The original land use designation was meant to provide jobs close to where people already live and reduce the already horrific traffic going into east County through Highway 4 and other routes. There are far fewer jobs in East County than households, and adding more houses at the project site only adds more long distance commuters in traffic on Highway 4 and other routes.

The increased traffic on Highway 4 that would be caused by the Project should be analyzed in the dEIR traffic section, as well as the cumulative impacts section of the dEIR. The dEIR should not limit itself to analyzing traffic at the project site. It should include a thorough analysis of the additional commuters going into Central County that the Project would create, the emissions associated with such long-distance commuters, and how these emissions would impact local and state-level greenhouse gas emissions reduction goals.

Discussion of potential Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP) implications
The State of California was recently awarded a federal grant to assist the City of Antioch in preparation of an HCP/NCCP. The dEIR should include a discussion of how the Project would fit in to such a plan, including potential mitigation requirements, a timetable for implementation of the HCP/NCCP, whether project timing and HCP/NCCP development could realistically accommodate the Project as part of the HCP/NCCP, and permit requirements and authorization processes relevant to the Project.

Trail connections and increasing opportunities for walking
The dEIR should include a recreation section that discusses Project impacts to the existing regional trail network as well as opportunities to connect and expand trails, including discussions of the Mokelumne Coast to Crest Regional Trail just to the east. The Project should ensure at least several connections to the trail system from Antioch and Brentwood into Black Diamond Mines Regional Preserve. In addition, there should also be a realistic analysis of opportunities that future Project residents will have to walk in and out of the Project without having to drive. The Project dimensions presented during the scoping session in September seemed to inhibit many residents from walking to the proposed open space in the southern portion of the project due to insufficient walking paths within and connecting outside the residential area.

Since the project proposes replacing a job-creating land use designation with a residential one that will increase commuter traffic, a mitigation measure that should be included and fully discussed in the dEIR is the need for a pedestrian bridge over Highway 4 and complete or partial funding for such a bridge by the Project. This bridge was a requirement of the Highway 4 Bypass project that has not been implemented. The dEIR and future land use documents related to the Focus Area should indicate that funding the pedestrian bridge crossing over Highway 4 should be a component of future development projects in order to ensure non-motorized connectivity across Highway 4.

Toxics analysis section
Given the history of oil and gas exploration and associated infrastructure on and around the Project site, the dEIR should include an extensive and detailed toxics section. There should be a discussion of known

existing and potential contaminants on and around the site and how the Project will remove or remediate these substances and prevent them from seeping or leeching into Sand Creek and proposed open space.

Thank you for the opportunity to provide comments.

Regards,

Juan Pablo Galván
Land Use Planner

CC:

Mr. Brian Holt, East Bay Regional Park District
Mr. Robert Stanley, California Department of Fish and Wildlife
Ms. Diane Burgis, Friends of Marsh Creek Watershed
Mr. Joel Devalcourt, Greenbelt Alliance
Mr. Timothy Donahue, Sierra Club – Delta Group

NOP Scoping Meeting for the Promenade Project EIR – September 17, 2014

Planning Commission

Commissioners showed concern on the following chapters:

- Open Space – Conservation buffer for Sand Creek
- Water Quality – Drainage into Sand Creek (possible mitigation of signage for drains, enhancements to Creek)
- Biological Resources – Mitigation for impacted species (tiered approach, may need federal permits, participate in Regional Habitat Conservation Plan)
- Agricultural Resources – Mitigation in Antioch or outside area?
- Transportation and Circulation – James Donlan Extension (JDE)
- Transportation and Circulation – East County development and impacts on existing roadways
- Land Use – Dwelling units per acre is incorrect in NOP

Public – Juan Pablo Galvan, Land Use Planner from Save Mount Diablo (925) 947-0642

- Cumulative impacts addressed in EIR?
- Growth-inducing impacts addressed in EIR?
- General Plan Amendment may increase growth and result in impacts to the jobs-housing balance
- Stop re-designated land use and piecemeal the City together but rather take a comprehensive approach
- The proposed residential land uses will increase traffic to the central County which would increase greenhouse gas emissions.
- Detention basin and vineyard too close to Sand Creek (pesticides from vineyard)
- The development requires additional open space. Land Purchase Agreement? Conservation Easement? Quantity of acreage? Who would hold the easement?
- Contaminants and toxins addressed in EIR?
- What will happen to the southern parcel? Should consider for open space mitigation
- Recreation Chapter in EIR? Need to address the Mokelumne Coast to Crest Trail network.

APPENDIX C

Vineyards at Sand Creek

Contra Costa County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	641.00	Dwelling Unit	141.00	1,153,800.00	1833

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - based on project description and traffic report assumptions

Construction Phase - based on information provided by the applicant

Grading - based on information from applicant

Architectural Coating -

Vehicle Trips - based on traffic report

Area Mitigation -

Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	220.00	1,695.00
tblConstructionPhase	NumDays	3,100.00	1,695.00
tblConstructionPhase	NumDays	310.00	130.00
tblConstructionPhase	NumDays	220.00	15.00
tblConstructionPhase	NumDays	120.00	45.00
tblConstructionPhase	PhaseEndDate	12/20/2030	7/5/2024
tblConstructionPhase	PhaseStartDate	6/22/2024	1/8/2018
tblConstructionPhase	PhaseStartDate	12/23/2017	12/25/2017
tblConstructionPhase	PhaseStartDate	6/3/2017	6/5/2017
tblConstructionPhase	PhaseStartDate	12/2/2017	12/4/2017
tblGrading	AcresOfGrading	325.00	141.00
tblLandUse	LotAcreage	208.12	141.00
tblProjectCharacteristics	OperationalYear	2014	2024
tblVehicleTrips	ST_TR	10.08	9.52
tblVehicleTrips	SU_TR	8.77	9.52
tblVehicleTrips	WD_TR	9.57	9.52

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	6.1733	69.6804	47.8610	0.0704	18.2360	3.3186	20.9915	9.9757	3.0531	12.5108	0.0000	6,503.2841	6,503.2841	1.9436	0.0000	6,544.0991
2018	14.1134	31.8041	39.0980	0.0787	3.0699	1.7452	4.8151	0.8234	1.6477	2.4711	0.0000	7,012.6323	7,012.6323	0.7943	0.0000	7,029.3131
2019	13.6408	28.7666	37.1638	0.0786	3.0698	1.5080	4.5778	0.8233	1.4239	2.2472	0.0000	6,864.8286	6,864.8286	0.7721	0.0000	6,881.0415
2020	13.2780	25.9286	35.6361	0.0786	3.0697	1.3099	4.3796	0.8233	1.2368	2.0600	0.0000	6,692.5612	6,692.5612	0.7547	0.0000	6,708.4093
2021	12.9619	23.2154	34.3611	0.0786	3.0698	1.1283	4.1982	0.8233	1.0651	1.8884	0.0000	6,649.9485	6,649.9485	0.7402	0.0000	6,665.4932
2022	12.7013	20.8361	33.3510	0.0786	3.0700	0.9658	4.0358	0.8234	0.9121	1.7355	0.0000	6,612.5407	6,612.5407	0.7310	0.0000	6,627.8908
2023	12.4886	18.9803	32.4743	0.0786	3.0701	0.8444	3.9145	0.8234	0.7974	1.6208	0.0000	6,575.6330	6,575.6330	0.7206	0.0000	6,590.7650
2024	12.3286	17.8933	31.7668	0.0786	3.0702	0.7487	3.8189	0.8235	0.7065	1.5299	0.0000	6,546.2579	6,546.2579	0.7127	0.0000	6,561.2243
Total	**97.6859**	**237.1046**	**291.7121**	**0.6206**	**39.7254**	**11.5691**	**50.7313**	**15.7393**	**10.8425**	**26.0637**	**0.0000**	**53,457.6861**	**53,457.6861**	**7.1691**	**0.0000**	**53,608.2362**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	6.1733	69.6804	47.8610	0.0704	18.2360	3.3186	20.9915	9.9757	3.0531	12.5108	0.0000	6,503.2841	6,503.2841	1.9436	0.0000	6,544.0991
2018	14.1134	31.8041	39.0980	0.0787	3.0699	1.7452	4.8151	0.8234	1.6477	2.4711	0.0000	7,012.6323	7,012.6323	0.7943	0.0000	7,029.3131
2019	13.6408	28.7666	37.1638	0.0786	3.0698	1.5080	4.5778	0.8233	1.4239	2.2472	0.0000	6,864.8286	6,864.8286	0.7721	0.0000	6,881.0415
2020	13.2780	25.9286	35.6361	0.0786	3.0697	1.3099	4.3796	0.8233	1.2368	2.0600	0.0000	6,692.5612	6,692.5612	0.7547	0.0000	6,708.4093
2021	12.9619	23.2154	34.3611	0.0786	3.0698	1.1283	4.1982	0.8233	1.0651	1.8884	0.0000	6,649.9485	6,649.9485	0.7402	0.0000	6,665.4932
2022	12.7013	20.8361	33.3510	0.0786	3.0700	0.9658	4.0358	0.8234	0.9121	1.7355	0.0000	6,612.5407	6,612.5407	0.7310	0.0000	6,627.8908
2023	12.4886	18.9803	32.4743	0.0786	3.0701	0.8444	3.9145	0.8234	0.7974	1.6208	0.0000	6,575.6330	6,575.6330	0.7206	0.0000	6,590.7650
2024	12.3286	17.8933	31.7668	0.0786	3.0702	0.7487	3.8189	0.8235	0.7065	1.5299	0.0000	6,546.2579	6,546.2579	0.7127	0.0000	6,561.2243
Total	**97.6859**	**237.1046**	**291.7121**	**0.6206**	**39.7254**	**11.5691**	**50.7313**	**15.7393**	**10.8425**	**26.0637**	**0.0000**	**53,457.6861**	**53,457.6861**	**7.1691**	**0.0000**	**53,608.2362**

	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**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1,179.2406	15.7792	1,443.6678	0.4662		195.0599	195.0599		195.0541	195.0541	20,227.7373	8,805.2809	29,033.0181	16.2446	1.6428	29,883.4069
Energy	0.6682	5.7103	2.4299	0.0365		0.4617	0.4617		0.4617	0.4617		7,289.7268	7,289.7268	0.1397	0.1336	7,334.0909
Mobile	14.8343	23.0653	128.4077	0.4247	28.8363	0.4497	29.2859	7.6994	0.4152	8.1146		31,027.3682	31,027.3682	0.9813		31,047.9759
Total	**1,194.7431**	**44.5547**	**1,574.5054**	**0.9273**	**28.8363**	**195.9712**	**224.8075**	**7.6994**	**195.9310**	**203.6303**	**20,227.7373**	**47,122.3758**	**67,350.1131**	**17.3657**	**1.7764**	**68,265.4736**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	30.3368	0.6091	52.9403	2.7900e-003		1.2960	1.2960		1.2854	1.2854	0.0000	15,931.6926	15,931.6926	0.3949	0.2903	16,029.9894
Energy	0.5290	4.5205	1.9236	0.0289		0.3655	0.3655		0.3655	0.3655		5,770.8460	5,770.8460	0.1106	0.1058	5,805.9665
Mobile	14.8343	23.0653	128.4077	0.4247	28.8363	0.4497	29.2859	7.6994	0.4152	8.1146		31,027.3682	31,027.3682	0.9813		31,047.9759
Total	**45.7000**	**28.1949**	**183.2716**	**0.4563**	**28.8363**	**2.1111**	**30.9474**	**7.6994**	**2.0661**	**9.7655**	**0.0000**	**52,729.9068**	**52,729.9068**	**1.4868**	**0.3961**	**52,883.9318**

	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	**96.17**	**36.72**	**88.36**	**50.79**	**0.00**	**98.92**	**86.23**	**0.00**	**98.95**	**95.20**	**100.00**	**-11.90**	**21.71**	**91.44**	**77.70**	**22.53**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/3/2017	6/2/2017	5	45	
2	Grading	Grading	6/5/2017	12/1/2017	5	130	
3	Paving	Paving	12/4/2017	12/22/2017	5	15	
4	Building Construction	Building Construction	12/25/2017	6/21/2024	5	1695	
5	Architectural Coating	Architectural Coating	1/8/2018	7/5/2024	5	1695	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 141

Acres of Paving: 0

Residential Indoor: 2,336,445; Residential Outdoor: 778,815; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Excavators	2	8.00	162	0.38
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	125	0.42
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	130	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Building Construction	Welders	1	8.00	46	0.45

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
Site Preparation	7	18.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	231.00	69.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	46.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.8382	51.7535	39.3970	0.0391		2.7542	2.7542		2.5339	2.5339		4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**4.8382**	**51.7535**	**39.3970**	**0.0391**	**18.0663**	**2.7542**	**20.8205**	**9.9307**	**2.5339**	**12.4646**		**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0667	0.0795	0.9503	2.1200e-003	0.1698	1.2700e-003	0.1710	0.0450	1.1700e-003	0.0462		170.9236	170.9236	8.2500e-003		171.0968
Total	**0.0667**	**0.0795**	**0.9503**	**2.1200e-003**	**0.1698**	**1.2700e-003**	**0.1710**	**0.0450**	**1.1700e-003**	**0.0462**		**170.9236**	**170.9236**	**8.2500e-003**		**171.0968**

3.2 Site Preparation - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.8382	51.7535	39.3970	0.0391		2.7542	2.7542		2.5339	2.5339	0.0000	4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**4.8382**	**51.7535**	**39.3970**	**0.0391**	**18.0663**	**2.7542**	**20.8205**	**9.9307**	**2.5339**	**12.4646**	**0.0000**	**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0667	0.0795	0.9503	2.1200e-003	0.1698	1.2700e-003	0.1710	0.0450	1.1700e-003	0.0462		170.9236	170.9236	8.2500e-003		171.0968
Total	**0.0667**	**0.0795**	**0.9503**	**2.1200e-003**	**0.1698**	**1.2700e-003**	**0.1710**	**0.0450**	**1.1700e-003**	**0.0462**		**170.9236**	**170.9236**	**8.2500e-003**		**171.0968**

3.3 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1723	0.0000	7.1723	3.4344	0.0000	3.4344			0.0000			0.0000
Off-Road	6.0991	69.5920	46.8050	0.0617		3.3172	3.3172		3.0518	3.0518		6,313.3690	6,313.3690	1.9344		6,353.9915
Total	**6.0991**	**69.5920**	**46.8050**	**0.0617**	**7.1723**	**3.3172**	**10.4895**	**3.4344**	**3.0518**	**6.4862**		**6,313.3690**	**6,313.3690**	**1.9344**		**6,353.9915**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0741	0.0884	1.0559	2.3500e-003	0.1886	1.4100e-003	0.1900	0.0500	1.3000e-003	0.0513		189.9151	189.9151	9.1700e-003		190.1076
Total	**0.0741**	**0.0884**	**1.0559**	**2.3500e-003**	**0.1886**	**1.4100e-003**	**0.1900**	**0.0500**	**1.3000e-003**	**0.0513**		**189.9151**	**189.9151**	**9.1700e-003**		**190.1076**

3.3 Grading - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1723	0.0000	7.1723	3.4344	0.0000	3.4344			0.0000			0.0000
Off-Road	6.0991	69.5920	46.8050	0.0617		3.3172	3.3172		3.0518	3.0518	0.0000	6,313.3690	6,313.3690	1.9344		6,353.9915
Total	**6.0991**	**69.5920**	**46.8050**	**0.0617**	**7.1723**	**3.3172**	**10.4895**	**3.4344**	**3.0518**	**6.4862**	**0.0000**	**6,313.3690**	**6,313.3690**	**1.9344**		**6,353.9915**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0741	0.0884	1.0559	2.3500e-003	0.1886	1.4100e-003	0.1900	0.0500	1.3000e-003	0.0513		189.9151	189.9151	9.1700e-003		190.1076
Total	**0.0741**	**0.0884**	**1.0559**	**2.3500e-003**	**0.1886**	**1.4100e-003**	**0.1900**	**0.0500**	**1.3000e-003**	**0.0513**		**189.9151**	**189.9151**	**9.1700e-003**		**190.1076**

3.4 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9074	20.2964	14.7270	0.0223		1.1384	1.1384		1.0473	1.0473		2,281.0588	2,281.0588	0.6989		2,295.7360
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9074**	**20.2964**	**14.7270**	**0.0223**		**1.1384**	**1.1384**		**1.0473**	**1.0473**		**2,281.0588**	**2,281.0588**	**0.6989**		**2,295.7360**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0556	0.0663	0.7920	1.7600e-003	0.1415	1.0600e-003	0.1425	0.0375	9.8000e-004	0.0385		142.4363	142.4363	6.8800e-003		142.5807
Total	**0.0556**	**0.0663**	**0.7920**	**1.7600e-003**	**0.1415**	**1.0600e-003**	**0.1425**	**0.0375**	**9.8000e-004**	**0.0385**		**142.4363**	**142.4363**	**6.8800e-003**		**142.5807**

3.4 Paving - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9074	20.2964	14.7270	0.0223		1.1384	1.1384		1.0473	1.0473	0.0000	2,281.0588	2,281.0588	0.6989		2,295.7360
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9074**	**20.2964**	**14.7270**	**0.0223**		**1.1384**	**1.1384**		**1.0473**	**1.0473**	**0.0000**	**2,281.0588**	**2,281.0588**	**0.6989**		**2,295.7360**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0556	0.0663	0.7920	1.7600e-003	0.1415	1.0600e-003	0.1425	0.0375	9.8000e-004	0.0385		142.4363	142.4363	6.8800e-003		142.5807
Total	**0.0556**	**0.0663**	**0.7920**	**1.7600e-003**	**0.1415**	**1.0600e-003**	**0.1425**	**0.0375**	**9.8000e-004**	**0.0385**		**142.4363**	**142.4363**	**6.8800e-003**		**142.5807**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730		2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**3.1024**	**26.4057**	**18.1291**	**0.0268**		**1.7812**	**1.7812**		**1.6730**	**1.6730**		**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.7196	5.9963	7.2493	0.0164	0.4578	0.0879	0.5457	0.1306	0.0808	0.2114		1,617.0603	1,617.0603	0.0123		1,617.3189
Worker	0.8561	1.0205	12.1961	0.0272	2.1784	0.0163	2.1947	0.5778	0.0150	0.5928		2,193.5190	2,193.5190	0.1059		2,195.7428
Total	**1.5757**	**7.0169**	**19.4454**	**0.0436**	**2.6362**	**0.1043**	**2.7404**	**0.7083**	**0.0959**	**0.8042**		**3,810.5793**	**3,810.5793**	**0.1182**		**3,813.0618**

3.5 Building Construction - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730	0.0000	2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**3.1024**	**26.4057**	**18.1291**	**0.0268**		**1.7812**	**1.7812**		**1.6730**	**1.6730**	**0.0000**	**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.7196	5.9963	7.2493	0.0164	0.4578	0.0879	0.5457	0.1306	0.0808	0.2114		1,617.0603	1,617.0603	0.0123		1,617.3189
Worker	0.8561	1.0205	12.1961	0.0272	2.1784	0.0163	2.1947	0.5778	0.0150	0.5928		2,193.5190	2,193.5190	0.1059		2,195.7428
Total	**1.5757**	**7.0169**	**19.4454**	**0.0436**	**2.6362**	**0.1043**	**2.7404**	**0.7083**	**0.0959**	**0.8042**		**3,810.5793**	**3,810.5793**	**0.1182**		**3,813.0618**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6687	23.2608	17.5327	0.0268		1.4943	1.4943		1.4048	1.4048		2,609.9390	2,609.9390	0.6387		2,623.3517
Total	**2.6687**	**23.2608**	**17.5327**	**0.0268**		**1.4943**	**1.4943**		**1.4048**	**1.4048**		**2,609.9390**	**2,609.9390**	**0.6387**		**2,623.3517**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6409	5.4348	6.5630	0.0163	0.4577	0.0815	0.5391	0.1305	0.0749	0.2054		1,588.5677	1,588.5677	0.0121		1,588.8217
Worker	0.7685	0.9196	10.9647	0.0272	2.1784	0.0158	2.1942	0.5778	0.0146	0.5924		2,112.0881	2,112.0881	0.0974		2,114.1333
Total	**1.4095**	**6.3544**	**17.5277**	**0.0435**	**2.6361**	**0.0973**	**2.7333**	**0.7083**	**0.0895**	**0.7978**		**3,700.6558**	**3,700.6558**	**0.1095**		**3,702.9550**

3.5 Building Construction - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6687	23.2608	17.5327	0.0268		1.4943	1.4943		1.4048	1.4048	0.0000	2,609.9389	2,609.9389	0.6387		2,623.3517
Total	**2.6687**	**23.2608**	**17.5327**	**0.0268**		**1.4943**	**1.4943**		**1.4048**	**1.4048**	**0.0000**	**2,609.9389**	**2,609.9389**	**0.6387**		**2,623.3517**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6409	5.4348	6.5630	0.0163	0.4577	0.0815	0.5391	0.1305	0.0749	0.2054		1,588.5677	1,588.5677	0.0121		1,588.8217
Worker	0.7685	0.9196	10.9647	0.0272	2.1784	0.0158	2.1942	0.5778	0.0146	0.5924		2,112.0881	2,112.0881	0.0974		2,114.1333
Total	**1.4095**	**6.3544**	**17.5277**	**0.0435**	**2.6361**	**0.0973**	**2.7333**	**0.7083**	**0.0895**	**0.7978**		**3,700.6558**	**3,700.6558**	**0.1095**		**3,702.9550**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3516	20.9650	17.1204	0.0268		1.2850	1.2850		1.2083	1.2083		2,580.7618	2,580.7618	0.6279		2,593.9479
Total	**2.3516**	**20.9650**	**17.1204**	**0.0268**		**1.2850**	**1.2850**		**1.2083**	**1.2083**		**2,580.7618**	**2,580.7618**	**0.6279**		**2,593.9479**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5977	4.9618	6.2257	0.0163	0.4576	0.0757	0.5333	0.1305	0.0696	0.2001		1,561.0921	1,561.0921	0.0118		1,561.3400
Worker	0.7018	0.8376	9.9876	0.0272	2.1784	0.0155	2.1939	0.5778	0.0143	0.5921		2,036.0745	2,036.0745	0.0905		2,037.9757
Total	**1.2995**	**5.7994**	**16.2133**	**0.0435**	**2.6360**	**0.0912**	**2.7271**	**0.7083**	**0.0840**	**0.7922**		**3,597.1667**	**3,597.1667**	**0.1023**		**3,599.3157**

3.5 Building Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3516	20.9650	17.1204	0.0268		1.2850	1.2850		1.2083	1.2083	0.0000	2,580.7618	2,580.7618	0.6279		2,593.9479
Total	**2.3516**	**20.9650**	**17.1204**	**0.0268**		**1.2850**	**1.2850**		**1.2083**	**1.2083**	**0.0000**	**2,580.7618**	**2,580.7618**	**0.6279**		**2,593.9479**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5977	4.9618	6.2257	0.0163	0.4576	0.0757	0.5333	0.1305	0.0696	0.2001		1,561.0921	1,561.0921	0.0118		1,561.3400
Worker	0.7018	0.8376	9.9876	0.0272	2.1784	0.0155	2.1939	0.5778	0.0143	0.5921		2,036.0745	2,036.0745	0.0905		2,037.9757
Total	**1.2995**	**5.7994**	**16.2133**	**0.0435**	**2.6360**	**0.0912**	**2.7271**	**0.7083**	**0.0840**	**0.7922**		**3,597.1667**	**3,597.1667**	**0.1023**		**3,599.3157**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1113	19.0839	16.8084	0.0268		1.1128	1.1128		1.0465	1.0465		2,542.4799	2,542.4799	0.6194		2,555.4880
Total	**2.1113**	**19.0839**	**16.8084**	**0.0268**		**1.1128**	**1.1128**		**1.0465**	**1.0465**		**2,542.4799**	**2,542.4799**	**0.6194**		**2,555.4880**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5597	4.2364	5.9559	0.0163	0.4575	0.0678	0.5253	0.1305	0.0624	0.1928		1,525.3295	1,525.3295	0.0115		1,525.5700
Worker	0.6516	0.7709	9.2069	0.0272	2.1784	0.0153	2.1937	0.5778	0.0142	0.5919		1,954.1630	1,954.1630	0.0851		1,955.9493
Total	**1.2113**	**5.0073**	**15.1628**	**0.0434**	**2.6359**	**0.0831**	**2.7190**	**0.7082**	**0.0765**	**0.7848**		**3,479.4925**	**3,479.4925**	**0.0965**		**3,481.5192**

3.5 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1113	19.0839	16.8084	0.0268		1.1128	1.1128		1.0465	1.0465	0.0000	2,542.4799	2,542.4799	0.6194		2,555.4880
Total	**2.1113**	**19.0839**	**16.8084**	**0.0268**		**1.1128**	**1.1128**		**1.0465**	**1.0465**	**0.0000**	**2,542.4799**	**2,542.4799**	**0.6194**		**2,555.4880**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5597	4.2364	5.9559	0.0163	0.4575	0.0678	0.5253	0.1305	0.0624	0.1928		1,525.3295	1,525.3295	0.0115		1,525.5700
Worker	0.6516	0.7709	9.2069	0.0272	2.1784	0.0153	2.1937	0.5778	0.0142	0.5919		1,954.1630	1,954.1630	0.0851		1,955.9493
Total	**1.2113**	**5.0073**	**15.1628**	**0.0434**	**2.6359**	**0.0831**	**2.7190**	**0.7082**	**0.0765**	**0.7848**		**3,479.4925**	**3,479.4925**	**0.0965**		**3,481.5192**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8931	17.3403	16.5376	0.0268		0.9549	0.9549		0.8979	0.8979		2,542.7817	2,542.7817	0.6126		2,555.6462
Total	**1.8931**	**17.3403**	**16.5376**	**0.0268**		**0.9549**	**0.9549**		**0.8979**	**0.8979**		**2,542.7817**	**2,542.7817**	**0.6126**		**2,555.6462**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5279	3.4861	5.6663	0.0163	0.4576	0.0611	0.5187	0.1305	0.0562	0.1867		1,523.4004	1,523.4004	0.0114		1,523.6405
Worker	0.6158	0.7190	8.6226	0.0272	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,919.9839	1,919.9839	0.0808		1,921.6805
Total	**1.1437**	**4.2051**	**14.2889**	**0.0434**	**2.6360**	**0.0763**	**2.7124**	**0.7083**	**0.0703**	**0.7786**		**3,443.3843**	**3,443.3843**	**0.0922**		**3,445.3210**

3.5 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8931	17.3403	16.5376	0.0268		0.9549	0.9549		0.8979	0.8979	0.0000	2,542.7817	2,542.7817	0.6126		2,555.6462
Total	**1.8931**	**17.3403**	**16.5376**	**0.0268**		**0.9549**	**0.9549**		**0.8979**	**0.8979**	**0.0000**	**2,542.7817**	**2,542.7817**	**0.6126**		**2,555.6462**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5279	3.4861	5.6663	0.0163	0.4576	0.0611	0.5187	0.1305	0.0562	0.1867		1,523.4004	1,523.4004	0.0114		1,523.6405
Worker	0.6158	0.7190	8.6226	0.0272	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,919.9839	1,919.9839	0.0808		1,921.6805
Total	**1.1437**	**4.2051**	**14.2889**	**0.0434**	**2.6360**	**0.0763**	**2.7124**	**0.7083**	**0.0703**	**0.7786**		**3,443.3843**	**3,443.3843**	**0.0922**		**3,445.3210**

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	lb/day										lb/day					
Off-Road	1.6992	15.5364	16.3276	0.0268		0.8057	0.8057		0.7581	0.7581		2,543.7497	2,543.7497	0.6085		2,556.5286
Total	**1.6992**	**15.5364**	**16.3276**	**0.0268**		**0.8057**	**0.8057**		**0.7581**	**0.7581**		**2,543.7497**	**2,543.7497**	**0.6085**		**2,556.5286**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5139	3.0834	5.4960	0.0162	0.4578	0.0602	0.5180	0.1306	0.0554	0.1859		1,522.3492	1,522.3492	0.0117		1,522.5944
Worker	0.5838	0.6737	8.1007	0.0272	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,888.8576	1,888.8576	0.0771		1,890.4764
Total	**1.0978**	**3.7570**	**13.5967**	**0.0434**	**2.6362**	**0.0754**	**2.7115**	**0.7083**	**0.0695**	**0.7778**		**3,411.2068**	**3,411.2068**	**0.0888**		**3,413.0708**

3.5 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6992	15.5364	16.3276	0.0268		0.8057	0.8057		0.7581	0.7581	0.0000	2,543.7497	2,543.7497	0.6085		2,556.5286
Total	**1.6992**	**15.5364**	**16.3276**	**0.0268**		**0.8057**	**0.8057**		**0.7581**	**0.7581**	**0.0000**	**2,543.7497**	**2,543.7497**	**0.6085**		**2,556.5286**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5139	3.0834	5.4960	0.0162	0.4578	0.0602	0.5180	0.1306	0.0554	0.1859		1,522.3492	1,522.3492	0.0117		1,522.5944
Worker	0.5838	0.6737	8.1007	0.0272	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,888.8576	1,888.8576	0.0771		1,890.4764
Total	**1.0978**	**3.7570**	**13.5967**	**0.0434**	**2.6362**	**0.0754**	**2.7115**	**0.7083**	**0.0695**	**0.7778**		**3,411.2068**	**3,411.2068**	**0.0888**		**3,413.0708**

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	lb/day										lb/day					
Off-Road	1.5661	14.3126	16.2093	0.0268		0.6967	0.6967		0.6557	0.6557		2,544.6262	2,544.6262	0.6044		2,557.3191
Total	**1.5661**	**14.3126**	**16.2093**	**0.0268**		**0.6967**	**0.6967**		**0.6557**	**0.6557**		**2,544.6262**	**2,544.6262**	**0.6044**		**2,557.3191**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4828	2.6048	5.3072	0.0162	0.4579	0.0587	0.5166	0.1306	0.0540	0.1846		1,518.3847	1,518.3847	0.0108		1,518.6113
Worker	0.5541	0.6337	7.6278	0.0271	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,860.6541	1,860.6541	0.0738		1,862.2044
Total	**1.0369**	**3.2385**	**12.9350**	**0.0433**	**2.6363**	**0.0739**	**2.7102**	**0.7084**	**0.0681**	**0.7765**		**3,379.0388**	**3,379.0388**	**0.0846**		**3,380.8157**

3.5 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5661	14.3126	16.2093	0.0268		0.6967	0.6967		0.6557	0.6557	0.0000	2,544.6262	2,544.6262	0.6044		2,557.3191
Total	**1.5661**	**14.3126**	**16.2093**	**0.0268**		**0.6967**	**0.6967**		**0.6557**	**0.6557**	**0.0000**	**2,544.6262**	**2,544.6262**	**0.6044**		**2,557.3191**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4828	2.6048	5.3072	0.0162	0.4579	0.0587	0.5166	0.1306	0.0540	0.1846		1,518.3847	1,518.3847	0.0108		1,518.6113
Worker	0.5541	0.6337	7.6278	0.0271	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,860.6541	1,860.6541	0.0738		1,862.2044
Total	**1.0369**	**3.2385**	**12.9350**	**0.0433**	**2.6363**	**0.0739**	**2.7102**	**0.7084**	**0.0681**	**0.7765**		**3,379.0388**	**3,379.0388**	**0.0846**		**3,380.8157**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4653	13.3774	16.1332	0.0268		0.6106	0.6106		0.5744	0.5744		2,545.1154	2,545.1154	0.6009		2,557.7349
Total	**1.4653**	**13.3774**	**16.1332**	**0.0268**		**0.6106**	**0.6106**		**0.5744**	**0.5744**		**2,545.1154**	**2,545.1154**	**0.6009**		**2,557.7349**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4674	2.5796	5.1615	0.0162	0.4580	0.0590	0.5170	0.1307	0.0543	0.1850		1,518.9274	1,518.9274	0.0108		1,519.1549
Worker	0.5267	0.5984	7.2235	0.0271	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,835.2967	1,835.2967	0.0710		1,836.7866
Total	**0.9941**	**3.1779**	**12.3850**	**0.0433**	**2.6364**	**0.0742**	**2.7106**	**0.7084**	**0.0684**	**0.7768**		**3,354.2241**	**3,354.2241**	**0.0818**		**3,355.9415**

3.5 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4653	13.3774	16.1332	0.0268		0.6106	0.6106		0.5744	0.5744	0.0000	2,545.1154	2,545.1154	0.6009		2,557.7349
Total	**1.4653**	**13.3774**	**16.1332**	**0.0268**		**0.6106**	**0.6106**		**0.5744**	**0.5744**	**0.0000**	**2,545.1154**	**2,545.1154**	**0.6009**		**2,557.7349**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4674	2.5796	5.1615	0.0162	0.4580	0.0590	0.5170	0.1307	0.0543	0.1850		1,518.9274	1,518.9274	0.0108		1,519.1549
Worker	0.5267	0.5984	7.2235	0.0271	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,835.2967	1,835.2967	0.0710		1,836.7866
Total	**0.9941**	**3.1779**	**12.3850**	**0.0433**	**2.6364**	**0.0742**	**2.7106**	**0.7084**	**0.0684**	**0.7768**		**3,354.2241**	**3,354.2241**	**0.0818**		**3,355.9415**

3.6 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.0102
Total	**9.8822**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.0102**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1530	0.1831	2.1835	5.4100e-003	0.4338	3.1400e-003	0.4369	0.1151	2.9100e-003	0.1180		420.5890	420.5890	0.0194		420.9962
Total	**0.1530**	**0.1831**	**2.1835**	**5.4100e-003**	**0.4338**	**3.1400e-003**	**0.4369**	**0.1151**	**2.9100e-003**	**0.1180**		**420.5890**	**420.5890**	**0.0194**		**420.9962**

3.6 Architectural Coating - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506	0.0000	281.4485	281.4485	0.0267		282.0102
Total	**9.8822**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.0102**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1530	0.1831	2.1835	5.4100e-003	0.4338	3.1400e-003	0.4369	0.1151	2.9100e-003	0.1180		420.5890	420.5890	0.0194		420.9962
Total	**0.1530**	**0.1831**	**2.1835**	**5.4100e-003**	**0.4338**	**3.1400e-003**	**0.4369**	**0.1151**	**2.9100e-003**	**0.1180**		**420.5890**	**420.5890**	**0.0194**		**420.9962**

3.6 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		281.9473
Total	**9.8500**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**281.9473**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1398	0.1668	1.9889	5.4100e-003	0.4338	3.0800e-003	0.4369	0.1151	2.8500e-003	0.1179		405.4521	405.4521	0.0180		405.8307
Total	**0.1398**	**0.1668**	**1.9889**	**5.4100e-003**	**0.4338**	**3.0800e-003**	**0.4369**	**0.1151**	**2.8500e-003**	**0.1179**		**405.4521**	**405.4521**	**0.0180**		**405.8307**

3.6 Architectural Coating - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		281.9473
Total	**9.8500**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**281.9473**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1398	0.1668	1.9889	5.4100e-003	0.4338	3.0800e-003	0.4369	0.1151	2.8500e-003	0.1179		405.4521	405.4521	0.0180		405.8307
Total	**0.1398**	**0.1668**	**1.9889**	**5.4100e-003**	**0.4338**	**3.0800e-003**	**0.4369**	**0.1151**	**2.8500e-003**	**0.1179**		**405.4521**	**405.4521**	**0.0180**		**405.8307**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9057
Total	**9.8257**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9057**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1298	0.1535	1.8334	5.4100e-003	0.4338	3.0400e-003	0.4368	0.1151	2.8200e-003	0.1179		389.1407	389.1407	0.0169		389.4964
Total	**0.1298**	**0.1535**	**1.8334**	**5.4100e-003**	**0.4338**	**3.0400e-003**	**0.4368**	**0.1151**	**2.8200e-003**	**0.1179**		**389.1407**	**389.1407**	**0.0169**		**389.4964**

3.6 Architectural Coating - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9057
Total	**9.8257**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9057**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1298	0.1535	1.8334	5.4100e-003	0.4338	3.0400e-003	0.4368	0.1151	2.8200e-003	0.1179		389.1407	389.1407	0.0169		389.4964
Total	**0.1298**	**0.1535**	**1.8334**	**5.4100e-003**	**0.4338**	**3.0400e-003**	**0.4368**	**0.1151**	**2.8200e-003**	**0.1179**		**389.1407**	**389.1407**	**0.0169**		**389.4964**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.8537
Total	**9.8025**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.8537**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1226	0.1432	1.7171	5.4100e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		382.3345	382.3345	0.0161		382.6723
Total	**0.1226**	**0.1432**	**1.7171**	**5.4100e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**382.3345**	**382.3345**	**0.0161**		**382.6723**

3.6 Architectural Coating - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.8537
Total	**9.8025**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.8537**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1226	0.1432	1.7171	5.4100e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		382.3345	382.3345	0.0161		382.6723
Total	**0.1226**	**0.1432**	**1.7171**	**5.4100e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**382.3345**	**382.3345**	**0.0161**		**382.6723**

3.6 Architectural Coating - 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	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.8329
Total	**9.7881**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.8329**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1163	0.1342	1.6131	5.4100e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		376.1362	376.1362	0.0154		376.4585
Total	**0.1163**	**0.1342**	**1.6131**	**5.4100e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**376.1362**	**376.1362**	**0.0154**		**376.4585**

3.6 Architectural Coating - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.8329
Total	**9.7881**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.8329**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1163	0.1342	1.6131	5.4100e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		376.1362	376.1362	0.0154		376.4585
Total	**0.1163**	**0.1342**	**1.6131**	**5.4100e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**376.1362**	**376.1362**	**0.0154**		**376.4585**

3.6 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	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8017
Total	**9.7752**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8017**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1103	0.1262	1.5190	5.4100e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		370.5199	370.5199	0.0147		370.8286
Total	**0.1103**	**0.1262**	**1.5190**	**5.4100e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**370.5199**	**370.5199**	**0.0147**		**370.8286**

3.6 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8017
Total	**9.7752**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8017**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1103	0.1262	1.5190	5.4100e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		370.5199	370.5199	0.0147		370.8286
Total	**0.1103**	**0.1262**	**1.5190**	**5.4100e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**370.5199**	**370.5199**	**0.0147**		**370.8286**

3.6 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609		281.4481	281.4481	0.0159		281.7809
Total	**9.7643**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**		**281.4481**	**281.4481**	**0.0159**		**281.7809**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1049	0.1192	1.4384	5.4000e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		365.4703	365.4703	0.0141		365.7670
Total	**0.1049**	**0.1192**	**1.4384**	**5.4000e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**365.4703**	**365.4703**	**0.0141**		**365.7670**

3.6 Architectural Coating - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609	0.0000	281.4481	281.4481	0.0159		281.7809
Total	**9.7643**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**	**0.0000**	**281.4481**	**281.4481**	**0.0159**		**281.7809**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1049	0.1192	1.4384	5.4000e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		365.4703	365.4703	0.0141		365.7670
Total	**0.1049**	**0.1192**	**1.4384**	**5.4000e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**365.4703**	**365.4703**	**0.0141**		**365.7670**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	14.8343	23.0653	128.4077	0.4247	28.8363	0.4497	29.2859	7.6994	0.4152	8.1146		31,027.3682	31,027.3682	0.9813		31,047.9759
Unmitigated	14.8343	23.0653	128.4077	0.4247	28.8363	0.4497	29.2859	7.6994	0.4152	8.1146		31,027.3682	31,027.3682	0.9813		31,047.9759

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	6,102.32	6,102.32	6102.32	13,622,612	13,622,612
Total	6,102.32	6,102.32	6,102.32	13,622,612	13,622,612

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	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.527459	0.065504	0.176626	0.142970	0.035962	0.004781	0.010016	0.023598	0.001244	0.001463	0.006483	0.001857	0.002036

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.5290	4.5205	1.9236	0.0289		0.3655	0.3655		0.3655	0.3655		5,770.8460	5,770.8460	0.1106	0.1058	5,805.9665
NaturalGas Unmitigated	0.6682	5.7103	2.4299	0.0365		0.4617	0.4617		0.4617	0.4617		7,289.7268	7,289.7268	0.1397	0.1336	7,334.0909

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	61962.7	0.6682	5.7103	2.4299	0.0365		0.4617	0.4617		0.4617	0.4617		7,289.7268	7,289.7268	0.1397	0.1336	7,334.0909
Total		**0.6682**	**5.7103**	**2.4299**	**0.0365**		**0.4617**	**0.4617**		**0.4617**	**0.4617**		**7,289.7268**	**7,289.7268**	**0.1397**	**0.1336**	**7,334.0909**

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	lb/day										lb/day					
Single Family Housing	49.0522	0.5290	4.5205	1.9236	0.0289		0.3655	0.3655		0.3655	0.3655		5,770.8460	5,770.8460	0.1106	0.1058	5,805.9665
Total		**0.5290**	**4.5205**	**1.9236**	**0.0289**		**0.3655**	**0.3655**		**0.3655**	**0.3655**		**5,770.8460**	**5,770.8460**	**0.1106**	**0.1058**	**5,805.9665**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	30.3368	0.6091	52.9403	2.7900e-003		1.2960	1.2960		1.2854	1.2854	0.0000	15,931.6926	15,931.6926	0.3949	0.2903	16,029.9894
Unmitigated	1,179.2406	15.7792	1,443.6678	0.4662		195.0599	195.0599		195.0541	195.0541	20,227.7373	8,805.2809	29,033.0181	16.2446	1.6428	29,883.4069

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	4.4505					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	24.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1,148.5094	15.1701	1,390.8067	0.4634		194.7669	194.7669		194.7611	194.7611	20,227.7373	8,710.0588	28,937.7961	16.1532	1.6428	29,786.2662
Landscaping	1.5894	0.6091	52.8611	2.7900e-003		0.2930	0.2930		0.2930	0.2930		95.2220	95.2220	0.0914		97.1407
Total	**1,179.2406**	**15.7792**	**1,443.6678**	**0.4662**		**195.0599**	**195.0599**		**195.0541**	**195.0541**	**20,227.7373**	**8,805.2808**	**29,033.0181**	**16.2446**	**1.6428**	**29,883.4069**

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	lb/day										lb/day					
Architectural Coating	4.4505					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	22.8452					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.4517	7.0000e-005	0.0792	0.0000		1.0030	1.0030		0.9924	0.9924	0.0000	15,836.4706	15,836.4706	0.3035	0.2903	15,932.8487
Landscaping	1.5894	0.6091	52.8611	2.7900e-003		0.2930	0.2930		0.2930	0.2930		95.2220	95.2220	0.0914		97.1407
Total	**30.3368**	**0.6091**	**52.9403**	**2.7900e-003**		**1.2960**	**1.2960**		**1.2854**	**1.2854**	**0.0000**	**15,931.6926**	**15,931.6926**	**0.3949**	**0.2903**	**16,029.9894**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Vegetation

Vineyards at Sand Creek

Contra Costa County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	641.00	Dwelling Unit	141.00	1,153,800.00	1833

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - based on project description and traffic report assumptions

Construction Phase - based on information provided by the applicant

Grading - based on information from applicant

Architectural Coating -

Vehicle Trips - based on traffic report

Area Mitigation -

Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	220.00	1,695.00
tblConstructionPhase	NumDays	3,100.00	1,695.00
tblConstructionPhase	NumDays	310.00	130.00
tblConstructionPhase	NumDays	220.00	15.00
tblConstructionPhase	NumDays	120.00	45.00
tblConstructionPhase	PhaseEndDate	12/20/2030	7/5/2024
tblConstructionPhase	PhaseStartDate	6/22/2024	1/8/2018
tblConstructionPhase	PhaseStartDate	12/23/2017	12/25/2017
tblConstructionPhase	PhaseStartDate	6/3/2017	6/5/2017
tblConstructionPhase	PhaseStartDate	12/2/2017	12/4/2017
tblGrading	AcresOfGrading	325.00	141.00
tblLandUse	LotAcreage	208.12	141.00
tblProjectCharacteristics	OperationalYear	2014	2024
tblVehicleTrips	ST_TR	10.08	9.52
tblVehicleTrips	SU_TR	8.77	9.52
tblVehicleTrips	WD_TR	9.57	9.52

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	6.1700	69.7011	47.8026	0.0678	18.2360	3.3186	20.9915	9.9757	3.0531	12.5108	0.0000	6,485.5868	6,485.5868	1.9436	0.0000	6,526.4018
2018	14.2161	32.3158	42.7778	0.0756	3.0699	1.7460	4.8159	0.8234	1.6485	2.4719	0.0000	6,764.0859	6,764.0859	0.7947	0.0000	6,780.7737
2019	13.7259	29.2311	40.7482	0.0755	3.0698	1.5088	4.5786	0.8233	1.4245	2.2479	0.0000	6,624.7246	6,624.7246	0.7724	0.0000	6,640.9447
2020	13.3509	26.3393	39.1602	0.0755	3.0697	1.3105	4.3802	0.8233	1.2373	2.0606	0.0000	6,461.6488	6,461.6488	0.7550	0.0000	6,477.5043
2021	13.0230	23.5791	37.8277	0.0755	3.0698	1.1289	4.1987	0.8233	1.0656	1.8889	0.0000	6,422.6872	6,422.6872	0.7406	0.0000	6,438.2395
2022	12.7543	21.1687	36.6245	0.0755	3.0700	0.9664	4.0363	0.8234	0.9126	1.7360	0.0000	6,388.5862	6,388.5862	0.7313	0.0000	6,403.9444
2023	12.5386	19.2740	35.6730	0.0754	3.0701	0.8449	3.9150	0.8234	0.7978	1.6212	0.0000	6,354.6298	6,354.6298	0.7210	0.0000	6,369.7698
2024	12.3724	18.1732	34.8033	0.0754	3.0702	0.7492	3.8194	0.8235	0.7069	1.5304	0.0000	6,327.8833	6,327.8833	0.7131	0.0000	6,342.8577
Total	**98.1512**	**239.7822**	**315.4173**	**0.5961**	**39.7254**	**11.5733**	**50.7355**	**15.7393**	**10.8464**	**26.0676**	**0.0000**	**51,829.8324**	**51,829.8324**	**7.1716**	**0.0000**	**51,980.4359**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	6.1700	69.7011	47.8026	0.0678	18.2360	3.3186	20.9915	9.9757	3.0531	12.5108	0.0000	6,485.5868	6,485.5868	1.9436	0.0000	6,526.4018
2018	14.2161	32.3158	42.7778	0.0756	3.0699	1.7460	4.8159	0.8234	1.6485	2.4719	0.0000	6,764.0859	6,764.0859	0.7947	0.0000	6,780.7737
2019	13.7259	29.2311	40.7482	0.0755	3.0698	1.5088	4.5786	0.8233	1.4245	2.2479	0.0000	6,624.7246	6,624.7246	0.7724	0.0000	6,640.9447
2020	13.3509	26.3393	39.1602	0.0755	3.0697	1.3105	4.3802	0.8233	1.2373	2.0606	0.0000	6,461.6488	6,461.6488	0.7550	0.0000	6,477.5043
2021	13.0230	23.5791	37.8277	0.0755	3.0698	1.1289	4.1987	0.8233	1.0656	1.8889	0.0000	6,422.6872	6,422.6872	0.7406	0.0000	6,438.2395
2022	12.7543	21.1687	36.6245	0.0755	3.0700	0.9664	4.0363	0.8234	0.9126	1.7360	0.0000	6,388.5862	6,388.5862	0.7313	0.0000	6,403.9444
2023	12.5386	19.2740	35.6730	0.0754	3.0701	0.8449	3.9150	0.8234	0.7978	1.6212	0.0000	6,354.6298	6,354.6298	0.7210	0.0000	6,369.7698
2024	12.3724	18.1732	34.8033	0.0754	3.0702	0.7492	3.8194	0.8235	0.7069	1.5304	0.0000	6,327.8832	6,327.8832	0.7131	0.0000	6,342.8577
Total	**98.1512**	**239.7822**	**315.4173**	**0.5961**	**39.7254**	**11.5733**	**50.7355**	**15.7393**	**10.8464**	**26.0676**	**0.0000**	**51,829.8324**	**51,829.8324**	**7.1716**	**0.0000**	**51,980.4359**

	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**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1,179.2406	15.7792	1,443.6678	0.4662		195.0599	195.0599		195.0541	195.0541	20,227.7373	8,805.2809	29,033.0181	16.2446	1.6428	29,883.4069
Energy	0.6682	5.7103	2.4299	0.0365		0.4617	0.4617		0.4617	0.4617		7,289.7268	7,289.7268	0.1397	0.1336	7,334.0909
Mobile	14.6283	25.8570	146.1227	0.3925	28.8363	0.4513	29.2876	7.6994	0.4167	8.1161		28,789.1641	28,789.1641	0.9828		28,809.8026
Total	**1,194.5371**	**47.3464**	**1,592.2204**	**0.8951**	**28.8363**	**195.9728**	**224.8091**	**7.6994**	**195.9325**	**203.6318**	**20,227.7373**	**44,884.1717**	**65,111.9090**	**17.3671**	**1.7764**	**66,027.3003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	30.3368	0.6091	52.9403	2.7900e-003		1.2960	1.2960		1.2854	1.2854	0.0000	15,931.6926	15,931.6926	0.3949	0.2903	16,029.9894
Energy	0.5290	4.5205	1.9236	0.0289		0.3655	0.3655		0.3655	0.3655		5,770.8460	5,770.8460	0.1106	0.1058	5,805.9665
Mobile	14.6283	25.8570	146.1227	0.3925	28.8363	0.4513	29.2876	7.6994	0.4167	8.1161		28,789.1641	28,789.1641	0.9828		28,809.8026
Total	**45.4940**	**30.9866**	**200.9866**	**0.4241**	**28.8363**	**2.1127**	**30.9490**	**7.6994**	**2.0676**	**9.7670**	**0.0000**	**50,491.7027**	**50,491.7027**	**1.4883**	**0.3961**	**50,645.7584**

	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	**96.19**	**34.55**	**87.38**	**52.62**	**0.00**	**98.92**	**86.23**	**0.00**	**98.94**	**95.20**	**100.00**	**-12.49**	**22.45**	**91.43**	**77.70**	**23.30**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/3/2017	6/2/2017	5	45	
2	Grading	Grading	6/5/2017	12/1/2017	5	130	
3	Paving	Paving	12/4/2017	12/22/2017	5	15	
4	Building Construction	Building Construction	12/25/2017	6/21/2024	5	1695	
5	Architectural Coating	Architectural Coating	1/8/2018	7/5/2024	5	1695	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 141

Acres of Paving: 0

Residential Indoor: 2,336,445; Residential Outdoor: 778,815; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Excavators	2	8.00	162	0.38
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	125	0.42
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	130	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Building Construction	Welders	1	8.00	46	0.45

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
Site Preparation	7	18.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	231.00	69.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	46.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.8382	51.7535	39.3970	0.0391		2.7542	2.7542		2.5339	2.5339		4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**4.8382**	**51.7535**	**39.3970**	**0.0391**	**18.0663**	**2.7542**	**20.8205**	**9.9307**	**2.5339**	**12.4646**		**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0638	0.0982	0.8978	1.9200e-003	0.1698	1.2700e-003	0.1710	0.0450	1.1700e-003	0.0462		154.9960	154.9960	8.2500e-003		155.1693
Total	**0.0638**	**0.0982**	**0.8978**	**1.9200e-003**	**0.1698**	**1.2700e-003**	**0.1710**	**0.0450**	**1.1700e-003**	**0.0462**		**154.9960**	**154.9960**	**8.2500e-003**		**155.1693**

3.2 Site Preparation - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.8382	51.7535	39.3970	0.0391		2.7542	2.7542		2.5339	2.5339	0.0000	4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**4.8382**	**51.7535**	**39.3970**	**0.0391**	**18.0663**	**2.7542**	**20.8205**	**9.9307**	**2.5339**	**12.4646**	**0.0000**	**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0638	0.0982	0.8978	1.9200e-003	0.1698	1.2700e-003	0.1710	0.0450	1.1700e-003	0.0462		154.9960	154.9960	8.2500e-003		155.1693
Total	**0.0638**	**0.0982**	**0.8978**	**1.9200e-003**	**0.1698**	**1.2700e-003**	**0.1710**	**0.0450**	**1.1700e-003**	**0.0462**		**154.9960**	**154.9960**	**8.2500e-003**		**155.1693**

3.3 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1723	0.0000	7.1723	3.4344	0.0000	3.4344			0.0000			0.0000
Off-Road	6.0991	69.5920	46.8050	0.0617		3.3172	3.3172		3.0518	3.0518		6,313.3690	6,313.3690	1.9344		6,353.9915
Total	**6.0991**	**69.5920**	**46.8050**	**0.0617**	**7.1723**	**3.3172**	**10.4895**	**3.4344**	**3.0518**	**6.4862**		**6,313.3690**	**6,313.3690**	**1.9344**		**6,353.9915**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0709	0.1091	0.9976	2.1300e-003	0.1886	1.4100e-003	0.1900	0.0500	1.3000e-003	0.0513		172.2178	172.2178	9.1700e-003		172.4103
Total	**0.0709**	**0.1091**	**0.9976**	**2.1300e-003**	**0.1886**	**1.4100e-003**	**0.1900**	**0.0500**	**1.3000e-003**	**0.0513**		**172.2178**	**172.2178**	**9.1700e-003**		**172.4103**

3.3 Grading - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1723	0.0000	7.1723	3.4344	0.0000	3.4344			0.0000			0.0000
Off-Road	6.0991	69.5920	46.8050	0.0617		3.3172	3.3172		3.0518	3.0518	0.0000	6,313.3690	6,313.3690	1.9344		6,353.9915
Total	**6.0991**	**69.5920**	**46.8050**	**0.0617**	**7.1723**	**3.3172**	**10.4895**	**3.4344**	**3.0518**	**6.4862**	**0.0000**	**6,313.3690**	**6,313.3690**	**1.9344**		**6,353.9915**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0709	0.1091	0.9976	2.1300e-003	0.1886	1.4100e-003	0.1900	0.0500	1.3000e-003	0.0513		172.2178	172.2178	9.1700e-003		172.4103
Total	**0.0709**	**0.1091**	**0.9976**	**2.1300e-003**	**0.1886**	**1.4100e-003**	**0.1900**	**0.0500**	**1.3000e-003**	**0.0513**		**172.2178**	**172.2178**	**9.1700e-003**		**172.4103**

3.4 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9074	20.2964	14.7270	0.0223		1.1384	1.1384		1.0473	1.0473		2,281.0588	2,281.0588	0.6989		2,295.7360
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9074**	**20.2964**	**14.7270**	**0.0223**		**1.1384**	**1.1384**		**1.0473**	**1.0473**		**2,281.0588**	**2,281.0588**	**0.6989**		**2,295.7360**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0532	0.0818	0.7482	1.6000e-003	0.1415	1.0600e-003	0.1425	0.0375	9.8000e-004	0.0385		129.1633	129.1633	6.8800e-003		129.3077
Total	**0.0532**	**0.0818**	**0.7482**	**1.6000e-003**	**0.1415**	**1.0600e-003**	**0.1425**	**0.0375**	**9.8000e-004**	**0.0385**		**129.1633**	**129.1633**	**6.8800e-003**		**129.3077**

3.4 Paving - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9074	20.2964	14.7270	0.0223		1.1384	1.1384		1.0473	1.0473	0.0000	2,281.0588	2,281.0588	0.6989		2,295.7360
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9074**	**20.2964**	**14.7270**	**0.0223**		**1.1384**	**1.1384**		**1.0473**	**1.0473**	**0.0000**	**2,281.0588**	**2,281.0588**	**0.6989**		**2,295.7360**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0532	0.0818	0.7482	1.6000e-003	0.1415	1.0600e-003	0.1425	0.0375	9.8000e-004	0.0385		129.1633	129.1633	6.8800e-003		129.3077
Total	**0.0532**	**0.0818**	**0.7482**	**1.6000e-003**	**0.1415**	**1.0600e-003**	**0.1425**	**0.0375**	**9.8000e-004**	**0.0385**		**129.1633**	**129.1633**	**6.8800e-003**		**129.3077**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730		2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**3.1024**	**26.4057**	**18.1291**	**0.0268**		**1.7812**	**1.7812**		**1.6730**	**1.6730**		**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.9059	6.2771	11.7873	0.0163	0.4578	0.0888	0.5466	0.1306	0.0817	0.2122		1,604.6151	1,604.6151	0.0126		1,604.8806
Worker	0.8185	1.2603	11.5223	0.0246	2.1784	0.0163	2.1947	0.5778	0.0150	0.5928		1,989.1153	1,989.1153	0.1059		1,991.3391
Total	**1.7244**	**7.5374**	**23.3097**	**0.0410**	**2.6362**	**0.1052**	**2.7413**	**0.7083**	**0.0967**	**0.8050**		**3,593.7304**	**3,593.7304**	**0.1185**		**3,596.2197**

3.5 Building Construction - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730	0.0000	2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**3.1024**	**26.4057**	**18.1291**	**0.0268**		**1.7812**	**1.7812**		**1.6730**	**1.6730**	**0.0000**	**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.9059	6.2771	11.7873	0.0163	0.4578	0.0888	0.5466	0.1306	0.0817	0.2122		1,604.6151	1,604.6151	0.0126		1,604.8806
Worker	0.8185	1.2603	11.5223	0.0246	2.1784	0.0163	2.1947	0.5778	0.0150	0.5928		1,989.1153	1,989.1153	0.1059		1,991.3391
Total	**1.7244**	**7.5374**	**23.3097**	**0.0410**	**2.6362**	**0.1052**	**2.7413**	**0.7083**	**0.0967**	**0.8050**		**3,593.7304**	**3,593.7304**	**0.1185**		**3,596.2197**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6687	23.2608	17.5327	0.0268		1.4943	1.4943		1.4048	1.4048		2,609.9390	2,609.9390	0.6387		2,623.3517
Total	**2.6687**	**23.2608**	**17.5327**	**0.0268**		**1.4943**	**1.4943**		**1.4048**	**1.4048**		**2,609.9390**	**2,609.9390**	**0.6387**		**2,623.3517**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.7935	5.6873	11.0846	0.0163	0.4577	0.0823	0.5399	0.1305	0.0757	0.2062		1,576.3062	1,576.3062	0.0124		1,576.5672
Worker	0.7270	1.1358	10.2627	0.0246	2.1784	0.0158	2.1942	0.5778	0.0146	0.5924		1,915.0418	1,915.0418	0.0974		1,917.0871
Total	**1.5205**	**6.8230**	**21.3473**	**0.0409**	**2.6361**	**0.0981**	**2.7341**	**0.7083**	**0.0903**	**0.7986**		**3,491.3480**	**3,491.3480**	**0.1098**		**3,493.6542**

3.5 Building Construction - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6687	23.2608	17.5327	0.0268		1.4943	1.4943		1.4048	1.4048	0.0000	2,609.9389	2,609.9389	0.6387		2,623.3517
Total	**2.6687**	**23.2608**	**17.5327**	**0.0268**		**1.4943**	**1.4943**		**1.4048**	**1.4048**	**0.0000**	**2,609.9389**	**2,609.9389**	**0.6387**		**2,623.3517**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.7935	5.6873	11.0846	0.0163	0.4577	0.0823	0.5399	0.1305	0.0757	0.2062		1,576.3062	1,576.3062	0.0124		1,576.5672
Worker	0.7270	1.1358	10.2627	0.0246	2.1784	0.0158	2.1942	0.5778	0.0146	0.5924		1,915.0418	1,915.0418	0.0974		1,917.0871
Total	**1.5205**	**6.8230**	**21.3473**	**0.0409**	**2.6361**	**0.0981**	**2.7341**	**0.7083**	**0.0903**	**0.7986**		**3,491.3480**	**3,491.3480**	**0.1098**		**3,493.6542**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3516	20.9650	17.1204	0.0268		1.2850	1.2850		1.2083	1.2083		2,580.7618	2,580.7618	0.6279		2,593.9479
Total	**2.3516**	**20.9650**	**17.1204**	**0.0268**		**1.2850**	**1.2850**		**1.2083**	**1.2083**		**2,580.7618**	**2,580.7618**	**0.6279**		**2,593.9479**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.7341	5.1902	10.6657	0.0163	0.4576	0.0765	0.5340	0.1305	0.0703	0.2008		1,549.0149	1,549.0149	0.0122		1,549.2700
Worker	0.6590	1.0345	9.2741	0.0246	2.1784	0.0155	2.1939	0.5778	0.0143	0.5921		1,845.9150	1,845.9150	0.0905		1,847.8162
Total	**1.3930**	**6.2246**	**19.9398**	**0.0409**	**2.6360**	**0.0919**	**2.7279**	**0.7083**	**0.0847**	**0.7929**		**3,394.9299**	**3,394.9299**	**0.1027**		**3,397.0861**

3.5 Building Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3516	20.9650	17.1204	0.0268		1.2850	1.2850		1.2083	1.2083	0.0000	2,580.7618	2,580.7618	0.6279		2,593.9479
Total	**2.3516**	**20.9650**	**17.1204**	**0.0268**		**1.2850**	**1.2850**		**1.2083**	**1.2083**	**0.0000**	**2,580.7618**	**2,580.7618**	**0.6279**		**2,593.9479**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.7341	5.1902	10.6657	0.0163	0.4576	0.0765	0.5340	0.1305	0.0703	0.2008		1,549.0149	1,549.0149	0.0122		1,549.2700
Worker	0.6590	1.0345	9.2741	0.0246	2.1784	0.0155	2.1939	0.5778	0.0143	0.5921		1,845.9150	1,845.9150	0.0905		1,847.8162
Total	**1.3930**	**6.2246**	**19.9398**	**0.0409**	**2.6360**	**0.0919**	**2.7279**	**0.7083**	**0.0847**	**0.7929**		**3,394.9299**	**3,394.9299**	**0.1027**		**3,397.0861**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1113	19.0839	16.8084	0.0268		1.1128	1.1128		1.0465	1.0465		2,542.4799	2,542.4799	0.6194		2,555.4880
Total	**2.1113**	**19.0839**	**16.8084**	**0.0268**		**1.1128**	**1.1128**		**1.0465**	**1.0465**		**2,542.4799**	**2,542.4799**	**0.6194**		**2,555.4880**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6829	4.4309	10.3225	0.0162	0.4575	0.0684	0.5260	0.1305	0.0630	0.1934		1,513.4913	1,513.4913	0.0118		1,513.7391
Worker	0.6096	0.9512	8.5043	0.0246	2.1784	0.0153	2.1937	0.5778	0.0142	0.5919		1,771.4694	1,771.4694	0.0851		1,773.2557
Total	**1.2925**	**5.3821**	**18.8268**	**0.0408**	**2.6359**	**0.0837**	**2.7196**	**0.7082**	**0.0771**	**0.7853**		**3,284.9607**	**3,284.9607**	**0.0969**		**3,286.9948**

3.5 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1113	19.0839	16.8084	0.0268		1.1128	1.1128		1.0465	1.0465	0.0000	2,542.4799	2,542.4799	0.6194		2,555.4880
Total	**2.1113**	**19.0839**	**16.8084**	**0.0268**		**1.1128**	**1.1128**		**1.0465**	**1.0465**	**0.0000**	**2,542.4799**	**2,542.4799**	**0.6194**		**2,555.4880**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6829	4.4309	10.3225	0.0162	0.4575	0.0684	0.5260	0.1305	0.0630	0.1934		1,513.4913	1,513.4913	0.0118		1,513.7391
Worker	0.6096	0.9512	8.5043	0.0246	2.1784	0.0153	2.1937	0.5778	0.0142	0.5919		1,771.4694	1,771.4694	0.0851		1,773.2557
Total	**1.2925**	**5.3821**	**18.8268**	**0.0408**	**2.6359**	**0.0837**	**2.7196**	**0.7082**	**0.0771**	**0.7853**		**3,284.9607**	**3,284.9607**	**0.0969**		**3,286.9948**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8931	17.3403	16.5376	0.0268		0.9549	0.9549		0.8979	0.8979		2,542.7817	2,542.7817	0.6126		2,555.6462
Total	**1.8931**	**17.3403**	**16.5376**	**0.0268**		**0.9549**	**0.9549**		**0.8979**	**0.8979**		**2,542.7817**	**2,542.7817**	**0.6126**		**2,555.6462**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6373	3.6489	9.9557	0.0162	0.4576	0.0617	0.5193	0.1305	0.0567	0.1872		1,511.5609	1,511.5609	0.0118		1,511.8087
Worker	0.5755	0.8865	7.9363	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,740.3361	1,740.3361	0.0808		1,742.0327
Total	**1.2128**	**4.5354**	**17.8921**	**0.0408**	**2.6360**	**0.0769**	**2.7129**	**0.7083**	**0.0708**	**0.7791**		**3,251.8969**	**3,251.8969**	**0.0926**		**3,253.8414**

3.5 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8931	17.3403	16.5376	0.0268		0.9549	0.9549		0.8979	0.8979	0.0000	2,542.7817	2,542.7817	0.6126		2,555.6462
Total	**1.8931**	**17.3403**	**16.5376**	**0.0268**		**0.9549**	**0.9549**		**0.8979**	**0.8979**	**0.0000**	**2,542.7817**	**2,542.7817**	**0.6126**		**2,555.6462**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6373	3.6489	9.9557	0.0162	0.4576	0.0617	0.5193	0.1305	0.0567	0.1872		1,511.5609	1,511.5609	0.0118		1,511.8087
Worker	0.5755	0.8865	7.9363	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,740.3361	1,740.3361	0.0808		1,742.0327
Total	**1.2128**	**4.5354**	**17.8921**	**0.0408**	**2.6360**	**0.0769**	**2.7129**	**0.7083**	**0.0708**	**0.7791**		**3,251.8969**	**3,251.8969**	**0.0926**		**3,253.8414**

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	lb/day										lb/day					
Off-Road	1.6992	15.5364	16.3276	0.0268		0.8057	0.8057		0.7581	0.7581		2,543.7497	2,543.7497	0.6085		2,556.5286
Total	**1.6992**	**15.5364**	**16.3276**	**0.0268**		**0.8057**	**0.8057**		**0.7581**	**0.7581**		**2,543.7497**	**2,543.7497**	**0.6085**		**2,556.5286**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6134	3.2285	9.5744	0.0162	0.4578	0.0607	0.5185	0.1306	0.0559	0.1864		1,510.5177	1,510.5177	0.0121		1,510.7710
Worker	0.5451	0.8300	7.4295	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,711.9609	1,711.9609	0.0771		1,713.5796
Total	**1.1585**	**4.0585**	**17.0039**	**0.0408**	**2.6362**	**0.0759**	**2.7121**	**0.7083**	**0.0700**	**0.7783**		**3,222.4786**	**3,222.4786**	**0.0891**		**3,224.3506**

3.5 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6992	15.5364	16.3276	0.0268		0.8057	0.8057		0.7581	0.7581	0.0000	2,543.7497	2,543.7497	0.6085		2,556.5286
Total	**1.6992**	**15.5364**	**16.3276**	**0.0268**		**0.8057**	**0.8057**		**0.7581**	**0.7581**	**0.0000**	**2,543.7497**	**2,543.7497**	**0.6085**		**2,556.5286**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6134	3.2285	9.5744	0.0162	0.4578	0.0607	0.5185	0.1306	0.0559	0.1864		1,510.5177	1,510.5177	0.0121		1,510.7710
Worker	0.5451	0.8300	7.4295	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,711.9609	1,711.9609	0.0771		1,713.5796
Total	**1.1585**	**4.0585**	**17.0039**	**0.0408**	**2.6362**	**0.0759**	**2.7121**	**0.7083**	**0.0700**	**0.7783**		**3,222.4786**	**3,222.4786**	**0.0891**		**3,224.3506**

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	lb/day										lb/day					
Off-Road	1.5661	14.3126	16.2093	0.0268		0.6967	0.6967		0.6557	0.6557		2,544.6262	2,544.6262	0.6044		2,557.3191
Total	**1.5661**	**14.3126**	**16.2093**	**0.0268**		**0.6967**	**0.6967**		**0.6557**	**0.6557**		**2,544.6262**	**2,544.6262**	**0.6044**		**2,557.3191**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5774	2.7231	9.2943	0.0161	0.4579	0.0592	0.5171	0.1306	0.0545	0.1851		1,506.5473	1,506.5473	0.0112		1,506.7819
Worker	0.5170	0.7800	6.9704	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,686.2234	1,686.2234	0.0738		1,687.7737
Total	**1.0943**	**3.5031**	**16.2646**	**0.0407**	**2.6363**	**0.0744**	**2.7106**	**0.7084**	**0.0685**	**0.7769**		**3,192.7708**	**3,192.7708**	**0.0850**		**3,194.5556**

3.5 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5661	14.3126	16.2093	0.0268		0.6967	0.6967		0.6557	0.6557	0.0000	2,544.6262	2,544.6262	0.6044		2,557.3191
Total	**1.5661**	**14.3126**	**16.2093**	**0.0268**		**0.6967**	**0.6967**		**0.6557**	**0.6557**	**0.0000**	**2,544.6262**	**2,544.6262**	**0.6044**		**2,557.3191**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5774	2.7231	9.2943	0.0161	0.4579	0.0592	0.5171	0.1306	0.0545	0.1851		1,506.5473	1,506.5473	0.0112		1,506.7819
Worker	0.5170	0.7800	6.9704	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,686.2234	1,686.2234	0.0738		1,687.7737
Total	**1.0943**	**3.5031**	**16.2646**	**0.0407**	**2.6363**	**0.0744**	**2.7106**	**0.7084**	**0.0685**	**0.7769**		**3,192.7708**	**3,192.7708**	**0.0850**		**3,194.5556**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4653	13.3774	16.1332	0.0268		0.6106	0.6106		0.5744	0.5744		2,545.1154	2,545.1154	0.6009		2,557.7349
Total	**1.4653**	**13.3774**	**16.1332**	**0.0268**		**0.6106**	**0.6106**		**0.5744**	**0.5744**		**2,545.1154**	**2,545.1154**	**0.6009**		**2,557.7349**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5537	2.6945	8.9706	0.0161	0.4580	0.0595	0.5175	0.1307	0.0548	0.1854		1,507.0894	1,507.0894	0.0112		1,507.3249
Worker	0.4913	0.7359	6.5792	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,663.0585	1,663.0585	0.0710		1,664.5485
Total	**1.0450**	**3.4304**	**15.5498**	**0.0407**	**2.6364**	**0.0747**	**2.7111**	**0.7084**	**0.0688**	**0.7773**		**3,170.1479**	**3,170.1479**	**0.0822**		**3,171.8734**

3.5 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4653	13.3774	16.1332	0.0268		0.6106	0.6106		0.5744	0.5744	0.0000	2,545.1154	2,545.1154	0.6009		2,557.7349
Total	**1.4653**	**13.3774**	**16.1332**	**0.0268**		**0.6106**	**0.6106**		**0.5744**	**0.5744**	**0.0000**	**2,545.1154**	**2,545.1154**	**0.6009**		**2,557.7349**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5537	2.6945	8.9706	0.0161	0.4580	0.0595	0.5175	0.1307	0.0548	0.1854		1,507.0894	1,507.0894	0.0112		1,507.3249
Worker	0.4913	0.7359	6.5792	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,663.0585	1,663.0585	0.0710		1,664.5485
Total	**1.0450**	**3.4304**	**15.5498**	**0.0407**	**2.6364**	**0.0747**	**2.7111**	**0.7084**	**0.0688**	**0.7773**		**3,170.1479**	**3,170.1479**	**0.0822**		**3,171.8734**

3.6 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.0102
Total	**9.8822**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.0102**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1448	0.2262	2.0437	4.9000e-003	0.4338	3.1400e-003	0.4369	0.1151	2.9100e-003	0.1180		381.3503	381.3503	0.0194		381.7576
Total	**0.1448**	**0.2262**	**2.0437**	**4.9000e-003**	**0.4338**	**3.1400e-003**	**0.4369**	**0.1151**	**2.9100e-003**	**0.1180**		**381.3503**	**381.3503**	**0.0194**		**381.7576**

3.6 Architectural Coating - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506	0.0000	281.4485	281.4485	0.0267		282.0102
Total	**9.8822**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.0102**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1448	0.2262	2.0437	4.9000e-003	0.4338	3.1400e-003	0.4369	0.1151	2.9100e-003	0.1180		381.3503	381.3503	0.0194		381.7576
Total	**0.1448**	**0.2262**	**2.0437**	**4.9000e-003**	**0.4338**	**3.1400e-003**	**0.4369**	**0.1151**	**2.9100e-003**	**0.1180**		**381.3503**	**381.3503**	**0.0194**		**381.7576**

3.6 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		281.9473
Total	**9.8500**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**281.9473**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1312	0.2060	1.8468	4.9000e-003	0.4338	3.0800e-003	0.4369	0.1151	2.8500e-003	0.1179		367.5848	367.5848	0.0180		367.9634
Total	**0.1312**	**0.2060**	**1.8468**	**4.9000e-003**	**0.4338**	**3.0800e-003**	**0.4369**	**0.1151**	**2.8500e-003**	**0.1179**		**367.5848**	**367.5848**	**0.0180**		**367.9634**

3.6 Architectural Coating - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		281.9473
Total	**9.8500**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**281.9473**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1312	0.2060	1.8468	4.9000e-003	0.4338	3.0800e-003	0.4369	0.1151	2.8500e-003	0.1179		367.5848	367.5848	0.0180		367.9634
Total	**0.1312**	**0.2060**	**1.8468**	**4.9000e-003**	**0.4338**	**3.0800e-003**	**0.4369**	**0.1151**	**2.8500e-003**	**0.1179**		**367.5848**	**367.5848**	**0.0180**		**367.9634**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9057
Total	**9.8257**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9057**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1214	0.1894	1.6935	4.9000e-003	0.4338	3.0400e-003	0.4368	0.1151	2.8200e-003	0.1179		352.7602	352.7602	0.0169		353.1159
Total	**0.1214**	**0.1894**	**1.6935**	**4.9000e-003**	**0.4338**	**3.0400e-003**	**0.4368**	**0.1151**	**2.8200e-003**	**0.1179**		**352.7602**	**352.7602**	**0.0169**		**353.1159**

3.6 Architectural Coating - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9057
Total	**9.8257**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9057**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1214	0.1894	1.6935	4.9000e-003	0.4338	3.0400e-003	0.4368	0.1151	2.8200e-003	0.1179		352.7602	352.7602	0.0169		353.1159
Total	**0.1214**	**0.1894**	**1.6935**	**4.9000e-003**	**0.4338**	**3.0400e-003**	**0.4368**	**0.1151**	**2.8200e-003**	**0.1179**		**352.7602**	**352.7602**	**0.0169**		**353.1159**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.8537
Total	**9.8025**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.8537**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1146	0.1765	1.5804	4.9000e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		346.5604	346.5604	0.0161		346.8983
Total	**0.1146**	**0.1765**	**1.5804**	**4.9000e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**346.5604**	**346.5604**	**0.0161**		**346.8983**

3.6 Architectural Coating - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.8537
Total	**9.8025**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.8537**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1146	0.1765	1.5804	4.9000e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		346.5604	346.5604	0.0161		346.8983
Total	**0.1146**	**0.1765**	**1.5804**	**4.9000e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**346.5604**	**346.5604**	**0.0161**		**346.8983**

3.6 Architectural Coating - 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	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.8329
Total	**9.7881**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.8329**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1086	0.1653	1.4795	4.9000e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		340.9100	340.9100	0.0154		341.2323
Total	**0.1086**	**0.1653**	**1.4795**	**4.9000e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**340.9100**	**340.9100**	**0.0154**		**341.2323**

3.6 Architectural Coating - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.8329
Total	**9.7881**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.8329**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1086	0.1653	1.4795	4.9000e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		340.9100	340.9100	0.0154		341.2323
Total	**0.1086**	**0.1653**	**1.4795**	**4.9000e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**340.9100**	**340.9100**	**0.0154**		**341.2323**

3.6 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	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8017
Total	**9.7752**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8017**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1030	0.1553	1.3880	4.9000e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		335.7848	335.7848	0.0147		336.0935
Total	**0.1030**	**0.1553**	**1.3880**	**4.9000e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**335.7848**	**335.7848**	**0.0147**		**336.0935**

3.6 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8017
Total	**9.7752**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8017**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1030	0.1553	1.3880	4.9000e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		335.7848	335.7848	0.0147		336.0935
Total	**0.1030**	**0.1553**	**1.3880**	**4.9000e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**335.7848**	**335.7848**	**0.0147**		**336.0935**

3.6 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609		281.4481	281.4481	0.0159		281.7809
Total	**9.7643**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**		**281.4481**	**281.4481**	**0.0159**		**281.7809**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0978	0.1465	1.3101	4.8900e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		331.1718	331.1718	0.0141		331.4685
Total	**0.0978**	**0.1465**	**1.3101**	**4.8900e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**331.1718**	**331.1718**	**0.0141**		**331.4685**

3.6 Architectural Coating - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609	0.0000	281.4481	281.4481	0.0159		281.7809
Total	**9.7643**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**	**0.0000**	**281.4481**	**281.4481**	**0.0159**		**281.7809**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0978	0.1465	1.3101	4.8900e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		331.1718	331.1718	0.0141		331.4685
Total	**0.0978**	**0.1465**	**1.3101**	**4.8900e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**331.1718**	**331.1718**	**0.0141**		**331.4685**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	14.6283	25.8570	146.1227	0.3925	28.8363	0.4513	29.2876	7.6994	0.4167	8.1161		28,789.1641	28,789.1641	0.9828		28,809.8026
Unmitigated	14.6283	25.8570	146.1227	0.3925	28.8363	0.4513	29.2876	7.6994	0.4167	8.1161		28,789.1641	28,789.1641	0.9828		28,809.8026

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	6,102.32	6,102.32	6102.32	13,622,612	13,622,612
Total	6,102.32	6,102.32	6,102.32	13,622,612	13,622,612

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	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.527459	0.065504	0.176626	0.142970	0.035962	0.004781	0.010016	0.023598	0.001244	0.001463	0.006483	0.001857	0.002036

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.5290	4.5205	1.9236	0.0289		0.3655	0.3655		0.3655	0.3655		5,770.8460	5,770.8460	0.1106	0.1058	5,805.9665
NaturalGas Unmitigated	0.6682	5.7103	2.4299	0.0365		0.4617	0.4617		0.4617	0.4617		7,289.7268	7,289.7268	0.1397	0.1336	7,334.0909

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	61962.7	0.6682	5.7103	2.4299	0.0365		0.4617	0.4617		0.4617	0.4617		7,289.7268	7,289.7268	0.1397	0.1336	7,334.0909
Total		**0.6682**	**5.7103**	**2.4299**	**0.0365**		**0.4617**	**0.4617**		**0.4617**	**0.4617**		**7,289.7268**	**7,289.7268**	**0.1397**	**0.1336**	**7,334.0909**

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	lb/day										lb/day					
Single Family Housing	49.0522	0.5290	4.5205	1.9236	0.0289		0.3655	0.3655		0.3655	0.3655		5,770.8460	5,770.8460	0.1106	0.1058	5,805.9665
Total		**0.5290**	**4.5205**	**1.9236**	**0.0289**		**0.3655**	**0.3655**		**0.3655**	**0.3655**		**5,770.8460**	**5,770.8460**	**0.1106**	**0.1058**	**5,805.9665**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	30.3368	0.6091	52.9403	2.7900e-003		1.2960	1.2960		1.2854	1.2854	0.0000	15,931.6926	15,931.6926	0.3949	0.2903	16,029.9894
Unmitigated	1,179.2406	15.7792	1,443.6678	0.4662		195.0599	195.0599		195.0541	195.0541	20,227.7373	8,805.2809	29,033.0181	16.2446	1.6428	29,883.4069

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	4.4505					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	24.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1,148.5094	15.1701	1,390.8067	0.4634		194.7669	194.7669		194.7611	194.7611	20,227.7373	8,710.0588	28,937.7961	16.1532	1.6428	29,786.2662
Landscaping	1.5894	0.6091	52.8611	2.7900e-003		0.2930	0.2930		0.2930	0.2930		95.2220	95.2220	0.0914		97.1407
Total	**1,179.2406**	**15.7792**	**1,443.6678**	**0.4662**		**195.0599**	**195.0599**		**195.0541**	**195.0541**	**20,227.7373**	**8,805.2808**	**29,033.0181**	**16.2446**	**1.6428**	**29,883.4069**

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	lb/day										lb/day					
Architectural Coating	4.4505					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	22.8452					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.4517	7.0000e-005	0.0792	0.0000		1.0030	1.0030		0.9924	0.9924	0.0000	15,836.4706	15,836.4706	0.3035	0.2903	15,932.8487
Landscaping	1.5894	0.6091	52.8611	2.7900e-003		0.2930	0.2930		0.2930	0.2930		95.2220	95.2220	0.0914		97.1407
Total	**30.3368**	**0.6091**	**52.9403**	**2.7900e-003**		**1.2960**	**1.2960**		**1.2854**	**1.2854**	**0.0000**	**15,931.6926**	**15,931.6926**	**0.3949**	**0.2903**	**16,029.9894**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Vegetation

Vineyards at Sand Creek (MITIGATED)

Contra Costa County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	641.00	Dwelling Unit	141.00	1,153,800.00	1833

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - based on project description and traffic report assumptions

Construction Phase - based on information provided by the applicant

Grading - based on information from applicant

Architectural Coating -

Vehicle Trips - based on traffic report

Area Mitigation -

Energy Mitigation -

Construction Off-road Equipment Mitigation - required mitigation

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	220.00	1,695.00
tblConstructionPhase	NumDays	3,100.00	1,695.00
tblConstructionPhase	NumDays	310.00	130.00
tblConstructionPhase	NumDays	220.00	15.00
tblConstructionPhase	NumDays	120.00	45.00
tblConstructionPhase	PhaseEndDate	12/20/2030	7/5/2024
tblConstructionPhase	PhaseStartDate	6/22/2024	1/8/2018
tblGrading	AcresOfGrading	325.00	141.00
tblLandUse	LotAcreage	208.12	141.00
tblProjectCharacteristics	OperationalYear	2014	2024
tblVehicleTrips	ST_TR	10.08	9.52
tblVehicleTrips	SU_TR	8.77	9.52
tblVehicleTrips	WD_TR	9.57	9.52

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	6.1733	69.6804	47.8610	0.0704	18.2360	3.3186	20.9915	9.9757	3.0531	12.5108	0.0000	6,503.2841	6,503.2841	1.9436	0.0000	6,544.0991
2018	14.1134	31.8041	39.0980	0.0787	3.0699	1.7452	4.8151	0.8234	1.6477	2.4711	0.0000	7,012.6323	7,012.6323	0.7943	0.0000	7,029.3131
2019	13.6408	28.7666	37.1638	0.0786	3.0698	1.5080	4.5778	0.8233	1.4239	2.2472	0.0000	6,864.8286	6,864.8286	0.7721	0.0000	6,881.0415
2020	13.2780	25.9286	35.6361	0.0786	3.0697	1.3099	4.3796	0.8233	1.2368	2.0600	0.0000	6,692.5612	6,692.5612	0.7547	0.0000	6,708.4093
2021	12.9619	23.2154	34.3611	0.0786	3.0698	1.1283	4.1982	0.8233	1.0651	1.8884	0.0000	6,649.9485	6,649.9485	0.7402	0.0000	6,665.4932
2022	12.7013	20.8361	33.3510	0.0786	3.0700	0.9658	4.0358	0.8234	0.9121	1.7355	0.0000	6,612.5407	6,612.5407	0.7310	0.0000	6,627.8908
2023	12.4886	18.9803	32.4743	0.0786	3.0701	0.8444	3.9145	0.8234	0.7974	1.6208	0.0000	6,575.6330	6,575.6330	0.7206	0.0000	6,590.7650
2024	12.3286	17.8933	31.7668	0.0786	3.0702	0.7487	3.8189	0.8235	0.7065	1.5299	0.0000	6,546.2579	6,546.2579	0.7127	0.0000	6,561.2243
Total	**97.6859**	**237.1046**	**291.7121**	**0.6206**	**39.7254**	**11.5691**	**50.7313**	**15.7393**	**10.8425**	**26.0637**	**0.0000**	**53,457.6861**	**53,457.6861**	**7.1691**	**0.0000**	**53,608.2362**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	4.2325	50.0878	37.9104	0.0704	18.2360	1.7118	19.6279	9.9757	1.6434	11.2942	0.0000	6,503.2841	6,503.2841	1.9436	0.0000	6,544.0991
2018	13.7462	30.1626	39.5689	0.0787	3.0699	1.5815	4.6514	0.8234	1.5042	2.3276	0.0000	7,012.6323	7,012.6323	0.7943	0.0000	7,029.3131
2019	13.3307	27.8217	37.8306	0.0786	3.0698	1.3791	4.4488	0.8233	1.3123	2.1356	0.0000	6,864.8286	6,864.8286	0.7721	0.0000	6,881.0415
2020	13.0113	25.5106	36.4550	0.0786	3.0697	1.2086	4.2783	0.8233	1.1507	1.9740	0.0000	6,692.5612	6,692.5612	0.7547	0.0000	6,708.4093
2021	12.7298	23.2615	35.2934	0.0786	3.0698	1.0488	4.1186	0.8233	0.9990	1.8224	0.0000	6,649.9485	6,649.9485	0.7402	0.0000	6,665.4932
2022	12.5034	21.4515	34.3608	0.0786	3.0700	0.9061	3.9761	0.8234	0.8643	1.6877	0.0000	6,612.5407	6,612.5407	0.7310	0.0000	6,627.8908
2023	12.3091	19.9114	33.5337	0.0786	3.0701	0.7970	3.8671	0.8234	0.7609	1.5843	0.0000	6,575.6330	6,575.6330	0.7206	0.0000	6,590.7650
2024	12.1660	19.0909	32.8772	0.0786	3.0702	0.7129	3.7831	0.8235	0.6806	1.5041	0.0000	6,546.2579	6,546.2579	0.7127	0.0000	6,561.2243
Total	**94.0289**	**217.2980**	**287.8299**	**0.6206**	**39.7254**	**9.3458**	**48.7513**	**15.7393**	**8.9155**	**24.3299**	**0.0000**	**53,457.6861**	**53,457.6861**	**7.1691**	**0.0000**	**53,608.2362**

	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	**3.74**	**8.35**	**1.33**	**0.00**	**0.00**	**19.22**	**3.90**	**0.00**	**17.77**	**6.65**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1,179.2406	15.7792	1,443.6678	0.4662		195.0599	195.0599		195.0541	195.0541	20,227.7373	8,805.2809	29,033.0181	16.2446	1.6428	29,883.4069
Energy	0.6682	5.7103	2.4299	0.0365		0.4617	0.4617		0.4617	0.4617		7,289.7268	7,289.7268	0.1397	0.1336	7,334.0909
Mobile	14.8343	23.0653	128.4077	0.4247	28.8363	0.4497	29.2859	7.6994	0.4152	8.1146		31,027.3682	31,027.3682	0.9813		31,047.9759
Total	**1,194.7431**	**44.5547**	**1,574.5054**	**0.9273**	**28.8363**	**195.9712**	**224.8075**	**7.6994**	**195.9310**	**203.6303**	**20,227.7373**	**47,122.3758**	**67,350.1131**	**17.3657**	**1.7764**	**68,265.4736**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	30.3368	0.6091	52.9403	2.7900e-003		1.2960	1.2960		1.2854	1.2854	0.0000	15,931.6926	15,931.6926	0.3949	0.2903	16,029.9894
Energy	0.5290	4.5205	1.9236	0.0289		0.3655	0.3655		0.3655	0.3655		5,770.8460	5,770.8460	0.1106	0.1058	5,805.9665
Mobile	14.8343	23.0653	128.4077	0.4247	28.8363	0.4497	29.2859	7.6994	0.4152	8.1146		31,027.3682	31,027.3682	0.9813		31,047.9759
Total	**45.7000**	**28.1949**	**183.2716**	**0.4563**	**28.8363**	**2.1111**	**30.9474**	**7.6994**	**2.0661**	**9.7655**	**0.0000**	**52,729.9068**	**52,729.9068**	**1.4868**	**0.3961**	**52,883.9318**

	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	96.17	36.72	88.36	50.79	0.00	98.92	86.23	0.00	98.95	95.20	100.00	-11.90	21.71	91.44	77.70	22.53

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/3/2017	6/2/2017	5	45	
2	Grading	Grading	6/3/2017	12/1/2017	5	130	
3	Paving	Paving	12/2/2017	12/22/2017	5	15	
4	Building Construction	Building Construction	12/23/2017	6/21/2024	5	1695	
5	Architectural Coating	Architectural Coating	1/8/2018	7/5/2024	5	1695	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 141

Acres of Paving: 0

Residential Indoor: 2,336,445; Residential Outdoor: 778,815; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Excavators	2	8.00	162	0.38
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	125	0.42
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	130	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Building Construction	Welders	1	8.00	46	0.45

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
Site Preparation	7	18.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	231.00	69.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	46.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Clean Paved Roads

3.2 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.8382	51.7535	39.3970	0.0391		2.7542	2.7542		2.5339	2.5339		4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**4.8382**	**51.7535**	**39.3970**	**0.0391**	**18.0663**	**2.7542**	**20.8205**	**9.9307**	**2.5339**	**12.4646**		**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0667	0.0795	0.9503	2.1200e-003	0.1698	1.2700e-003	0.1710	0.0450	1.1700e-003	0.0462		170.9236	170.9236	8.2500e-003		171.0968
Total	**0.0667**	**0.0795**	**0.9503**	**2.1200e-003**	**0.1698**	**1.2700e-003**	**0.1710**	**0.0450**	**1.1700e-003**	**0.0462**		**170.9236**	**170.9236**	**8.2500e-003**		**171.0968**

3.2 Site Preparation - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	1.9148	34.5727	23.6074	0.0391		1.3906	1.3906		1.3173	1.3173	0.0000	4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**1.9148**	**34.5727**	**23.6074**	**0.0391**	**18.0663**	**1.3906**	**19.4569**	**9.9307**	**1.3173**	**11.2480**	**0.0000**	**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0667	0.0795	0.9503	2.1200e-003	0.1698	1.2700e-003	0.1710	0.0450	1.1700e-003	0.0462		170.9236	170.9236	8.2500e-003		171.0968
Total	**0.0667**	**0.0795**	**0.9503**	**2.1200e-003**	**0.1698**	**1.2700e-003**	**0.1710**	**0.0450**	**1.1700e-003**	**0.0462**		**170.9236**	**170.9236**	**8.2500e-003**		**171.0968**

3.3 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1723	0.0000	7.1723	3.4344	0.0000	3.4344			0.0000			0.0000
Off-Road	6.0991	69.5920	46.8050	0.0617		3.3172	3.3172		3.0518	3.0518		6,313.3690	6,313.3690	1.9344		6,353.9915
Total	**6.0991**	**69.5920**	**46.8050**	**0.0617**	**7.1723**	**3.3172**	**10.4895**	**3.4344**	**3.0518**	**6.4862**		**6,313.3690**	**6,313.3690**	**1.9344**		**6,353.9915**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0741	0.0884	1.0559	2.3500e-003	0.1886	1.4100e-003	0.1900	0.0500	1.3000e-003	0.0513		189.9151	189.9151	9.1700e-003		190.1076
Total	**0.0741**	**0.0884**	**1.0559**	**2.3500e-003**	**0.1886**	**1.4100e-003**	**0.1900**	**0.0500**	**1.3000e-003**	**0.0513**		**189.9151**	**189.9151**	**9.1700e-003**		**190.1076**

3.3 Grading - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1723	0.0000	7.1723	3.4344	0.0000	3.4344			0.0000			0.0000
Off-Road	2.5464	49.9995	36.8545	0.0617		1.7103	1.7103		1.6421	1.6421	0.0000	6,313.3690	6,313.3690	1.9344		6,353.9915
Total	**2.5464**	**49.9995**	**36.8545**	**0.0617**	**7.1723**	**1.7103**	**8.8827**	**3.4344**	**1.6421**	**5.0765**	**0.0000**	**6,313.3690**	**6,313.3690**	**1.9344**		**6,353.9915**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0741	0.0884	1.0559	2.3500e-003	0.1886	1.4100e-003	0.1900	0.0500	1.3000e-003	0.0513		189.9151	189.9151	9.1700e-003		190.1076
Total	**0.0741**	**0.0884**	**1.0559**	**2.3500e-003**	**0.1886**	**1.4100e-003**	**0.1900**	**0.0500**	**1.3000e-003**	**0.0513**		**189.9151**	**189.9151**	**9.1700e-003**		**190.1076**

3.4 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9074	20.2964	14.7270	0.0223		1.1384	1.1384		1.0473	1.0473		2,281.0588	2,281.0588	0.6989		2,295.7360
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9074**	**20.2964**	**14.7270**	**0.0223**		**1.1384**	**1.1384**		**1.0473**	**1.0473**		**2,281.0588**	**2,281.0588**	**0.6989**		**2,295.7360**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0556	0.0663	0.7920	1.7600e-003	0.1415	1.0600e-003	0.1425	0.0375	9.8000e-004	0.0385		142.4363	142.4363	6.8800e-003		142.5807
Total	**0.0556**	**0.0663**	**0.7920**	**1.7600e-003**	**0.1415**	**1.0600e-003**	**0.1425**	**0.0375**	**9.8000e-004**	**0.0385**		**142.4363**	**142.4363**	**6.8800e-003**		**142.5807**

3.4 Paving - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9074	20.2964	14.7270	0.0223		1.1384	1.1384		1.0473	1.0473	0.0000	2,281.0588	2,281.0588	0.6989		2,295.7360
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9074**	**20.2964**	**14.7270**	**0.0223**		**1.1384**	**1.1384**		**1.0473**	**1.0473**	**0.0000**	**2,281.0588**	**2,281.0588**	**0.6989**		**2,295.7360**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0556	0.0663	0.7920	1.7600e-003	0.1415	1.0600e-003	0.1425	0.0375	9.8000e-004	0.0385		142.4363	142.4363	6.8800e-003		142.5807
Total	**0.0556**	**0.0663**	**0.7920**	**1.7600e-003**	**0.1415**	**1.0600e-003**	**0.1425**	**0.0375**	**9.8000e-004**	**0.0385**		**142.4363**	**142.4363**	**6.8800e-003**		**142.5807**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730		2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**3.1024**	**26.4057**	**18.1291**	**0.0268**		**1.7812**	**1.7812**		**1.6730**	**1.6730**		**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.7196	5.9963	7.2493	0.0164	0.4578	0.0879	0.5457	0.1306	0.0808	0.2114		1,617.0603	1,617.0603	0.0123		1,617.3189
Worker	0.8561	1.0205	12.1961	0.0272	2.1784	0.0163	2.1947	0.5778	0.0150	0.5928		2,193.5190	2,193.5190	0.1059		2,195.7428
Total	**1.5757**	**7.0169**	**19.4454**	**0.0436**	**2.6362**	**0.1043**	**2.7404**	**0.7083**	**0.0959**	**0.8042**		**3,810.5793**	**3,810.5793**	**0.1182**		**3,813.0618**

3.5 Building Construction - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6568	23.8718	18.3471	0.0268		1.5701	1.5701		1.4859	1.4859	0.0000	2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**2.6568**	**23.8718**	**18.3471**	**0.0268**		**1.5701**	**1.5701**		**1.4859**	**1.4859**	**0.0000**	**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.7196	5.9963	7.2493	0.0164	0.4578	0.0879	0.5457	0.1306	0.0808	0.2114		1,617.0603	1,617.0603	0.0123		1,617.3189
Worker	0.8561	1.0205	12.1961	0.0272	2.1784	0.0163	2.1947	0.5778	0.0150	0.5928		2,193.5190	2,193.5190	0.1059		2,195.7428
Total	**1.5757**	**7.0169**	**19.4454**	**0.0436**	**2.6362**	**0.1043**	**2.7404**	**0.7083**	**0.0959**	**0.8042**		**3,810.5793**	**3,810.5793**	**0.1182**		**3,813.0618**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6687	23.2608	17.5327	0.0268		1.4943	1.4943		1.4048	1.4048		2,609.9390	2,609.9390	0.6387		2,623.3517
Total	**2.6687**	**23.2608**	**17.5327**	**0.0268**		**1.4943**	**1.4943**		**1.4048**	**1.4048**		**2,609.9390**	**2,609.9390**	**0.6387**		**2,623.3517**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6409	5.4348	6.5630	0.0163	0.4577	0.0815	0.5391	0.1305	0.0749	0.2054		1,588.5677	1,588.5677	0.0121		1,588.8217
Worker	0.7685	0.9196	10.9647	0.0272	2.1784	0.0158	2.1942	0.5778	0.0146	0.5924		2,112.0881	2,112.0881	0.0974		2,114.1333
Total	**1.4095**	**6.3544**	**17.5277**	**0.0435**	**2.6361**	**0.0973**	**2.7333**	**0.7083**	**0.0895**	**0.7978**		**3,700.6558**	**3,700.6558**	**0.1095**		**3,702.9550**

3.5 Building Construction - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3015	21.6193	18.0035	0.0268		1.3306	1.3306		1.2613	1.2613	0.0000	2,609.9389	2,609.9389	0.6387		2,623.3517
Total	**2.3015**	**21.6193**	**18.0035**	**0.0268**		**1.3306**	**1.3306**		**1.2613**	**1.2613**	**0.0000**	**2,609.9389**	**2,609.9389**	**0.6387**		**2,623.3517**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6409	5.4348	6.5630	0.0163	0.4577	0.0815	0.5391	0.1305	0.0749	0.2054		1,588.5677	1,588.5677	0.0121		1,588.8217
Worker	0.7685	0.9196	10.9647	0.0272	2.1784	0.0158	2.1942	0.5778	0.0146	0.5924		2,112.0881	2,112.0881	0.0974		2,114.1333
Total	**1.4095**	**6.3544**	**17.5277**	**0.0435**	**2.6361**	**0.0973**	**2.7333**	**0.7083**	**0.0895**	**0.7978**		**3,700.6558**	**3,700.6558**	**0.1095**		**3,702.9550**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3516	20.9650	17.1204	0.0268		1.2850	1.2850		1.2083	1.2083		2,580.7618	2,580.7618	0.6279		2,593.9479
Total	**2.3516**	**20.9650**	**17.1204**	**0.0268**		**1.2850**	**1.2850**		**1.2083**	**1.2083**		**2,580.7618**	**2,580.7618**	**0.6279**		**2,593.9479**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5977	4.9618	6.2257	0.0163	0.4576	0.0757	0.5333	0.1305	0.0696	0.2001		1,561.0921	1,561.0921	0.0118		1,561.3400
Worker	0.7018	0.8376	9.9876	0.0272	2.1784	0.0155	2.1939	0.5778	0.0143	0.5921		2,036.0745	2,036.0745	0.0905		2,037.9757
Total	**1.2995**	**5.7994**	**16.2133**	**0.0435**	**2.6360**	**0.0912**	**2.7271**	**0.7083**	**0.0840**	**0.7922**		**3,597.1667**	**3,597.1667**	**0.1023**		**3,599.3157**

3.5 Building Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0415	20.0202	17.7871	0.0268		1.1561	1.1561		1.0967	1.0967	0.0000	2,580.7618	2,580.7618	0.6279		2,593.9479
Total	**2.0415**	**20.0202**	**17.7871**	**0.0268**		**1.1561**	**1.1561**		**1.0967**	**1.0967**	**0.0000**	**2,580.7618**	**2,580.7618**	**0.6279**		**2,593.9479**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5977	4.9618	6.2257	0.0163	0.4576	0.0757	0.5333	0.1305	0.0696	0.2001		1,561.0921	1,561.0921	0.0118		1,561.3400
Worker	0.7018	0.8376	9.9876	0.0272	2.1784	0.0155	2.1939	0.5778	0.0143	0.5921		2,036.0745	2,036.0745	0.0905		2,037.9757
Total	**1.2995**	**5.7994**	**16.2133**	**0.0435**	**2.6360**	**0.0912**	**2.7271**	**0.7083**	**0.0840**	**0.7922**		**3,597.1667**	**3,597.1667**	**0.1023**		**3,599.3157**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1113	19.0839	16.8084	0.0268		1.1128	1.1128		1.0465	1.0465		2,542.4799	2,542.4799	0.6194		2,555.4880
Total	**2.1113**	**19.0839**	**16.8084**	**0.0268**		**1.1128**	**1.1128**		**1.0465**	**1.0465**		**2,542.4799**	**2,542.4799**	**0.6194**		**2,555.4880**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5597	4.2364	5.9559	0.0163	0.4575	0.0678	0.5253	0.1305	0.0624	0.1928		1,525.3295	1,525.3295	0.0115		1,525.5700
Worker	0.6516	0.7709	9.2069	0.0272	2.1784	0.0153	2.1937	0.5778	0.0142	0.5919		1,954.1630	1,954.1630	0.0851		1,955.9493
Total	**1.2113**	**5.0073**	**15.1628**	**0.0434**	**2.6359**	**0.0831**	**2.7190**	**0.7082**	**0.0765**	**0.7848**		**3,479.4925**	**3,479.4925**	**0.0965**		**3,481.5192**

3.5 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8445	18.6659	17.6273	0.0268		1.0116	1.0116		0.9604	0.9604	0.0000	2,542.4799	2,542.4799	0.6194		2,555.4880
Total	**1.8445**	**18.6659**	**17.6273**	**0.0268**		**1.0116**	**1.0116**		**0.9604**	**0.9604**	**0.0000**	**2,542.4799**	**2,542.4799**	**0.6194**		**2,555.4880**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5597	4.2364	5.9559	0.0163	0.4575	0.0678	0.5253	0.1305	0.0624	0.1928		1,525.3295	1,525.3295	0.0115		1,525.5700
Worker	0.6516	0.7709	9.2069	0.0272	2.1784	0.0153	2.1937	0.5778	0.0142	0.5919		1,954.1630	1,954.1630	0.0851		1,955.9493
Total	**1.2113**	**5.0073**	**15.1628**	**0.0434**	**2.6359**	**0.0831**	**2.7190**	**0.7082**	**0.0765**	**0.7848**		**3,479.4925**	**3,479.4925**	**0.0965**		**3,481.5192**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8931	17.3403	16.5376	0.0268		0.9549	0.9549		0.8979	0.8979		2,542.7817	2,542.7817	0.6126		2,555.6462
Total	**1.8931**	**17.3403**	**16.5376**	**0.0268**		**0.9549**	**0.9549**		**0.8979**	**0.8979**		**2,542.7817**	**2,542.7817**	**0.6126**		**2,555.6462**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5279	3.4861	5.6663	0.0163	0.4576	0.0611	0.5187	0.1305	0.0562	0.1867		1,523.4004	1,523.4004	0.0114		1,523.6405
Worker	0.6158	0.7190	8.6226	0.0272	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,919.9839	1,919.9839	0.0808		1,921.6805
Total	**1.1437**	**4.2051**	**14.2889**	**0.0434**	**2.6360**	**0.0763**	**2.7124**	**0.7083**	**0.0703**	**0.7786**		**3,443.3843**	**3,443.3843**	**0.0922**		**3,445.3210**

3.5 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6610	17.3864	17.4699	0.0268		0.8754	0.8754		0.8318	0.8318	0.0000	2,542.7817	2,542.7817	0.6126		2,555.6462
Total	**1.6610**	**17.3864**	**17.4699**	**0.0268**		**0.8754**	**0.8754**		**0.8318**	**0.8318**	**0.0000**	**2,542.7817**	**2,542.7817**	**0.6126**		**2,555.6462**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5279	3.4861	5.6663	0.0163	0.4576	0.0611	0.5187	0.1305	0.0562	0.1867		1,523.4004	1,523.4004	0.0114		1,523.6405
Worker	0.6158	0.7190	8.6226	0.0272	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,919.9839	1,919.9839	0.0808		1,921.6805
Total	**1.1437**	**4.2051**	**14.2889**	**0.0434**	**2.6360**	**0.0763**	**2.7124**	**0.7083**	**0.0703**	**0.7786**		**3,443.3843**	**3,443.3843**	**0.0922**		**3,445.3210**

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	lb/day										lb/day					
Off-Road	1.6992	15.5364	16.3276	0.0268		0.8057	0.8057		0.7581	0.7581		2,543.7497	2,543.7497	0.6085		2,556.5286
Total	**1.6992**	**15.5364**	**16.3276**	**0.0268**		**0.8057**	**0.8057**		**0.7581**	**0.7581**		**2,543.7497**	**2,543.7497**	**0.6085**		**2,556.5286**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5139	3.0834	5.4960	0.0162	0.4578	0.0602	0.5180	0.1306	0.0554	0.1859		1,522.3492	1,522.3492	0.0117		1,522.5944
Worker	0.5838	0.6737	8.1007	0.0272	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,888.8576	1,888.8576	0.0771		1,890.4764
Total	**1.0978**	**3.7570**	**13.5967**	**0.0434**	**2.6362**	**0.0754**	**2.7115**	**0.7083**	**0.0695**	**0.7778**		**3,411.2068**	**3,411.2068**	**0.0888**		**3,413.0708**

3.5 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5013	16.1519	17.3373	0.0268		0.7460	0.7460		0.7103	0.7103	0.0000	2,543.7497	2,543.7497	0.6085		2,556.5286
Total	**1.5013**	**16.1519**	**17.3373**	**0.0268**		**0.7460**	**0.7460**		**0.7103**	**0.7103**	**0.0000**	**2,543.7497**	**2,543.7497**	**0.6085**		**2,556.5286**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5139	3.0834	5.4960	0.0162	0.4578	0.0602	0.5180	0.1306	0.0554	0.1859		1,522.3492	1,522.3492	0.0117		1,522.5944
Worker	0.5838	0.6737	8.1007	0.0272	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,888.8576	1,888.8576	0.0771		1,890.4764
Total	**1.0978**	**3.7570**	**13.5967**	**0.0434**	**2.6362**	**0.0754**	**2.7115**	**0.7083**	**0.0695**	**0.7778**		**3,411.2068**	**3,411.2068**	**0.0888**		**3,413.0708**

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	lb/day										lb/day					
Off-Road	1.5661	14.3126	16.2093	0.0268		0.6967	0.6967		0.6557	0.6557		2,544.6262	2,544.6262	0.6044		2,557.3191
Total	**1.5661**	**14.3126**	**16.2093**	**0.0268**		**0.6967**	**0.6967**		**0.6557**	**0.6557**		**2,544.6262**	**2,544.6262**	**0.6044**		**2,557.3191**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4828	2.6048	5.3072	0.0162	0.4579	0.0587	0.5166	0.1306	0.0540	0.1846		1,518.3847	1,518.3847	0.0108		1,518.6113
Worker	0.5541	0.6337	7.6278	0.0271	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,860.6541	1,860.6541	0.0738		1,862.2044
Total	**1.0369**	**3.2385**	**12.9350**	**0.0433**	**2.6363**	**0.0739**	**2.7102**	**0.7084**	**0.0681**	**0.7765**		**3,379.0388**	**3,379.0388**	**0.0846**		**3,380.8157**

3.5 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3867	15.2438	17.2686	0.0268		0.6493	0.6493		0.6192	0.6192	0.0000	2,544.6262	2,544.6262	0.6044		2,557.3191
Total	**1.3867**	**15.2438**	**17.2686**	**0.0268**		**0.6493**	**0.6493**		**0.6192**	**0.6192**	**0.0000**	**2,544.6262**	**2,544.6262**	**0.6044**		**2,557.3191**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4828	2.6048	5.3072	0.0162	0.4579	0.0587	0.5166	0.1306	0.0540	0.1846		1,518.3847	1,518.3847	0.0108		1,518.6113
Worker	0.5541	0.6337	7.6278	0.0271	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,860.6541	1,860.6541	0.0738		1,862.2044
Total	**1.0369**	**3.2385**	**12.9350**	**0.0433**	**2.6363**	**0.0739**	**2.7102**	**0.7084**	**0.0681**	**0.7765**		**3,379.0388**	**3,379.0388**	**0.0846**		**3,380.8157**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4653	13.3774	16.1332	0.0268		0.6106	0.6106		0.5744	0.5744		2,545.1154	2,545.1154	0.6009		2,557.7349
Total	**1.4653**	**13.3774**	**16.1332**	**0.0268**		**0.6106**	**0.6106**		**0.5744**	**0.5744**		**2,545.1154**	**2,545.1154**	**0.6009**		**2,557.7349**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4674	2.5796	5.1615	0.0162	0.4580	0.0590	0.5170	0.1307	0.0543	0.1850		1,518.9274	1,518.9274	0.0108		1,519.1549
Worker	0.5267	0.5984	7.2235	0.0271	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,835.2967	1,835.2967	0.0710		1,836.7866
Total	**0.9941**	**3.1779**	**12.3850**	**0.0433**	**2.6364**	**0.0742**	**2.7106**	**0.7084**	**0.0684**	**0.7768**		**3,354.2241**	**3,354.2241**	**0.0818**		**3,355.9415**

3.5 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3027	14.5750	17.2437	0.0268		0.5747	0.5747		0.5485	0.5485	0.0000	2,545.1154	2,545.1154	0.6009		2,557.7349
Total	**1.3027**	**14.5750**	**17.2437**	**0.0268**		**0.5747**	**0.5747**		**0.5485**	**0.5485**	**0.0000**	**2,545.1154**	**2,545.1154**	**0.6009**		**2,557.7349**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4674	2.5796	5.1615	0.0162	0.4580	0.0590	0.5170	0.1307	0.0543	0.1850		1,518.9274	1,518.9274	0.0108		1,519.1549
Worker	0.5267	0.5984	7.2235	0.0271	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,835.2967	1,835.2967	0.0710		1,836.7866
Total	**0.9941**	**3.1779**	**12.3850**	**0.0433**	**2.6364**	**0.0742**	**2.7106**	**0.7084**	**0.0684**	**0.7768**		**3,354.2241**	**3,354.2241**	**0.0818**		**3,355.9415**

3.6 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.0102
Total	**9.8822**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.0102**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1530	0.1831	2.1835	5.4100e-003	0.4338	3.1400e-003	0.4369	0.1151	2.9100e-003	0.1180		420.5890	420.5890	0.0194		420.9962
Total	**0.1530**	**0.1831**	**2.1835**	**5.4100e-003**	**0.4338**	**3.1400e-003**	**0.4369**	**0.1151**	**2.9100e-003**	**0.1180**		**420.5890**	**420.5890**	**0.0194**		**420.9962**

3.6 Architectural Coating - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506	0.0000	281.4485	281.4485	0.0267		282.0102
Total	**9.8822**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.0102**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1530	0.1831	2.1835	5.4100e-003	0.4338	3.1400e-003	0.4369	0.1151	2.9100e-003	0.1180		420.5890	420.5890	0.0194		420.9962
Total	**0.1530**	**0.1831**	**2.1835**	**5.4100e-003**	**0.4338**	**3.1400e-003**	**0.4369**	**0.1151**	**2.9100e-003**	**0.1180**		**420.5890**	**420.5890**	**0.0194**		**420.9962**

3.6 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		281.9473
Total	**9.8500**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**281.9473**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1398	0.1668	1.9889	5.4100e-003	0.4338	3.0800e-003	0.4369	0.1151	2.8500e-003	0.1179		405.4521	405.4521	0.0180		405.8307
Total	**0.1398**	**0.1668**	**1.9889**	**5.4100e-003**	**0.4338**	**3.0800e-003**	**0.4369**	**0.1151**	**2.8500e-003**	**0.1179**		**405.4521**	**405.4521**	**0.0180**		**405.8307**

3.6 Architectural Coating - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		281.9473
Total	**9.8500**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**281.9473**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1398	0.1668	1.9889	5.4100e-003	0.4338	3.0800e-003	0.4369	0.1151	2.8500e-003	0.1179		405.4521	405.4521	0.0180		405.8307
Total	**0.1398**	**0.1668**	**1.9889**	**5.4100e-003**	**0.4338**	**3.0800e-003**	**0.4369**	**0.1151**	**2.8500e-003**	**0.1179**		**405.4521**	**405.4521**	**0.0180**		**405.8307**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9057
Total	**9.8257**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9057**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1298	0.1535	1.8334	5.4100e-003	0.4338	3.0400e-003	0.4368	0.1151	2.8200e-003	0.1179		389.1407	389.1407	0.0169		389.4964
Total	**0.1298**	**0.1535**	**1.8334**	**5.4100e-003**	**0.4338**	**3.0400e-003**	**0.4368**	**0.1151**	**2.8200e-003**	**0.1179**		**389.1407**	**389.1407**	**0.0169**		**389.4964**

3.6 Architectural Coating - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9057
Total	**9.8257**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9057**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1298	0.1535	1.8334	5.4100e-003	0.4338	3.0400e-003	0.4368	0.1151	2.8200e-003	0.1179		389.1407	389.1407	0.0169		389.4964
Total	**0.1298**	**0.1535**	**1.8334**	**5.4100e-003**	**0.4338**	**3.0400e-003**	**0.4368**	**0.1151**	**2.8200e-003**	**0.1179**		**389.1407**	**389.1407**	**0.0169**		**389.4964**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.8537
Total	**9.8025**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.8537**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1226	0.1432	1.7171	5.4100e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		382.3345	382.3345	0.0161		382.6723
Total	**0.1226**	**0.1432**	**1.7171**	**5.4100e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**382.3345**	**382.3345**	**0.0161**		**382.6723**

3.6 Architectural Coating - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.8537
Total	**9.8025**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.8537**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1226	0.1432	1.7171	5.4100e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		382.3345	382.3345	0.0161		382.6723
Total	**0.1226**	**0.1432**	**1.7171**	**5.4100e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**382.3345**	**382.3345**	**0.0161**		**382.6723**

3.6 Architectural Coating - 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	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.8329
Total	**9.7881**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.8329**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1163	0.1342	1.6131	5.4100e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		376.1362	376.1362	0.0154		376.4585
Total	**0.1163**	**0.1342**	**1.6131**	**5.4100e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**376.1362**	**376.1362**	**0.0154**		**376.4585**

3.6 Architectural Coating - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.8329
Total	**9.7881**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.8329**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1163	0.1342	1.6131	5.4100e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		376.1362	376.1362	0.0154		376.4585
Total	**0.1163**	**0.1342**	**1.6131**	**5.4100e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**376.1362**	**376.1362**	**0.0154**		**376.4585**

3.6 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	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8017
Total	**9.7752**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8017**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1103	0.1262	1.5190	5.4100e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		370.5199	370.5199	0.0147		370.8286
Total	**0.1103**	**0.1262**	**1.5190**	**5.4100e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**370.5199**	**370.5199**	**0.0147**		**370.8286**

3.6 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8017
Total	**9.7752**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8017**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1103	0.1262	1.5190	5.4100e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		370.5199	370.5199	0.0147		370.8286
Total	**0.1103**	**0.1262**	**1.5190**	**5.4100e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**370.5199**	**370.5199**	**0.0147**		**370.8286**

3.6 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609		281.4481	281.4481	0.0159		281.7809
Total	**9.7643**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**		**281.4481**	**281.4481**	**0.0159**		**281.7809**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1049	0.1192	1.4384	5.4000e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		365.4703	365.4703	0.0141		365.7670
Total	**0.1049**	**0.1192**	**1.4384**	**5.4000e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**365.4703**	**365.4703**	**0.0141**		**365.7670**

3.6 Architectural Coating - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609	0.0000	281.4481	281.4481	0.0159		281.7809
Total	**9.7643**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**	**0.0000**	**281.4481**	**281.4481**	**0.0159**		**281.7809**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1049	0.1192	1.4384	5.4000e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		365.4703	365.4703	0.0141		365.7670
Total	**0.1049**	**0.1192**	**1.4384**	**5.4000e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**365.4703**	**365.4703**	**0.0141**		**365.7670**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	14.8343	23.0653	128.4077	0.4247	28.8363	0.4497	29.2859	7.6994	0.4152	8.1146		31,027.3682	31,027.3682	0.9813		31,047.9759
Unmitigated	14.8343	23.0653	128.4077	0.4247	28.8363	0.4497	29.2859	7.6994	0.4152	8.1146		31,027.3682	31,027.3682	0.9813		31,047.9759

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	6,102.32	6,102.32	6102.32	13,622,612	13,622,612
Total	6,102.32	6,102.32	6,102.32	13,622,612	13,622,612

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	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.527459	0.065504	0.176626	0.142970	0.035962	0.004781	0.010016	0.023598	0.001244	0.001463	0.006483	0.001857	0.002036

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.5290	4.5205	1.9236	0.0289		0.3655	0.3655		0.3655	0.3655		5,770.8460	5,770.8460	0.1106	0.1058	5,805.9665
NaturalGas Unmitigated	0.6682	5.7103	2.4299	0.0365		0.4617	0.4617		0.4617	0.4617		7,289.7268	7,289.7268	0.1397	0.1336	7,334.0909

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	61962.7	0.6682	5.7103	2.4299	0.0365		0.4617	0.4617		0.4617	0.4617		7,289.7268	7,289.7268	0.1397	0.1336	7,334.0909
Total		**0.6682**	**5.7103**	**2.4299**	**0.0365**		**0.4617**	**0.4617**		**0.4617**	**0.4617**		**7,289.7268**	**7,289.7268**	**0.1397**	**0.1336**	**7,334.0909**

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	lb/day										lb/day					
Single Family Housing	49.0522	0.5290	4.5205	1.9236	0.0289		0.3655	0.3655		0.3655	0.3655		5,770.8460	5,770.8460	0.1106	0.1058	5,805.9665
Total		**0.5290**	**4.5205**	**1.9236**	**0.0289**		**0.3655**	**0.3655**		**0.3655**	**0.3655**		**5,770.8460**	**5,770.8460**	**0.1106**	**0.1058**	**5,805.9665**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	30.3368	0.6091	52.9403	2.7900e-003		1.2960	1.2960		1.2854	1.2854	0.0000	15,931.6926	15,931.6926	0.3949	0.2903	16,029.9894
Unmitigated	1,179.2406	15.7792	1,443.6678	0.4662		195.0599	195.0599		195.0541	195.0541	20,227.7373	8,805.2809	29,033.0181	16.2446	1.6428	29,883.4069

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	4.4505					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	24.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1,148.5094	15.1701	1,390.8067	0.4634		194.7669	194.7669		194.7611	194.7611	20,227.7373	8,710.0588	28,937.7961	16.1532	1.6428	29,786.2662
Landscaping	1.5894	0.6091	52.8611	2.7900e-003		0.2930	0.2930		0.2930	0.2930		95.2220	95.2220	0.0914		97.1407
Total	**1,179.2406**	**15.7792**	**1,443.6678**	**0.4662**		**195.0599**	**195.0599**		**195.0541**	**195.0541**	**20,227.7373**	**8,805.2808**	**29,033.0181**	**16.2446**	**1.6428**	**29,883.4069**

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	lb/day										lb/day					
Architectural Coating	4.4505					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	22.8452					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.4517	7.0000e-005	0.0792	0.0000		1.0030	1.0030		0.9924	0.9924	0.0000	15,836.4706	15,836.4706	0.3035	0.2903	15,932.8487
Landscaping	1.5894	0.6091	52.8611	2.7900e-003		0.2930	0.2930		0.2930	0.2930		95.2220	95.2220	0.0914		97.1407
Total	**30.3368**	**0.6091**	**52.9403**	**2.7900e-003**		**1.2960**	**1.2960**		**1.2854**	**1.2854**	**0.0000**	**15,931.6926**	**15,931.6926**	**0.3949**	**0.2903**	**16,029.9894**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Vegetation

Vineyards at Sand Creek (MITIGATED)

Contra Costa County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	641.00	Dwelling Unit	141.00	1,153,800.00	1833

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - based on project description and traffic report assumptions

Construction Phase - based on information provided by the applicant

Grading - based on information from applicant

Architectural Coating -

Vehicle Trips - based on traffic report

Area Mitigation -

Energy Mitigation -

Construction Off-road Equipment Mitigation - required mitigation

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	220.00	1,695.00
tblConstructionPhase	NumDays	3,100.00	1,695.00
tblConstructionPhase	NumDays	310.00	130.00
tblConstructionPhase	NumDays	220.00	15.00
tblConstructionPhase	NumDays	120.00	45.00
tblConstructionPhase	PhaseEndDate	12/20/2030	7/5/2024
tblConstructionPhase	PhaseStartDate	6/22/2024	1/8/2018
tblGrading	AcresOfGrading	325.00	141.00
tblLandUse	LotAcreage	208.12	141.00
tblProjectCharacteristics	OperationalYear	2014	2024
tblVehicleTrips	ST_TR	10.08	9.52
tblVehicleTrips	SU_TR	8.77	9.52
tblVehicleTrips	WD_TR	9.57	9.52

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	6.1700	69.7011	47.8026	0.0678	18.2360	3.3186	20.9915	9.9757	3.0531	12.5108	0.0000	6,485.5868	6,485.5868	1.9436	0.0000	6,526.4018
2018	14.2161	32.3158	42.7778	0.0756	3.0699	1.7460	4.8159	0.8234	1.6485	2.4719	0.0000	6,764.0859	6,764.0859	0.7947	0.0000	6,780.7737
2019	13.7259	29.2311	40.7482	0.0755	3.0698	1.5088	4.5786	0.8233	1.4245	2.2479	0.0000	6,624.7246	6,624.7246	0.7724	0.0000	6,640.9447
2020	13.3509	26.3393	39.1602	0.0755	3.0697	1.3105	4.3802	0.8233	1.2373	2.0606	0.0000	6,461.6488	6,461.6488	0.7550	0.0000	6,477.5043
2021	13.0230	23.5791	37.8277	0.0755	3.0698	1.1289	4.1987	0.8233	1.0656	1.8889	0.0000	6,422.6872	6,422.6872	0.7406	0.0000	6,438.2395
2022	12.7543	21.1687	36.6245	0.0755	3.0700	0.9664	4.0363	0.8234	0.9126	1.7360	0.0000	6,388.5862	6,388.5862	0.7313	0.0000	6,403.9444
2023	12.5386	19.2740	35.6730	0.0754	3.0701	0.8449	3.9150	0.8234	0.7978	1.6212	0.0000	6,354.6298	6,354.6298	0.7210	0.0000	6,369.7698
2024	12.3724	18.1732	34.8033	0.0754	3.0702	0.7492	3.8194	0.8235	0.7069	1.5304	0.0000	6,327.8833	6,327.8833	0.7131	0.0000	6,342.8577
Total	**98.1512**	**239.7822**	**315.4173**	**0.5961**	**39.7254**	**11.5733**	**50.7355**	**15.7393**	**10.8464**	**26.0676**	**0.0000**	**51,829.8324**	**51,829.8324**	**7.1716**	**0.0000**	**51,980.4359**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	4.3811	50.1086	41.6568	0.0678	18.2360	1.7118	19.6279	9.9757	1.6434	11.2942	0.0000	6,485.5868	6,485.5868	1.9436	0.0000	6,526.4018
2018	13.8489	30.6743	43.2487	0.0756	3.0699	1.5823	4.6522	0.8234	1.5050	2.3284	0.0000	6,764.0859	6,764.0859	0.7947	0.0000	6,780.7737
2019	13.4158	28.2862	41.4150	0.0755	3.0698	1.3798	4.4496	0.8233	1.3130	2.1363	0.0000	6,624.7246	6,624.7246	0.7724	0.0000	6,640.9447
2020	13.0841	25.9213	39.9791	0.0755	3.0697	1.2093	4.2790	0.8233	1.1513	1.9746	0.0000	6,461.6488	6,461.6488	0.7550	0.0000	6,477.5043
2021	12.7909	23.6252	38.7600	0.0755	3.0698	1.0493	4.1192	0.8233	0.9995	1.8229	0.0000	6,422.6872	6,422.6872	0.7406	0.0000	6,438.2395
2022	12.5564	21.7842	37.6343	0.0755	3.0700	0.9067	3.9766	0.8234	0.8648	1.6882	0.0000	6,388.5862	6,388.5862	0.7313	0.0000	6,403.9444
2023	12.3591	20.2052	36.7324	0.0754	3.0701	0.7975	3.8676	0.8234	0.7613	1.5848	0.0000	6,354.6298	6,354.6298	0.7210	0.0000	6,369.7698
2024	12.2098	19.3708	35.9138	0.0754	3.0702	0.7134	3.7835	0.8235	0.6811	1.5046	0.0000	6,327.8832	6,327.8832	0.7131	0.0000	6,342.8577
Total	**94.6461**	**219.9756**	**315.3399**	**0.5961**	**39.7254**	**9.3500**	**48.7555**	**15.7393**	**8.9194**	**24.3338**	**0.0000**	**51,829.8324**	**51,829.8324**	**7.1716**	**0.0000**	**51,980.4359**

	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	**3.57**	**8.26**	**0.02**	**0.00**	**0.00**	**19.21**	**3.90**	**0.00**	**17.77**	**6.65**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1,179.2406	15.7792	1,443.6678	0.4662		195.0599	195.0599		195.0541	195.0541	20,227.7373	8,805.2809	29,033.0181	16.2446	1.6428	29,883.4069
Energy	0.6682	5.7103	2.4299	0.0365		0.4617	0.4617		0.4617	0.4617		7,289.7268	7,289.7268	0.1397	0.1336	7,334.0909
Mobile	14.6283	25.8570	146.1227	0.3925	28.8363	0.4513	29.2876	7.6994	0.4167	8.1161		28,789.1641	28,789.1641	0.9828		28,809.8026
Total	**1,194.5371**	**47.3464**	**1,592.2204**	**0.8951**	**28.8363**	**195.9728**	**224.8091**	**7.6994**	**195.9325**	**203.6318**	**20,227.7373**	**44,884.1717**	**65,111.9090**	**17.3671**	**1.7764**	**66,027.3003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	30.3368	0.6091	52.9403	2.7900e-003		1.2960	1.2960		1.2854	1.2854	0.0000	15,931.6926	15,931.6926	0.3949	0.2903	16,029.9894
Energy	0.5290	4.5205	1.9236	0.0289		0.3655	0.3655		0.3655	0.3655		5,770.8460	5,770.8460	0.1106	0.1058	5,805.9665
Mobile	14.6283	25.8570	146.1227	0.3925	28.8363	0.4513	29.2876	7.6994	0.4167	8.1161		28,789.1641	28,789.1641	0.9828		28,809.8026
Total	**45.4940**	**30.9866**	**200.9866**	**0.4241**	**28.8363**	**2.1127**	**30.9490**	**7.6994**	**2.0676**	**9.7670**	**0.0000**	**50,491.7027**	**50,491.7027**	**1.4883**	**0.3961**	**50,645.7584**

	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	**96.19**	**34.55**	**87.38**	**52.62**	**0.00**	**98.92**	**86.23**	**0.00**	**98.94**	**95.20**	**100.00**	**-12.49**	**22.45**	**91.43**	**77.70**	**23.30**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/3/2017	6/2/2017	5	45	
2	Grading	Grading	6/3/2017	12/1/2017	5	130	
3	Paving	Paving	12/2/2017	12/22/2017	5	15	
4	Building Construction	Building Construction	12/23/2017	6/21/2024	5	1695	
5	Architectural Coating	Architectural Coating	1/8/2018	7/5/2024	5	1695	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 141

Acres of Paving: 0

Residential Indoor: 2,336,445; Residential Outdoor: 778,815; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Excavators	2	8.00	162	0.38
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	125	0.42
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	130	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Building Construction	Welders	1	8.00	46	0.45

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
Site Preparation	7	18.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	231.00	69.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	46.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Clean Paved Roads

3.2 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.8382	51.7535	39.3970	0.0391		2.7542	2.7542		2.5339	2.5339		4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**4.8382**	**51.7535**	**39.3970**	**0.0391**	**18.0663**	**2.7542**	**20.8205**	**9.9307**	**2.5339**	**12.4646**		**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0638	0.0982	0.8978	1.9200e-003	0.1698	1.2700e-003	0.1710	0.0450	1.1700e-003	0.0462		154.9960	154.9960	8.2500e-003		155.1693
Total	**0.0638**	**0.0982**	**0.8978**	**1.9200e-003**	**0.1698**	**1.2700e-003**	**0.1710**	**0.0450**	**1.1700e-003**	**0.0462**		**154.9960**	**154.9960**	**8.2500e-003**		**155.1693**

3.2 Site Preparation - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	1.9148	34.5727	23.6074	0.0391		1.3906	1.3906		1.3173	1.3173	0.0000	4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**1.9148**	**34.5727**	**23.6074**	**0.0391**	**18.0663**	**1.3906**	**19.4569**	**9.9307**	**1.3173**	**11.2480**	**0.0000**	**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0638	0.0982	0.8978	1.9200e-003	0.1698	1.2700e-003	0.1710	0.0450	1.1700e-003	0.0462		154.9960	154.9960	8.2500e-003		155.1693
Total	**0.0638**	**0.0982**	**0.8978**	**1.9200e-003**	**0.1698**	**1.2700e-003**	**0.1710**	**0.0450**	**1.1700e-003**	**0.0462**		**154.9960**	**154.9960**	**8.2500e-003**		**155.1693**

3.3 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1723	0.0000	7.1723	3.4344	0.0000	3.4344			0.0000			0.0000
Off-Road	6.0991	69.5920	46.8050	0.0617		3.3172	3.3172		3.0518	3.0518		6,313.3690	6,313.3690	1.9344		6,353.9915
Total	**6.0991**	**69.5920**	**46.8050**	**0.0617**	**7.1723**	**3.3172**	**10.4895**	**3.4344**	**3.0518**	**6.4862**		**6,313.3690**	**6,313.3690**	**1.9344**		**6,353.9915**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0709	0.1091	0.9976	2.1300e-003	0.1886	1.4100e-003	0.1900	0.0500	1.3000e-003	0.0513		172.2178	172.2178	9.1700e-003		172.4103
Total	**0.0709**	**0.1091**	**0.9976**	**2.1300e-003**	**0.1886**	**1.4100e-003**	**0.1900**	**0.0500**	**1.3000e-003**	**0.0513**		**172.2178**	**172.2178**	**9.1700e-003**		**172.4103**

3.3 Grading - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1723	0.0000	7.1723	3.4344	0.0000	3.4344			0.0000			0.0000
Off-Road	2.5464	49.9995	36.8545	0.0617		1.7103	1.7103		1.6421	1.6421	0.0000	6,313.3690	6,313.3690	1.9344		6,353.9915
Total	**2.5464**	**49.9995**	**36.8545**	**0.0617**	**7.1723**	**1.7103**	**8.8827**	**3.4344**	**1.6421**	**5.0765**	**0.0000**	**6,313.3690**	**6,313.3690**	**1.9344**		**6,353.9915**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0709	0.1091	0.9976	2.1300e-003	0.1886	1.4100e-003	0.1900	0.0500	1.3000e-003	0.0513		172.2178	172.2178	9.1700e-003		172.4103
Total	**0.0709**	**0.1091**	**0.9976**	**2.1300e-003**	**0.1886**	**1.4100e-003**	**0.1900**	**0.0500**	**1.3000e-003**	**0.0513**		**172.2178**	**172.2178**	**9.1700e-003**		**172.4103**

3.4 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9074	20.2964	14.7270	0.0223		1.1384	1.1384		1.0473	1.0473		2,281.0588	2,281.0588	0.6989		2,295.7360
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9074**	**20.2964**	**14.7270**	**0.0223**		**1.1384**	**1.1384**		**1.0473**	**1.0473**		**2,281.0588**	**2,281.0588**	**0.6989**		**2,295.7360**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0532	0.0818	0.7482	1.6000e-003	0.1415	1.0600e-003	0.1425	0.0375	9.8000e-004	0.0385		129.1633	129.1633	6.8800e-003		129.3077
Total	**0.0532**	**0.0818**	**0.7482**	**1.6000e-003**	**0.1415**	**1.0600e-003**	**0.1425**	**0.0375**	**9.8000e-004**	**0.0385**		**129.1633**	**129.1633**	**6.8800e-003**		**129.3077**

3.4 Paving - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9074	20.2964	14.7270	0.0223		1.1384	1.1384		1.0473	1.0473	0.0000	2,281.0588	2,281.0588	0.6989		2,295.7360
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9074**	**20.2964**	**14.7270**	**0.0223**		**1.1384**	**1.1384**		**1.0473**	**1.0473**	**0.0000**	**2,281.0588**	**2,281.0588**	**0.6989**		**2,295.7360**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0532	0.0818	0.7482	1.6000e-003	0.1415	1.0600e-003	0.1425	0.0375	9.8000e-004	0.0385		129.1633	129.1633	6.8800e-003		129.3077
Total	**0.0532**	**0.0818**	**0.7482**	**1.6000e-003**	**0.1415**	**1.0600e-003**	**0.1425**	**0.0375**	**9.8000e-004**	**0.0385**		**129.1633**	**129.1633**	**6.8800e-003**		**129.3077**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730		2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**3.1024**	**26.4057**	**18.1291**	**0.0268**		**1.7812**	**1.7812**		**1.6730**	**1.6730**		**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.9059	6.2771	11.7873	0.0163	0.4578	0.0888	0.5466	0.1306	0.0817	0.2122		1,604.6151	1,604.6151	0.0126		1,604.8806
Worker	0.8185	1.2603	11.5223	0.0246	2.1784	0.0163	2.1947	0.5778	0.0150	0.5928		1,989.1153	1,989.1153	0.1059		1,991.3391
Total	**1.7244**	**7.5374**	**23.3097**	**0.0410**	**2.6362**	**0.1052**	**2.7413**	**0.7083**	**0.0967**	**0.8050**		**3,593.7304**	**3,593.7304**	**0.1185**		**3,596.2197**

3.5 Building Construction - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6568	23.8718	18.3471	0.0268		1.5701	1.5701		1.4859	1.4859	0.0000	2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**2.6568**	**23.8718**	**18.3471**	**0.0268**		**1.5701**	**1.5701**		**1.4859**	**1.4859**	**0.0000**	**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.9059	6.2771	11.7873	0.0163	0.4578	0.0888	0.5466	0.1306	0.0817	0.2122		1,604.6151	1,604.6151	0.0126		1,604.8806
Worker	0.8185	1.2603	11.5223	0.0246	2.1784	0.0163	2.1947	0.5778	0.0150	0.5928		1,989.1153	1,989.1153	0.1059		1,991.3391
Total	**1.7244**	**7.5374**	**23.3097**	**0.0410**	**2.6362**	**0.1052**	**2.7413**	**0.7083**	**0.0967**	**0.8050**		**3,593.7304**	**3,593.7304**	**0.1185**		**3,596.2197**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6687	23.2608	17.5327	0.0268		1.4943	1.4943		1.4048	1.4048		2,609.9390	2,609.9390	0.6387		2,623.3517
Total	**2.6687**	**23.2608**	**17.5327**	**0.0268**		**1.4943**	**1.4943**		**1.4048**	**1.4048**		**2,609.9390**	**2,609.9390**	**0.6387**		**2,623.3517**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.7935	5.6873	11.0846	0.0163	0.4577	0.0823	0.5399	0.1305	0.0757	0.2062		1,576.3062	1,576.3062	0.0124		1,576.5672
Worker	0.7270	1.1358	10.2627	0.0246	2.1784	0.0158	2.1942	0.5778	0.0146	0.5924		1,915.0418	1,915.0418	0.0974		1,917.0871
Total	**1.5205**	**6.8230**	**21.3473**	**0.0409**	**2.6361**	**0.0981**	**2.7341**	**0.7083**	**0.0903**	**0.7986**		**3,491.3480**	**3,491.3480**	**0.1098**		**3,493.6542**

3.5 Building Construction - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3015	21.6193	18.0035	0.0268		1.3306	1.3306		1.2613	1.2613	0.0000	2,609.9389	2,609.9389	0.6387		2,623.3517
Total	**2.3015**	**21.6193**	**18.0035**	**0.0268**		**1.3306**	**1.3306**		**1.2613**	**1.2613**	**0.0000**	**2,609.9389**	**2,609.9389**	**0.6387**		**2,623.3517**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.7935	5.6873	11.0846	0.0163	0.4577	0.0823	0.5399	0.1305	0.0757	0.2062		1,576.3062	1,576.3062	0.0124		1,576.5672
Worker	0.7270	1.1358	10.2627	0.0246	2.1784	0.0158	2.1942	0.5778	0.0146	0.5924		1,915.0418	1,915.0418	0.0974		1,917.0871
Total	**1.5205**	**6.8230**	**21.3473**	**0.0409**	**2.6361**	**0.0981**	**2.7341**	**0.7083**	**0.0903**	**0.7986**		**3,491.3480**	**3,491.3480**	**0.1098**		**3,493.6542**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3516	20.9650	17.1204	0.0268		1.2850	1.2850		1.2083	1.2083		2,580.7618	2,580.7618	0.6279		2,593.9479
Total	**2.3516**	**20.9650**	**17.1204**	**0.0268**		**1.2850**	**1.2850**		**1.2083**	**1.2083**		**2,580.7618**	**2,580.7618**	**0.6279**		**2,593.9479**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.7341	5.1902	10.6657	0.0163	0.4576	0.0765	0.5340	0.1305	0.0703	0.2008		1,549.0149	1,549.0149	0.0122		1,549.2700
Worker	0.6590	1.0345	9.2741	0.0246	2.1784	0.0155	2.1939	0.5778	0.0143	0.5921		1,845.9150	1,845.9150	0.0905		1,847.8162
Total	**1.3930**	**6.2246**	**19.9398**	**0.0409**	**2.6360**	**0.0919**	**2.7279**	**0.7083**	**0.0847**	**0.7929**		**3,394.9299**	**3,394.9299**	**0.1027**		**3,397.0861**

3.5 Building Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0415	20.0202	17.7871	0.0268		1.1561	1.1561		1.0967	1.0967	0.0000	2,580.7618	2,580.7618	0.6279		2,593.9479
Total	**2.0415**	**20.0202**	**17.7871**	**0.0268**		**1.1561**	**1.1561**		**1.0967**	**1.0967**	**0.0000**	**2,580.7618**	**2,580.7618**	**0.6279**		**2,593.9479**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.7341	5.1902	10.6657	0.0163	0.4576	0.0765	0.5340	0.1305	0.0703	0.2008		1,549.0149	1,549.0149	0.0122		1,549.2700
Worker	0.6590	1.0345	9.2741	0.0246	2.1784	0.0155	2.1939	0.5778	0.0143	0.5921		1,845.9150	1,845.9150	0.0905		1,847.8162
Total	**1.3930**	**6.2246**	**19.9398**	**0.0409**	**2.6360**	**0.0919**	**2.7279**	**0.7083**	**0.0847**	**0.7929**		**3,394.9299**	**3,394.9299**	**0.1027**		**3,397.0861**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1113	19.0839	16.8084	0.0268		1.1128	1.1128		1.0465	1.0465		2,542.4799	2,542.4799	0.6194		2,555.4880
Total	**2.1113**	**19.0839**	**16.8084**	**0.0268**		**1.1128**	**1.1128**		**1.0465**	**1.0465**		**2,542.4799**	**2,542.4799**	**0.6194**		**2,555.4880**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6829	4.4309	10.3225	0.0162	0.4575	0.0684	0.5260	0.1305	0.0630	0.1934		1,513.4913	1,513.4913	0.0118		1,513.7391
Worker	0.6096	0.9512	8.5043	0.0246	2.1784	0.0153	2.1937	0.5778	0.0142	0.5919		1,771.4694	1,771.4694	0.0851		1,773.2557
Total	**1.2925**	**5.3821**	**18.8268**	**0.0408**	**2.6359**	**0.0837**	**2.7196**	**0.7082**	**0.0771**	**0.7853**		**3,284.9607**	**3,284.9607**	**0.0969**		**3,286.9948**

3.5 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8445	18.6659	17.6273	0.0268		1.0116	1.0116		0.9604	0.9604	0.0000	2,542.4799	2,542.4799	0.6194		2,555.4880
Total	**1.8445**	**18.6659**	**17.6273**	**0.0268**		**1.0116**	**1.0116**		**0.9604**	**0.9604**	**0.0000**	**2,542.4799**	**2,542.4799**	**0.6194**		**2,555.4880**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6829	4.4309	10.3225	0.0162	0.4575	0.0684	0.5260	0.1305	0.0630	0.1934		1,513.4913	1,513.4913	0.0118		1,513.7391
Worker	0.6096	0.9512	8.5043	0.0246	2.1784	0.0153	2.1937	0.5778	0.0142	0.5919		1,771.4694	1,771.4694	0.0851		1,773.2557
Total	**1.2925**	**5.3821**	**18.8268**	**0.0408**	**2.6359**	**0.0837**	**2.7196**	**0.7082**	**0.0771**	**0.7853**		**3,284.9607**	**3,284.9607**	**0.0969**		**3,286.9948**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8931	17.3403	16.5376	0.0268		0.9549	0.9549		0.8979	0.8979		2,542.7817	2,542.7817	0.6126		2,555.6462
Total	**1.8931**	**17.3403**	**16.5376**	**0.0268**		**0.9549**	**0.9549**		**0.8979**	**0.8979**		**2,542.7817**	**2,542.7817**	**0.6126**		**2,555.6462**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6373	3.6489	9.9557	0.0162	0.4576	0.0617	0.5193	0.1305	0.0567	0.1872		1,511.5609	1,511.5609	0.0118		1,511.8087
Worker	0.5755	0.8865	7.9363	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,740.3361	1,740.3361	0.0808		1,742.0327
Total	**1.2128**	**4.5354**	**17.8921**	**0.0408**	**2.6360**	**0.0769**	**2.7129**	**0.7083**	**0.0708**	**0.7791**		**3,251.8969**	**3,251.8969**	**0.0926**		**3,253.8414**

3.5 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6610	17.3864	17.4699	0.0268		0.8754	0.8754		0.8318	0.8318	0.0000	2,542.7817	2,542.7817	0.6126		2,555.6462
Total	**1.6610**	**17.3864**	**17.4699**	**0.0268**		**0.8754**	**0.8754**		**0.8318**	**0.8318**	**0.0000**	**2,542.7817**	**2,542.7817**	**0.6126**		**2,555.6462**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6373	3.6489	9.9557	0.0162	0.4576	0.0617	0.5193	0.1305	0.0567	0.1872		1,511.5609	1,511.5609	0.0118		1,511.8087
Worker	0.5755	0.8865	7.9363	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,740.3361	1,740.3361	0.0808		1,742.0327
Total	**1.2128**	**4.5354**	**17.8921**	**0.0408**	**2.6360**	**0.0769**	**2.7129**	**0.7083**	**0.0708**	**0.7791**		**3,251.8969**	**3,251.8969**	**0.0926**		**3,253.8414**

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	lb/day										lb/day					
Off-Road	1.6992	15.5364	16.3276	0.0268		0.8057	0.8057		0.7581	0.7581		2,543.7497	2,543.7497	0.6085		2,556.5286
Total	**1.6992**	**15.5364**	**16.3276**	**0.0268**		**0.8057**	**0.8057**		**0.7581**	**0.7581**		**2,543.7497**	**2,543.7497**	**0.6085**		**2,556.5286**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6134	3.2285	9.5744	0.0162	0.4578	0.0607	0.5185	0.1306	0.0559	0.1864		1,510.5177	1,510.5177	0.0121		1,510.7710
Worker	0.5451	0.8300	7.4295	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,711.9609	1,711.9609	0.0771		1,713.5796
Total	**1.1585**	**4.0585**	**17.0039**	**0.0408**	**2.6362**	**0.0759**	**2.7121**	**0.7083**	**0.0700**	**0.7783**		**3,222.4786**	**3,222.4786**	**0.0891**		**3,224.3506**

3.5 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5013	16.1519	17.3373	0.0268		0.7460	0.7460		0.7103	0.7103	0.0000	2,543.7497	2,543.7497	0.6085		2,556.5286
Total	**1.5013**	**16.1519**	**17.3373**	**0.0268**		**0.7460**	**0.7460**		**0.7103**	**0.7103**	**0.0000**	**2,543.7497**	**2,543.7497**	**0.6085**		**2,556.5286**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6134	3.2285	9.5744	0.0162	0.4578	0.0607	0.5185	0.1306	0.0559	0.1864		1,510.5177	1,510.5177	0.0121		1,510.7710
Worker	0.5451	0.8300	7.4295	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5919		1,711.9609	1,711.9609	0.0771		1,713.5796
Total	**1.1585**	**4.0585**	**17.0039**	**0.0408**	**2.6362**	**0.0759**	**2.7121**	**0.7083**	**0.0700**	**0.7783**		**3,222.4786**	**3,222.4786**	**0.0891**		**3,224.3506**

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	lb/day										lb/day					
Off-Road	1.5661	14.3126	16.2093	0.0268		0.6967	0.6967		0.6557	0.6557		2,544.6262	2,544.6262	0.6044		2,557.3191
Total	**1.5661**	**14.3126**	**16.2093**	**0.0268**		**0.6967**	**0.6967**		**0.6557**	**0.6557**		**2,544.6262**	**2,544.6262**	**0.6044**		**2,557.3191**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5774	2.7231	9.2943	0.0161	0.4579	0.0592	0.5171	0.1306	0.0545	0.1851		1,506.5473	1,506.5473	0.0112		1,506.7819
Worker	0.5170	0.7800	6.9704	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,686.2234	1,686.2234	0.0738		1,687.7737
Total	**1.0943**	**3.5031**	**16.2646**	**0.0407**	**2.6363**	**0.0744**	**2.7106**	**0.7084**	**0.0685**	**0.7769**		**3,192.7708**	**3,192.7708**	**0.0850**		**3,194.5556**

3.5 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3867	15.2438	17.2686	0.0268		0.6493	0.6493		0.6192	0.6192	0.0000	2,544.6262	2,544.6262	0.6044		2,557.3191
Total	**1.3867**	**15.2438**	**17.2686**	**0.0268**		**0.6493**	**0.6493**		**0.6192**	**0.6192**	**0.0000**	**2,544.6262**	**2,544.6262**	**0.6044**		**2,557.3191**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5774	2.7231	9.2943	0.0161	0.4579	0.0592	0.5171	0.1306	0.0545	0.1851		1,506.5473	1,506.5473	0.0112		1,506.7819
Worker	0.5170	0.7800	6.9704	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,686.2234	1,686.2234	0.0738		1,687.7737
Total	**1.0943**	**3.5031**	**16.2646**	**0.0407**	**2.6363**	**0.0744**	**2.7106**	**0.7084**	**0.0685**	**0.7769**		**3,192.7708**	**3,192.7708**	**0.0850**		**3,194.5556**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4653	13.3774	16.1332	0.0268		0.6106	0.6106		0.5744	0.5744		2,545.1154	2,545.1154	0.6009		2,557.7349
Total	**1.4653**	**13.3774**	**16.1332**	**0.0268**		**0.6106**	**0.6106**		**0.5744**	**0.5744**		**2,545.1154**	**2,545.1154**	**0.6009**		**2,557.7349**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5537	2.6945	8.9706	0.0161	0.4580	0.0595	0.5175	0.1307	0.0548	0.1854		1,507.0894	1,507.0894	0.0112		1,507.3249
Worker	0.4913	0.7359	6.5792	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,663.0585	1,663.0585	0.0710		1,664.5485
Total	**1.0450**	**3.4304**	**15.5498**	**0.0407**	**2.6364**	**0.0747**	**2.7111**	**0.7084**	**0.0688**	**0.7773**		**3,170.1479**	**3,170.1479**	**0.0822**		**3,171.8734**

3.5 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3027	14.5750	17.2437	0.0268		0.5747	0.5747		0.5485	0.5485	0.0000	2,545.1154	2,545.1154	0.6009		2,557.7349
Total	**1.3027**	**14.5750**	**17.2437**	**0.0268**		**0.5747**	**0.5747**		**0.5485**	**0.5485**	**0.0000**	**2,545.1154**	**2,545.1154**	**0.6009**		**2,557.7349**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5537	2.6945	8.9706	0.0161	0.4580	0.0595	0.5175	0.1307	0.0548	0.1854		1,507.0894	1,507.0894	0.0112		1,507.3249
Worker	0.4913	0.7359	6.5792	0.0246	2.1784	0.0152	2.1936	0.5778	0.0141	0.5918		1,663.0585	1,663.0585	0.0710		1,664.5485
Total	**1.0450**	**3.4304**	**15.5498**	**0.0407**	**2.6364**	**0.0747**	**2.7111**	**0.7084**	**0.0688**	**0.7773**		**3,170.1479**	**3,170.1479**	**0.0822**		**3,171.8734**

3.6 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.0102
Total	**9.8822**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.0102**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1448	0.2262	2.0437	4.9000e-003	0.4338	3.1400e-003	0.4369	0.1151	2.9100e-003	0.1180		381.3503	381.3503	0.0194		381.7576
Total	**0.1448**	**0.2262**	**2.0437**	**4.9000e-003**	**0.4338**	**3.1400e-003**	**0.4369**	**0.1151**	**2.9100e-003**	**0.1180**		**381.3503**	**381.3503**	**0.0194**		**381.7576**

3.6 Architectural Coating - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506	0.0000	281.4485	281.4485	0.0267		282.0102
Total	**9.8822**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.0102**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1448	0.2262	2.0437	4.9000e-003	0.4338	3.1400e-003	0.4369	0.1151	2.9100e-003	0.1180		381.3503	381.3503	0.0194		381.7576
Total	**0.1448**	**0.2262**	**2.0437**	**4.9000e-003**	**0.4338**	**3.1400e-003**	**0.4369**	**0.1151**	**2.9100e-003**	**0.1180**		**381.3503**	**381.3503**	**0.0194**		**381.7576**

3.6 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		281.9473
Total	**9.8500**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**281.9473**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1312	0.2060	1.8468	4.9000e-003	0.4338	3.0800e-003	0.4369	0.1151	2.8500e-003	0.1179		367.5848	367.5848	0.0180		367.9634
Total	**0.1312**	**0.2060**	**1.8468**	**4.9000e-003**	**0.4338**	**3.0800e-003**	**0.4369**	**0.1151**	**2.8500e-003**	**0.1179**		**367.5848**	**367.5848**	**0.0180**		**367.9634**

3.6 Architectural Coating - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		281.9473
Total	**9.8500**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**281.9473**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1312	0.2060	1.8468	4.9000e-003	0.4338	3.0800e-003	0.4369	0.1151	2.8500e-003	0.1179		367.5848	367.5848	0.0180		367.9634
Total	**0.1312**	**0.2060**	**1.8468**	**4.9000e-003**	**0.4338**	**3.0800e-003**	**0.4369**	**0.1151**	**2.8500e-003**	**0.1179**		**367.5848**	**367.5848**	**0.0180**		**367.9634**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9057
Total	**9.8257**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9057**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1214	0.1894	1.6935	4.9000e-003	0.4338	3.0400e-003	0.4368	0.1151	2.8200e-003	0.1179		352.7602	352.7602	0.0169		353.1159
Total	**0.1214**	**0.1894**	**1.6935**	**4.9000e-003**	**0.4338**	**3.0400e-003**	**0.4368**	**0.1151**	**2.8200e-003**	**0.1179**		**352.7602**	**352.7602**	**0.0169**		**353.1159**

3.6 Architectural Coating - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9057
Total	**9.8257**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9057**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1214	0.1894	1.6935	4.9000e-003	0.4338	3.0400e-003	0.4368	0.1151	2.8200e-003	0.1179		352.7602	352.7602	0.0169		353.1159
Total	**0.1214**	**0.1894**	**1.6935**	**4.9000e-003**	**0.4338**	**3.0400e-003**	**0.4368**	**0.1151**	**2.8200e-003**	**0.1179**		**352.7602**	**352.7602**	**0.0169**		**353.1159**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.8537
Total	**9.8025**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.8537**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1146	0.1765	1.5804	4.9000e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		346.5604	346.5604	0.0161		346.8983
Total	**0.1146**	**0.1765**	**1.5804**	**4.9000e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**346.5604**	**346.5604**	**0.0161**		**346.8983**

3.6 Architectural Coating - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.8537
Total	**9.8025**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.8537**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1146	0.1765	1.5804	4.9000e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		346.5604	346.5604	0.0161		346.8983
Total	**0.1146**	**0.1765**	**1.5804**	**4.9000e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**346.5604**	**346.5604**	**0.0161**		**346.8983**

3.6 Architectural Coating - 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	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.8329
Total	**9.7881**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.8329**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1086	0.1653	1.4795	4.9000e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		340.9100	340.9100	0.0154		341.2323
Total	**0.1086**	**0.1653**	**1.4795**	**4.9000e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**340.9100**	**340.9100**	**0.0154**		**341.2323**

3.6 Architectural Coating - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.8329
Total	**9.7881**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.8329**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1086	0.1653	1.4795	4.9000e-003	0.4338	3.0300e-003	0.4368	0.1151	2.8100e-003	0.1179		340.9100	340.9100	0.0154		341.2323
Total	**0.1086**	**0.1653**	**1.4795**	**4.9000e-003**	**0.4338**	**3.0300e-003**	**0.4368**	**0.1151**	**2.8100e-003**	**0.1179**		**340.9100**	**340.9100**	**0.0154**		**341.2323**

3.6 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	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8017
Total	**9.7752**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8017**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1030	0.1553	1.3880	4.9000e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		335.7848	335.7848	0.0147		336.0935
Total	**0.1030**	**0.1553**	**1.3880**	**4.9000e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**335.7848**	**335.7848**	**0.0147**		**336.0935**

3.6 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8017
Total	**9.7752**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8017**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1030	0.1553	1.3880	4.9000e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		335.7848	335.7848	0.0147		336.0935
Total	**0.1030**	**0.1553**	**1.3880**	**4.9000e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**335.7848**	**335.7848**	**0.0147**		**336.0935**

3.6 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609		281.4481	281.4481	0.0159		281.7809
Total	**9.7643**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**		**281.4481**	**281.4481**	**0.0159**		**281.7809**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0978	0.1465	1.3101	4.8900e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		331.1718	331.1718	0.0141		331.4685
Total	**0.0978**	**0.1465**	**1.3101**	**4.8900e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**331.1718**	**331.1718**	**0.0141**		**331.4685**

3.6 Architectural Coating - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.5836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609	0.0000	281.4481	281.4481	0.0159		281.7809
Total	**9.7643**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**	**0.0000**	**281.4481**	**281.4481**	**0.0159**		**281.7809**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0978	0.1465	1.3101	4.8900e-003	0.4338	3.0200e-003	0.4368	0.1151	2.8000e-003	0.1179		331.1718	331.1718	0.0141		331.4685
Total	**0.0978**	**0.1465**	**1.3101**	**4.8900e-003**	**0.4338**	**3.0200e-003**	**0.4368**	**0.1151**	**2.8000e-003**	**0.1179**		**331.1718**	**331.1718**	**0.0141**		**331.4685**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	14.6283	25.8570	146.1227	0.3925	28.8363	0.4513	29.2876	7.6994	0.4167	8.1161		28,789.1641	28,789.1641	0.9828		28,809.8026
Unmitigated	14.6283	25.8570	146.1227	0.3925	28.8363	0.4513	29.2876	7.6994	0.4167	8.1161		28,789.1641	28,789.1641	0.9828		28,809.8026

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	6,102.32	6,102.32	6102.32	13,622,612	13,622,612
Total	6,102.32	6,102.32	6,102.32	13,622,612	13,622,612

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	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.527459	0.065504	0.176626	0.142970	0.035962	0.004781	0.010016	0.023598	0.001244	0.001463	0.006483	0.001857	0.002036

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.5290	4.5205	1.9236	0.0289		0.3655	0.3655		0.3655	0.3655		5,770.8460	5,770.8460	0.1106	0.1058	5,805.9665
NaturalGas Unmitigated	0.6682	5.7103	2.4299	0.0365		0.4617	0.4617		0.4617	0.4617		7,289.7268	7,289.7268	0.1397	0.1336	7,334.0909

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	61962.7	0.6682	5.7103	2.4299	0.0365		0.4617	0.4617		0.4617	0.4617		7,289.7268	7,289.7268	0.1397	0.1336	7,334.0909
Total		**0.6682**	**5.7103**	**2.4299**	**0.0365**		**0.4617**	**0.4617**		**0.4617**	**0.4617**		**7,289.7268**	**7,289.7268**	**0.1397**	**0.1336**	**7,334.0909**

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	lb/day										lb/day					
Single Family Housing	49.0522	0.5290	4.5205	1.9236	0.0289		0.3655	0.3655		0.3655	0.3655		5,770.8460	5,770.8460	0.1106	0.1058	5,805.9665
Total		**0.5290**	**4.5205**	**1.9236**	**0.0289**		**0.3655**	**0.3655**		**0.3655**	**0.3655**		**5,770.8460**	**5,770.8460**	**0.1106**	**0.1058**	**5,805.9665**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	30.3368	0.6091	52.9403	2.7900e-003		1.2960	1.2960		1.2854	1.2854	0.0000	15,931.6926	15,931.6926	0.3949	0.2903	16,029.9894
Unmitigated	1,179.2406	15.7792	1,443.6678	0.4662		195.0599	195.0599		195.0541	195.0541	20,227.7373	8,805.2809	29,033.0181	16.2446	1.6428	29,883.4069

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	4.4505					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	24.6913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1,148.5094	15.1701	1,390.8067	0.4634		194.7669	194.7669		194.7611	194.7611	20,227.7373	8,710.0588	28,937.7961	16.1532	1.6428	29,786.2662
Landscaping	1.5894	0.6091	52.8611	2.7900e-003		0.2930	0.2930		0.2930	0.2930		95.2220	95.2220	0.0914		97.1407
Total	**1,179.2406**	**15.7792**	**1,443.6678**	**0.4662**		**195.0599**	**195.0599**		**195.0541**	**195.0541**	**20,227.7373**	**8,805.2808**	**29,033.0181**	**16.2446**	**1.6428**	**29,883.4069**

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	lb/day										lb/day					
Architectural Coating	4.4505					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	22.8452					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.4517	7.0000e-005	0.0792	0.0000		1.0030	1.0030		0.9924	0.9924	0.0000	15,836.4706	15,836.4706	0.3035	0.2903	15,932.8487
Landscaping	1.5894	0.6091	52.8611	2.7900e-003		0.2930	0.2930		0.2930	0.2930		95.2220	95.2220	0.0914		97.1407
Total	**30.3368**	**0.6091**	**52.9403**	**2.7900e-003**		**1.2960**	**1.2960**		**1.2854**	**1.2854**	**0.0000**	**15,931.6926**	**15,931.6926**	**0.3949**	**0.2903**	**16,029.9894**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Vegetation

Vineyards at Sand Creek

Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	641.00	Dwelling Unit	141.00	1,153,800.00	1833

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - based on project description and traffic report assumptions

Construction Phase - based on information provided by the applicant

Grading - based on information from applicant

Architectural Coating -

Vehicle Trips - based on traffic report

Area Mitigation -

Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	220.00	1,695.00
tblConstructionPhase	NumDays	3,100.00	1,695.00
tblConstructionPhase	NumDays	310.00	130.00
tblConstructionPhase	NumDays	220.00	15.00
tblConstructionPhase	NumDays	120.00	45.00
tblConstructionPhase	PhaseEndDate	12/20/2030	7/5/2024
tblConstructionPhase	PhaseStartDate	6/22/2024	1/8/2018
tblConstructionPhase	PhaseStartDate	12/23/2017	12/25/2017
tblConstructionPhase	PhaseStartDate	6/3/2017	6/5/2017
tblConstructionPhase	PhaseStartDate	12/2/2017	12/4/2017
tblGrading	AcresOfGrading	325.00	141.00
tblLandUse	LotAcreage	208.12	141.00
tblProjectCharacteristics	OperationalYear	2014	2024
tblVehicleTrips	ST_TR	10.08	9.52
tblVehicleTrips	SU_TR	8.77	9.52
tblVehicleTrips	WD_TR	9.57	9.52

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.5373	5.9335	4.2231	5.4200e-003	0.8956	0.2910	1.1866	0.4528	0.2678	0.7206	0.0000	498.0933	498.0933	0.1464	0.0000	501.1668
2018	1.8126	4.1858	5.2168	9.8900e-003	0.3861	0.2274	0.6135	0.1039	0.2147	0.3185	0.0000	803.4829	803.4829	0.0940	0.0000	805.4558
2019	1.7757	3.7911	4.9780	9.9100e-003	0.3871	0.1968	0.5840	0.1041	0.1859	0.2900	0.0000	788.3677	788.3677	0.0914	0.0000	790.2874
2020	1.7349	3.4292	4.8010	9.9400e-003	0.3886	0.1716	0.5602	0.1045	0.1621	0.2666	0.0000	771.8634	771.8634	0.0897	0.0000	773.7472
2021	1.6868	3.0579	4.6187	9.9000e-003	0.3871	0.1473	0.5344	0.1041	0.1390	0.2432	0.0000	764.2528	764.2528	0.0877	0.0000	766.0935
2022	1.6464	2.7343	4.4623	9.8600e-003	0.3857	0.1256	0.5112	0.1037	0.1186	0.2223	0.0000	757.2555	757.2555	0.0862	0.0000	759.0662
2023	1.6190	2.4898	4.3480	9.8600e-003	0.3857	0.1098	0.4955	0.1038	0.1037	0.2074	0.0000	753.2093	753.2093	0.0850	0.0000	754.9943
2024	0.8176	1.1354	2.0585	4.7800e-003	0.1875	0.0471	0.2346	0.0504	0.0445	0.0949	0.0000	363.3830	363.3830	0.0406	0.0000	364.2346
Total	**11.6304**	**26.7569**	**34.7062**	**0.0696**	**3.4033**	**1.3167**	**4.7200**	**1.1274**	**1.2362**	**2.3635**	**0.0000**	**5,499.9079**	**5,499.9079**	**0.7208**	**0.0000**	**5,515.0458**

2.1 Overall Construction

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					
2017	0.5373	5.9335	4.2231	5.4200e-003	0.8956	0.2910	1.1866	0.4528	0.2678	0.7206	0.0000	498.0928	498.0928	0.1464	0.0000	501.1662
2018	1.8126	4.1858	5.2168	9.8900e-003	0.3861	0.2274	0.6135	0.1039	0.2147	0.3185	0.0000	803.4825	803.4825	0.0940	0.0000	805.4554
2019	1.7757	3.7911	4.9780	9.9100e-003	0.3871	0.1968	0.5840	0.1041	0.1859	0.2900	0.0000	788.3673	788.3673	0.0914	0.0000	790.2870
2020	1.7349	3.4292	4.8010	9.9400e-003	0.3886	0.1716	0.5602	0.1045	0.1621	0.2666	0.0000	771.8630	771.8630	0.0897	0.0000	773.7468
2021	1.6868	3.0579	4.6187	9.9000e-003	0.3871	0.1473	0.5344	0.1041	0.1390	0.2432	0.0000	764.2524	764.2524	0.0877	0.0000	766.0931
2022	1.6464	2.7343	4.4623	9.8600e-003	0.3857	0.1256	0.5112	0.1037	0.1186	0.2223	0.0000	757.2551	757.2551	0.0862	0.0000	759.0658
2023	1.6190	2.4898	4.3480	9.8600e-003	0.3857	0.1098	0.4955	0.1038	0.1037	0.2074	0.0000	753.2089	753.2089	0.0850	0.0000	754.9939
2024	0.8176	1.1354	2.0585	4.7800e-003	0.1875	0.0471	0.2346	0.0504	0.0445	0.0949	0.0000	363.3828	363.3828	0.0406	0.0000	364.2344
Total	**11.6304**	**26.7569**	**34.7062**	**0.0696**	**3.4033**	**1.3166**	**4.7200**	**1.1274**	**1.2362**	**2.3635**	**0.0000**	**5,499.9047**	**5,499.9047**	**0.7208**	**0.0000**	**5,515.0426**

	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**

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	9.2295	0.1256	10.5483	6.3300e-003		0.8700	0.8700		0.8700	0.8700	88.6569	32.6252	121.2821	0.1982	4.6900e-003	126.8974
Energy	0.1220	1.0421	0.4435	6.6500e-003		0.0843	0.0843		0.0843	0.0843	0.0000	2,525.8172	2,525.8172	0.0828	0.0345	2,538.2396
Mobile	2.5070	4.4799	23.9500	0.0720	5.0693	0.0819	5.1512	1.3574	0.0756	1.4330	0.0000	4,795.0019	4,795.0019	0.1619	0.0000	4,798.4025
Waste						0.0000	0.0000		0.0000	0.0000	156.2746	0.0000	156.2746	9.2356	0.0000	350.2215
Water						0.0000	0.0000		0.0000	0.0000	13.2497	92.5495	105.7992	1.3651	0.0330	144.6950
Total	**11.8584**	**5.6477**	**34.9417**	**0.0850**	**5.0693**	**1.0361**	**6.1055**	**1.3574**	**1.0299**	**2.3872**	**258.1812**	**7,445.9937**	**7,704.1750**	**11.0435**	**0.0722**	**7,958.4560**

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	5.1291	0.0548	4.7578	2.5000e-004		0.0295	0.0295		0.0295	0.0295	0.0000	52.9575	52.9575	8.3300e-003	8.3000e-004	53.3892
Energy	0.0965	0.8250	0.3511	5.2700e-003		0.0667	0.0667		0.0667	0.0667	0.0000	2,257.1654	2,257.1654	0.0772	0.0297	2,267.9913
Mobile	2.5070	4.4799	23.9500	0.0720	5.0693	0.0819	5.1512	1.3574	0.0756	1.4330	0.0000	4,795.0019	4,795.0019	0.1619	0.0000	4,798.4025
Waste						0.0000	0.0000		0.0000	0.0000	156.2746	0.0000	156.2746	9.2356	0.0000	350.2215
Water						0.0000	0.0000		0.0000	0.0000	13.2497	92.5495	105.7992	1.3648	0.0330	144.6739
Total	**7.7326**	**5.3597**	**29.0588**	**0.0776**	**5.0693**	**0.1781**	**5.2474**	**1.3574**	**0.1718**	**1.5292**	**169.5243**	**7,197.6743**	**7,367.1986**	**10.8478**	**0.0635**	**7,614.6783**

	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	**34.79**	**5.10**	**16.84**	**8.77**	**0.00**	**82.81**	**14.05**	**0.00**	**83.32**	**35.94**	**34.34**	**3.33**	**4.37**	**1.77**	**12.04**	**4.32**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/3/2017	6/2/2017	5	45	
2	Grading	Grading	6/5/2017	12/1/2017	5	130	
3	Paving	Paving	12/4/2017	12/22/2017	5	15	
4	Building Construction	Building Construction	12/25/2017	6/21/2024	5	1695	
5	Architectural Coating	Architectural Coating	1/8/2018	7/5/2024	5	1695	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 141

Acres of Paving: 0

Residential Indoor: 2,336,445; Residential Outdoor: 778,815; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Excavators	2	8.00	162	0.38
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	125	0.42
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	130	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Building Construction	Welders	1	8.00	46	0.45

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
Site Preparation	7	18.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	231.00	69.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	46.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4065	0.0000	0.4065	0.2234	0.0000	0.2234	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1089	1.1645	0.8864	8.8000e-004		0.0620	0.0620		0.0570	0.0570	0.0000	81.7096	81.7096	0.0250	0.0000	82.2354
Total	**0.1089**	**1.1645**	**0.8864**	**8.8000e-004**	**0.4065**	**0.0620**	**0.4685**	**0.2234**	**0.0570**	**0.2805**	**0.0000**	**81.7096**	**81.7096**	**0.0250**	**0.0000**	**82.2354**

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	1.3500e-003	2.0100e-003	0.0194	4.0000e-005	3.6900e-003	3.0000e-005	3.7200e-003	9.8000e-004	3.0000e-005	1.0100e-003	0.0000	3.2029	3.2029	1.7000e-004	0.0000	3.2064
Total	**1.3500e-003**	**2.0100e-003**	**0.0194**	**4.0000e-005**	**3.6900e-003**	**3.0000e-005**	**3.7200e-003**	**9.8000e-004**	**3.0000e-005**	**1.0100e-003**	**0.0000**	**3.2029**	**3.2029**	**1.7000e-004**	**0.0000**	**3.2064**

3.2 Site Preparation - 2017

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					0.4065	0.0000	0.4065	0.2234	0.0000	0.2234	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1089	1.1645	0.8864	8.8000e-004		0.0620	0.0620		0.0570	0.0570	0.0000	81.7095	81.7095	0.0250	0.0000	82.2353
Total	**0.1089**	**1.1645**	**0.8864**	**8.8000e-004**	**0.4065**	**0.0620**	**0.4685**	**0.2234**	**0.0570**	**0.2805**	**0.0000**	**81.7095**	**81.7095**	**0.0250**	**0.0000**	**82.2353**

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	1.3500e-003	2.0100e-003	0.0194	4.0000e-005	3.6900e-003	3.0000e-005	3.7200e-003	9.8000e-004	3.0000e-005	1.0100e-003	0.0000	3.2029	3.2029	1.7000e-004	0.0000	3.2064
Total	**1.3500e-003**	**2.0100e-003**	**0.0194**	**4.0000e-005**	**3.6900e-003**	**3.0000e-005**	**3.7200e-003**	**9.8000e-004**	**3.0000e-005**	**1.0100e-003**	**0.0000**	**3.2029**	**3.2029**	**1.7000e-004**	**0.0000**	**3.2064**

3.3 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4662	0.0000	0.4662	0.2232	0.0000	0.2232	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3964	4.5235	3.0423	4.0100e-003		0.2156	0.2156		0.1984	0.1984	0.0000	372.2805	372.2805	0.1141	0.0000	374.6759
Total	**0.3964**	**4.5235**	**3.0423**	**4.0100e-003**	**0.4662**	**0.2156**	**0.6818**	**0.2232**	**0.1984**	**0.4216**	**0.0000**	**372.2805**	**372.2805**	**0.1141**	**0.0000**	**374.6759**

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	4.3300e-003	6.4400e-003	0.0624	1.4000e-004	0.0118	9.0000e-005	0.0119	3.1500e-003	8.0000e-005	3.2300e-003	0.0000	10.2809	10.2809	5.4000e-004	0.0000	10.2923
Total	**4.3300e-003**	**6.4400e-003**	**0.0624**	**1.4000e-004**	**0.0118**	**9.0000e-005**	**0.0119**	**3.1500e-003**	**8.0000e-005**	**3.2300e-003**	**0.0000**	**10.2809**	**10.2809**	**5.4000e-004**	**0.0000**	**10.2923**

3.3 Grading - 2017

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					0.4662	0.0000	0.4662	0.2232	0.0000	0.2232	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3964	4.5235	3.0423	4.0100e-003		0.2156	0.2156		0.1984	0.1984	0.0000	372.2800	372.2800	0.1141	0.0000	374.6754
Total	**0.3964**	**4.5235**	**3.0423**	**4.0100e-003**	**0.4662**	**0.2156**	**0.6818**	**0.2232**	**0.1984**	**0.4216**	**0.0000**	**372.2800**	**372.2800**	**0.1141**	**0.0000**	**374.6754**

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	4.3300e-003	6.4400e-003	0.0624	1.4000e-004	0.0118	9.0000e-005	0.0119	3.1500e-003	8.0000e-005	3.2300e-003	0.0000	10.2809	10.2809	5.4000e-004	0.0000	10.2923
Total	**4.3300e-003**	**6.4400e-003**	**0.0624**	**1.4000e-004**	**0.0118**	**9.0000e-005**	**0.0119**	**3.1500e-003**	**8.0000e-005**	**3.2300e-003**	**0.0000**	**10.2809**	**10.2809**	**5.4000e-004**	**0.0000**	**10.2923**

3.4 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0143	0.1522	0.1105	1.7000e-004		8.5400e-003	8.5400e-003		7.8500e-003	7.8500e-003	0.0000	15.5201	15.5201	4.7600e-003	0.0000	15.6199
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0143**	**0.1522**	**0.1105**	**1.7000e-004**		**8.5400e-003**	**8.5400e-003**		**7.8500e-003**	**7.8500e-003**	**0.0000**	**15.5201**	**15.5201**	**4.7600e-003**	**0.0000**	**15.6199**

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	3.7000e-004	5.6000e-004	5.4000e-003	1.0000e-005	1.0200e-003	1.0000e-005	1.0300e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.8897	0.8897	5.0000e-005	0.0000	0.8907
Total	**3.7000e-004**	**5.6000e-004**	**5.4000e-003**	**1.0000e-005**	**1.0200e-003**	**1.0000e-005**	**1.0300e-003**	**2.7000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.8897**	**0.8897**	**5.0000e-005**	**0.0000**	**0.8907**

3.4 Paving - 2017

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	0.0143	0.1522	0.1105	1.7000e-004		8.5400e-003	8.5400e-003		7.8500e-003	7.8500e-003	0.0000	15.5200	15.5200	4.7600e-003	0.0000	15.6199
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0143**	**0.1522**	**0.1105**	**1.7000e-004**		**8.5400e-003**	**8.5400e-003**		**7.8500e-003**	**7.8500e-003**	**0.0000**	**15.5200**	**15.5200**	**4.7600e-003**	**0.0000**	**15.6199**

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	3.7000e-004	5.6000e-004	5.4000e-003	1.0000e-005	1.0200e-003	1.0000e-005	1.0300e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.8897	0.8897	5.0000e-005	0.0000	0.8907
Total	**3.7000e-004**	**5.6000e-004**	**5.4000e-003**	**1.0000e-005**	**1.0200e-003**	**1.0000e-005**	**1.0300e-003**	**2.7000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.8897**	**0.8897**	**5.0000e-005**	**0.0000**	**0.8907**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.7600e-003	0.0660	0.0453	7.0000e-005		4.4500e-003	4.4500e-003		4.1800e-003	4.1800e-003	0.0000	5.9870	5.9870	1.4700e-003	0.0000	6.0179
Total	**7.7600e-003**	**0.0660**	**0.0453**	**7.0000e-005**		**4.4500e-003**	**4.4500e-003**		**4.1800e-003**	**4.1800e-003**	**0.0000**	**5.9870**	**5.9870**	**1.4700e-003**	**0.0000**	**6.0179**

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	2.0000e-003	0.0155	0.0236	4.0000e-005	1.1100e-003	2.2000e-004	1.3300e-003	3.2000e-004	2.0000e-004	5.2000e-004	0.0000	3.6556	3.6556	3.0000e-005	0.0000	3.6562
Worker	1.9200e-003	2.8600e-003	0.0277	6.0000e-005	5.2600e-003	4.0000e-005	5.3000e-003	1.4000e-003	4.0000e-005	1.4400e-003	0.0000	4.5671	4.5671	2.4000e-004	0.0000	4.5721
Total	**3.9200e-003**	**0.0184**	**0.0513**	**1.0000e-004**	**6.3700e-003**	**2.6000e-004**	**6.6300e-003**	**1.7200e-003**	**2.4000e-004**	**1.9600e-003**	**0.0000**	**8.2227**	**8.2227**	**2.7000e-004**	**0.0000**	**8.2283**

3.5 Building Construction - 2017

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	7.7600e-003	0.0660	0.0453	7.0000e-005		4.4500e-003	4.4500e-003		4.1800e-003	4.1800e-003	0.0000	5.9870	5.9870	1.4700e-003	0.0000	6.0179
Total	**7.7600e-003**	**0.0660**	**0.0453**	**7.0000e-005**		**4.4500e-003**	**4.4500e-003**		**4.1800e-003**	**4.1800e-003**	**0.0000**	**5.9870**	**5.9870**	**1.4700e-003**	**0.0000**	**6.0179**

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	2.0000e-003	0.0155	0.0236	4.0000e-005	1.1100e-003	2.2000e-004	1.3300e-003	3.2000e-004	2.0000e-004	5.2000e-004	0.0000	3.6556	3.6556	3.0000e-005	0.0000	3.6562
Worker	1.9200e-003	2.8600e-003	0.0277	6.0000e-005	5.2600e-003	4.0000e-005	5.3000e-003	1.4000e-003	4.0000e-005	1.4400e-003	0.0000	4.5671	4.5671	2.4000e-004	0.0000	4.5721
Total	**3.9200e-003**	**0.0184**	**0.0513**	**1.0000e-004**	**6.3700e-003**	**2.6000e-004**	**6.6300e-003**	**1.7200e-003**	**2.4000e-004**	**1.9600e-003**	**0.0000**	**8.2227**	**8.2227**	**2.7000e-004**	**0.0000**	**8.2283**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9844	308.9844	0.0756	0.0000	310.5723
Total	**0.3483**	**3.0355**	**2.2880**	**3.5000e-003**		**0.1950**	**0.1950**		**0.1833**	**0.1833**	**0.0000**	**308.9844**	**308.9844**	**0.0756**	**0.0000**	**310.5723**

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	0.0925	0.7327	1.1451	2.1300e-003	0.0580	0.0107	0.0687	0.0166	9.8200e-003	0.0264	0.0000	187.4571	187.4571	1.4500e-003	0.0000	187.4875
Worker	0.0894	0.1345	1.2937	3.2500e-003	0.2745	2.0600e-003	0.2765	0.0730	1.9000e-003	0.0749	0.0000	229.5283	229.5283	0.0115	0.0000	229.7705
Total	**0.1819**	**0.8672**	**2.4388**	**5.3800e-003**	**0.3325**	**0.0127**	**0.3452**	**0.0896**	**0.0117**	**0.1013**	**0.0000**	**416.9854**	**416.9854**	**0.0130**	**0.0000**	**417.2579**

3.5 Building Construction - 2018

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	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9841	308.9841	0.0756	0.0000	310.5720
Total	**0.3483**	**3.0355**	**2.2880**	**3.5000e-003**		**0.1950**	**0.1950**		**0.1833**	**0.1833**	**0.0000**	**308.9841**	**308.9841**	**0.0756**	**0.0000**	**310.5720**

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	0.0925	0.7327	1.1451	2.1300e-003	0.0580	0.0107	0.0687	0.0166	9.8200e-003	0.0264	0.0000	187.4571	187.4571	1.4500e-003	0.0000	187.4875
Worker	0.0894	0.1345	1.2937	3.2500e-003	0.2745	2.0600e-003	0.2765	0.0730	1.9000e-003	0.0749	0.0000	229.5283	229.5283	0.0115	0.0000	229.7705
Total	**0.1819**	**0.8672**	**2.4388**	**5.3800e-003**	**0.3325**	**0.0127**	**0.3452**	**0.0896**	**0.0117**	**0.1013**	**0.0000**	**416.9854**	**416.9854**	**0.0130**	**0.0000**	**417.2579**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3069	2.7359	2.2342	3.5000e-003		0.1677	0.1677		0.1577	0.1577	0.0000	305.5302	305.5302	0.0743	0.0000	307.0913
Total	**0.3069**	**2.7359**	**2.2342**	**3.5000e-003**		**0.1677**	**0.1677**		**0.1577**	**0.1577**	**0.0000**	**305.5302**	**305.5302**	**0.0743**	**0.0000**	**307.0913**

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	0.0860	0.6688	1.0968	2.1300e-003	0.0580	9.9200e-003	0.0679	0.0166	9.1300e-003	0.0257	0.0000	184.2135	184.2135	1.4100e-003	0.0000	184.2432
Worker	0.0812	0.1225	1.1731	3.2500e-003	0.2745	2.0200e-003	0.2765	0.0730	1.8700e-003	0.0749	0.0000	221.2463	221.2463	0.0107	0.0000	221.4714
Total	**0.1672**	**0.7912**	**2.2699**	**5.3800e-003**	**0.3325**	**0.0119**	**0.3444**	**0.0896**	**0.0110**	**0.1006**	**0.0000**	**405.4598**	**405.4598**	**0.0121**	**0.0000**	**405.7146**

3.5 Building Construction - 2019

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	0.3069	2.7359	2.2342	3.5000e-003		0.1677	0.1677		0.1577	0.1577	0.0000	305.5299	305.5299	0.0743	0.0000	307.0909
Total	**0.3069**	**2.7359**	**2.2342**	**3.5000e-003**		**0.1677**	**0.1677**		**0.1577**	**0.1577**	**0.0000**	**305.5299**	**305.5299**	**0.0743**	**0.0000**	**307.0909**

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	0.0860	0.6688	1.0968	2.1300e-003	0.0580	9.9200e-003	0.0679	0.0166	9.1300e-003	0.0257	0.0000	184.2135	184.2135	1.4100e-003	0.0000	184.2432
Worker	0.0812	0.1225	1.1731	3.2500e-003	0.2745	2.0200e-003	0.2765	0.0730	1.8700e-003	0.0749	0.0000	221.2463	221.2463	0.0107	0.0000	221.4714
Total	**0.1672**	**0.7912**	**2.2699**	**5.3800e-003**	**0.3325**	**0.0119**	**0.3444**	**0.0896**	**0.0110**	**0.1006**	**0.0000**	**405.4598**	**405.4598**	**0.0121**	**0.0000**	**405.7146**

3.5 Building Construction - 2020

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	0.2766	2.5000	2.2019	3.5100e-003		0.1458	0.1458		0.1371	0.1371	0.0000	302.1514	302.1514	0.0736	0.0000	303.6973
Total	**0.2766**	**2.5000**	**2.2019**	**3.5100e-003**		**0.1458**	**0.1458**		**0.1371**	**0.1371**	**0.0000**	**302.1514**	**302.1514**	**0.0736**	**0.0000**	**303.6973**

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	0.0806	0.5731	1.0616	2.1300e-003	0.0582	8.9200e-003	0.0671	0.0167	8.2000e-003	0.0249	0.0000	180.6811	180.6811	1.3800e-003	0.0000	180.7101
Worker	0.0755	0.1131	1.0821	3.2600e-003	0.2755	2.0000e-003	0.2775	0.0733	1.8500e-003	0.0751	0.0000	213.1399	213.1399	0.0101	0.0000	213.3522
Total	**0.1561**	**0.6861**	**2.1437**	**5.3900e-003**	**0.3337**	**0.0109**	**0.3446**	**0.0899**	**0.0101**	**0.1000**	**0.0000**	**393.8210**	**393.8210**	**0.0115**	**0.0000**	**394.0622**

3.5 Building Construction - 2020

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	0.2766	2.5000	2.2019	3.5100e-003		0.1458	0.1458		0.1371	0.1371	0.0000	302.1510	302.1510	0.0736	0.0000	303.6969
Total	**0.2766**	**2.5000**	**2.2019**	**3.5100e-003**		**0.1458**	**0.1458**		**0.1371**	**0.1371**	**0.0000**	**302.1510**	**302.1510**	**0.0736**	**0.0000**	**303.6969**

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	0.0806	0.5731	1.0616	2.1300e-003	0.0582	8.9200e-003	0.0671	0.0167	8.2000e-003	0.0249	0.0000	180.6811	180.6811	1.3800e-003	0.0000	180.7101
Worker	0.0755	0.1131	1.0821	3.2600e-003	0.2755	2.0000e-003	0.2775	0.0733	1.8500e-003	0.0751	0.0000	213.1399	213.1399	0.0101	0.0000	213.3522
Total	**0.1561**	**0.6861**	**2.1437**	**5.3900e-003**	**0.3337**	**0.0109**	**0.3446**	**0.0899**	**0.0101**	**0.1000**	**0.0000**	**393.8210**	**393.8210**	**0.0115**	**0.0000**	**394.0622**

3.5 Building Construction - 2021

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	0.2471	2.2629	2.1582	3.5000e-003		0.1246	0.1246		0.1172	0.1172	0.0000	301.0339	301.0339	0.0725	0.0000	302.5568
Total	**0.2471**	**2.2629**	**2.1582**	**3.5000e-003**		**0.1246**	**0.1246**		**0.1172**	**0.1172**	**0.0000**	**301.0339**	**301.0339**	**0.0725**	**0.0000**	**302.5568**

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	0.0754	0.4699	1.0155	2.1200e-003	0.0580	8.0000e-003	0.0660	0.0166	7.3600e-003	0.0240	0.0000	179.7630	179.7630	1.3700e-003	0.0000	179.7919
Worker	0.0711	0.1050	1.0073	3.2500e-003	0.2745	1.9900e-003	0.2765	0.0730	1.8400e-003	0.0748	0.0000	208.5971	208.5971	9.5600e-003	0.0000	208.7980
Total	**0.1464**	**0.5749**	**2.0228**	**5.3700e-003**	**0.3325**	**9.9900e-003**	**0.3425**	**0.0896**	**9.2000e-003**	**0.0988**	**0.0000**	**388.3602**	**388.3602**	**0.0109**	**0.0000**	**388.5898**

3.5 Building Construction - 2021

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	0.2471	2.2629	2.1582	3.5000e-003		0.1246	0.1246		0.1172	0.1172	0.0000	301.0335	301.0335	0.0725	0.0000	302.5565
Total	**0.2471**	**2.2629**	**2.1582**	**3.5000e-003**		**0.1246**	**0.1246**		**0.1172**	**0.1172**	**0.0000**	**301.0335**	**301.0335**	**0.0725**	**0.0000**	**302.5565**

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	0.0754	0.4699	1.0155	2.1200e-003	0.0580	8.0000e-003	0.0660	0.0166	7.3600e-003	0.0240	0.0000	179.7630	179.7630	1.3700e-003	0.0000	179.7919
Worker	0.0711	0.1050	1.0073	3.2500e-003	0.2745	1.9900e-003	0.2765	0.0730	1.8400e-003	0.0748	0.0000	208.5971	208.5971	9.5600e-003	0.0000	208.7980
Total	**0.1464**	**0.5749**	**2.0228**	**5.3700e-003**	**0.3325**	**9.9900e-003**	**0.3425**	**0.0896**	**9.2000e-003**	**0.0988**	**0.0000**	**388.3602**	**388.3602**	**0.0109**	**0.0000**	**388.5898**

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	0.2209	2.0197	2.1226	3.4900e-003		0.1047	0.1047		0.0986	0.0986	0.0000	299.9946	299.9946	0.0718	0.0000	301.5017
Total	**0.2209**	**2.0197**	**2.1226**	**3.4900e-003**		**0.1047**	**0.1047**		**0.0986**	**0.0986**	**0.0000**	**299.9946**	**299.9946**	**0.0718**	**0.0000**	**301.5017**

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	0.0726	0.4141	0.9761	2.1100e-003	0.0578	7.8500e-003	0.0656	0.0166	7.2300e-003	0.0238	0.0000	178.9507	178.9507	1.4000e-003	0.0000	178.9800
Worker	0.0671	0.0979	0.9405	3.2400e-003	0.2734	1.9700e-003	0.2754	0.0727	1.8300e-003	0.0745	0.0000	204.4124	204.4124	9.0900e-003	0.0000	204.6033
Total	**0.1397**	**0.5120**	**1.9166**	**5.3500e-003**	**0.3312**	**9.8200e-003**	**0.3410**	**0.0893**	**9.0600e-003**	**0.0983**	**0.0000**	**383.3631**	**383.3631**	**0.0105**	**0.0000**	**383.5833**

3.5 Building Construction - 2022

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	0.2209	2.0197	2.1226	3.4900e-003		0.1047	0.1047		0.0986	0.0986	0.0000	299.9943	299.9943	0.0718	0.0000	301.5013
Total	**0.2209**	**2.0197**	**2.1226**	**3.4900e-003**		**0.1047**	**0.1047**		**0.0986**	**0.0986**	**0.0000**	**299.9943**	**299.9943**	**0.0718**	**0.0000**	**301.5013**

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	0.0726	0.4141	0.9761	2.1100e-003	0.0578	7.8500e-003	0.0656	0.0166	7.2300e-003	0.0238	0.0000	178.9507	178.9507	1.4000e-003	0.0000	178.9800
Worker	0.0671	0.0979	0.9405	3.2400e-003	0.2734	1.9700e-003	0.2754	0.0727	1.8300e-003	0.0745	0.0000	204.4124	204.4124	9.0900e-003	0.0000	204.6033
Total	**0.1397**	**0.5120**	**1.9166**	**5.3500e-003**	**0.3312**	**9.8200e-003**	**0.3410**	**0.0893**	**9.0600e-003**	**0.0983**	**0.0000**	**383.3631**	**383.3631**	**0.0105**	**0.0000**	**383.5833**

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	0.2036	1.8606	2.1072	3.4900e-003		0.0906	0.0906		0.0852	0.0852	0.0000	300.0980	300.0980	0.0713	0.0000	301.5949
Total	**0.2036**	**1.8606**	**2.1072**	**3.4900e-003**		**0.0906**	**0.0906**		**0.0852**	**0.0852**	**0.0000**	**300.0980**	**300.0980**	**0.0713**	**0.0000**	**301.5949**

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	0.0683	0.3494	0.9457	2.1000e-003	0.0578	7.6600e-003	0.0655	0.0166	7.0500e-003	0.0236	0.0000	178.4829	178.4829	1.2900e-003	0.0000	178.5100
Worker	0.0636	0.0920	0.8836	3.2400e-003	0.2734	1.9700e-003	0.2754	0.0727	1.8300e-003	0.0745	0.0000	201.3420	201.3420	8.7100e-003	0.0000	201.5249
Total	**0.1319**	**0.4415**	**1.8294**	**5.3400e-003**	**0.3312**	**9.6300e-003**	**0.3409**	**0.0893**	**8.8800e-003**	**0.0981**	**0.0000**	**379.8249**	**379.8249**	**0.0100**	**0.0000**	**380.0349**

3.5 Building Construction - 2023

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	0.2036	1.8606	2.1072	3.4900e-003		0.0906	0.0906		0.0852	0.0852	0.0000	300.0976	300.0976	0.0713	0.0000	301.5946
Total	**0.2036**	**1.8606**	**2.1072**	**3.4900e-003**		**0.0906**	**0.0906**		**0.0852**	**0.0852**	**0.0000**	**300.0976**	**300.0976**	**0.0713**	**0.0000**	**301.5946**

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	0.0683	0.3494	0.9457	2.1000e-003	0.0578	7.6600e-003	0.0655	0.0166	7.0500e-003	0.0236	0.0000	178.4829	178.4829	1.2900e-003	0.0000	178.5100
Worker	0.0636	0.0920	0.8836	3.2400e-003	0.2734	1.9700e-003	0.2754	0.0727	1.8300e-003	0.0745	0.0000	201.3420	201.3420	8.7100e-003	0.0000	201.5249
Total	**0.1319**	**0.4415**	**1.8294**	**5.3400e-003**	**0.3312**	**9.6300e-003**	**0.3409**	**0.0893**	**8.8800e-003**	**0.0981**	**0.0000**	**379.8249**	**379.8249**	**0.0100**	**0.0000**	**380.0349**

3.5 Building Construction - 2024

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	0.0916	0.8361	1.0083	1.6800e-003		0.0382	0.0382		0.0359	0.0359	0.0000	144.3056	144.3056	0.0341	0.0000	145.0211
Total	**0.0916**	**0.8361**	**1.0083**	**1.6800e-003**		**0.0382**	**0.0382**		**0.0359**	**0.0359**	**0.0000**	**144.3056**	**144.3056**	**0.0341**	**0.0000**	**145.0211**

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	0.0316	0.1663	0.4402	1.0100e-003	0.0278	3.7000e-003	0.0315	7.9600e-003	3.4100e-003	0.0114	0.0000	85.8398	85.8398	6.2000e-004	0.0000	85.8529
Worker	0.0291	0.0418	0.4015	1.5600e-003	0.1315	9.5000e-004	0.1324	0.0350	8.8000e-004	0.0358	0.0000	95.4707	95.4707	4.0200e-003	0.0000	95.5551
Total	**0.0607**	**0.2081**	**0.8416**	**2.5700e-003**	**0.1593**	**4.6500e-003**	**0.1639**	**0.0429**	**4.2900e-003**	**0.0472**	**0.0000**	**181.3105**	**181.3105**	**4.6400e-003**	**0.0000**	**181.4081**

3.5 Building Construction - 2024

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	0.0916	0.8361	1.0083	1.6800e-003		0.0382	0.0382		0.0359	0.0359	0.0000	144.3055	144.3055	0.0341	0.0000	145.0210
Total	**0.0916**	**0.8361**	**1.0083**	**1.6800e-003**		**0.0382**	**0.0382**		**0.0359**	**0.0359**	**0.0000**	**144.3055**	**144.3055**	**0.0341**	**0.0000**	**145.0210**

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	0.0316	0.1663	0.4402	1.0100e-003	0.0278	3.7000e-003	0.0315	7.9600e-003	3.4100e-003	0.0114	0.0000	85.8398	85.8398	6.2000e-004	0.0000	85.8529
Worker	0.0291	0.0418	0.4015	1.5600e-003	0.1315	9.5000e-004	0.1324	0.0350	8.8000e-004	0.0358	0.0000	95.4707	95.4707	4.0200e-003	0.0000	95.5551
Total	**0.0607**	**0.2081**	**0.8416**	**2.5700e-003**	**0.1593**	**4.6500e-003**	**0.1639**	**0.0429**	**4.2900e-003**	**0.0472**	**0.0000**	**181.3105**	**181.3105**	**4.6400e-003**	**0.0000**	**181.4081**

3.6 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.2267					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0382	0.2567	0.2373	3.8000e-004		0.0193	0.0193		0.0193	0.0193	0.0000	32.6817	32.6817	3.1100e-003	0.0000	32.7469
Total	**1.2649**	**0.2567**	**0.2373**	**3.8000e-004**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**32.6817**	**32.6817**	**3.1100e-003**	**0.0000**	**32.7469**

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	0.0175	0.0263	0.2527	6.3000e-004	0.0536	4.0000e-004	0.0540	0.0143	3.7000e-004	0.0146	0.0000	44.8313	44.8313	2.2500e-003	0.0000	44.8786
Total	**0.0175**	**0.0263**	**0.2527**	**6.3000e-004**	**0.0536**	**4.0000e-004**	**0.0540**	**0.0143**	**3.7000e-004**	**0.0146**	**0.0000**	**44.8313**	**44.8313**	**2.2500e-003**	**0.0000**	**44.8786**

3.6 Architectural Coating - 2018

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	1.2267					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0382	0.2567	0.2373	3.8000e-004		0.0193	0.0193		0.0193	0.0193	0.0000	32.6817	32.6817	3.1100e-003	0.0000	32.7469
Total	**1.2649**	**0.2567**	**0.2373**	**3.8000e-004**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**32.6817**	**32.6817**	**3.1100e-003**	**0.0000**	**32.7469**

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	0.0175	0.0263	0.2527	6.3000e-004	0.0536	4.0000e-004	0.0540	0.0143	3.7000e-004	0.0146	0.0000	44.8313	44.8313	2.2500e-003	0.0000	44.8786
Total	**0.0175**	**0.0263**	**0.2527**	**6.3000e-004**	**0.0536**	**4.0000e-004**	**0.0540**	**0.0143**	**3.7000e-004**	**0.0146**	**0.0000**	**44.8313**	**44.8313**	**2.2500e-003**	**0.0000**	**44.8786**

3.6 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.2507					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0348	0.2395	0.2403	3.9000e-004		0.0168	0.0168		0.0168	0.0168	0.0000	33.3200	33.3200	2.8100e-003	0.0000	33.3791
Total	**1.2854**	**0.2395**	**0.2403**	**3.9000e-004**		**0.0168**	**0.0168**		**0.0168**	**0.0168**	**0.0000**	**33.3200**	**33.3200**	**2.8100e-003**	**0.0000**	**33.3791**

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	0.0162	0.0244	0.2336	6.5000e-004	0.0547	4.0000e-004	0.0551	0.0145	3.7000e-004	0.0149	0.0000	44.0577	44.0577	2.1300e-003	0.0000	44.1025
Total	**0.0162**	**0.0244**	**0.2336**	**6.5000e-004**	**0.0547**	**4.0000e-004**	**0.0551**	**0.0145**	**3.7000e-004**	**0.0149**	**0.0000**	**44.0577**	**44.0577**	**2.1300e-003**	**0.0000**	**44.1025**

3.6 Architectural Coating - 2019

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	1.2507					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0348	0.2395	0.2403	3.9000e-004		0.0168	0.0168		0.0168	0.0168	0.0000	33.3199	33.3199	2.8100e-003	0.0000	33.3790
Total	**1.2854**	**0.2395**	**0.2403**	**3.9000e-004**		**0.0168**	**0.0168**		**0.0168**	**0.0168**	**0.0000**	**33.3199**	**33.3199**	**2.8100e-003**	**0.0000**	**33.3790**

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	0.0162	0.0244	0.2336	6.5000e-004	0.0547	4.0000e-004	0.0551	0.0145	3.7000e-004	0.0149	0.0000	44.0577	44.0577	2.1300e-003	0.0000	44.1025
Total	**0.0162**	**0.0244**	**0.2336**	**6.5000e-004**	**0.0547**	**4.0000e-004**	**0.0551**	**0.0145**	**3.7000e-004**	**0.0149**	**0.0000**	**44.0577**	**44.0577**	**2.1300e-003**	**0.0000**	**44.1025**

3.6 Architectural Coating - 2020

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	1.2555					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0317	0.2206	0.2399	3.9000e-004		0.0145	0.0145		0.0145	0.0145	0.0000	33.4476	33.4476	2.5900e-003	0.0000	33.5020
Total	**1.2872**	**0.2206**	**0.2399**	**3.9000e-004**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**33.4476**	**33.4476**	**2.5900e-003**	**0.0000**	**33.5020**

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	0.0150	0.0225	0.2155	6.5000e-004	0.0549	4.0000e-004	0.0553	0.0146	3.7000e-004	0.0150	0.0000	42.4434	42.4434	2.0100e-003	0.0000	42.4857
Total	**0.0150**	**0.0225**	**0.2155**	**6.5000e-004**	**0.0549**	**4.0000e-004**	**0.0553**	**0.0146**	**3.7000e-004**	**0.0150**	**0.0000**	**42.4434**	**42.4434**	**2.0100e-003**	**0.0000**	**42.4857**

3.6 Architectural Coating - 2020

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	1.2555					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0317	0.2206	0.2399	3.9000e-004		0.0145	0.0145		0.0145	0.0145	0.0000	33.4476	33.4476	2.5900e-003	0.0000	33.5020
Total	**1.2872**	**0.2206**	**0.2399**	**3.9000e-004**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**33.4476**	**33.4476**	**2.5900e-003**	**0.0000**	**33.5020**

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	0.0150	0.0225	0.2155	6.5000e-004	0.0549	4.0000e-004	0.0553	0.0146	3.7000e-004	0.0150	0.0000	42.4434	42.4434	2.0100e-003	0.0000	42.4857
Total	**0.0150**	**0.0225**	**0.2155**	**6.5000e-004**	**0.0549**	**4.0000e-004**	**0.0553**	**0.0146**	**3.7000e-004**	**0.0150**	**0.0000**	**42.4434**	**42.4434**	**2.0100e-003**	**0.0000**	**42.4857**

3.6 Architectural Coating - 2021

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	1.2507					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0286	0.1993	0.2372	3.9000e-004		0.0123	0.0123		0.0123	0.0123	0.0000	33.3200	33.3200	2.2900e-003	0.0000	33.3680
Total	**1.2792**	**0.1993**	**0.2372**	**3.9000e-004**		**0.0123**	**0.0123**		**0.0123**	**0.0123**	**0.0000**	**33.3200**	**33.3200**	**2.2900e-003**	**0.0000**	**33.3680**

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	0.0142	0.0209	0.2006	6.5000e-004	0.0547	4.0000e-004	0.0551	0.0145	3.7000e-004	0.0149	0.0000	41.5388	41.5388	1.9000e-003	0.0000	41.5788
Total	**0.0142**	**0.0209**	**0.2006**	**6.5000e-004**	**0.0547**	**4.0000e-004**	**0.0551**	**0.0145**	**3.7000e-004**	**0.0149**	**0.0000**	**41.5388**	**41.5388**	**1.9000e-003**	**0.0000**	**41.5788**

3.6 Architectural Coating - 2021

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	1.2507					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0286	0.1993	0.2372	3.9000e-004		0.0123	0.0123		0.0123	0.0123	0.0000	33.3199	33.3199	2.2900e-003	0.0000	33.3679
Total	**1.2792**	**0.1993**	**0.2372**	**3.9000e-004**		**0.0123**	**0.0123**		**0.0123**	**0.0123**	**0.0000**	**33.3199**	**33.3199**	**2.2900e-003**	**0.0000**	**33.3679**

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	0.0142	0.0209	0.2006	6.5000e-004	0.0547	4.0000e-004	0.0551	0.0145	3.7000e-004	0.0149	0.0000	41.5388	41.5388	1.9000e-003	0.0000	41.5788
Total	**0.0142**	**0.0209**	**0.2006**	**6.5000e-004**	**0.0547**	**4.0000e-004**	**0.0551**	**0.0145**	**3.7000e-004**	**0.0149**	**0.0000**	**41.5388**	**41.5388**	**1.9000e-003**	**0.0000**	**41.5788**

3.6 Architectural Coating - 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					
Archit. Coating	1.2459					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0266	0.1831	0.2358	3.9000e-004		0.0106	0.0106		0.0106	0.0106	0.0000	33.1923	33.1923	2.1600e-003	0.0000	33.2377
Total	**1.2725**	**0.1831**	**0.2358**	**3.9000e-004**		**0.0106**	**0.0106**		**0.0106**	**0.0106**	**0.0000**	**33.1923**	**33.1923**	**2.1600e-003**	**0.0000**	**33.2377**

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	0.0134	0.0195	0.1873	6.4000e-004	0.0545	3.9000e-004	0.0548	0.0145	3.6000e-004	0.0148	0.0000	40.7055	40.7055	1.8100e-003	0.0000	40.7435
Total	**0.0134**	**0.0195**	**0.1873**	**6.4000e-004**	**0.0545**	**3.9000e-004**	**0.0548**	**0.0145**	**3.6000e-004**	**0.0148**	**0.0000**	**40.7055**	**40.7055**	**1.8100e-003**	**0.0000**	**40.7435**

3.6 Architectural Coating - 2022

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	1.2459					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0266	0.1831	0.2358	3.9000e-004		0.0106	0.0106		0.0106	0.0106	0.0000	33.1923	33.1923	2.1600e-003	0.0000	33.2376
Total	**1.2725**	**0.1831**	**0.2358**	**3.9000e-004**		**0.0106**	**0.0106**		**0.0106**	**0.0106**	**0.0000**	**33.1923**	**33.1923**	**2.1600e-003**	**0.0000**	**33.2376**

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	0.0134	0.0195	0.1873	6.4000e-004	0.0545	3.9000e-004	0.0548	0.0145	3.6000e-004	0.0148	0.0000	40.7055	40.7055	1.8100e-003	0.0000	40.7435
Total	**0.0134**	**0.0195**	**0.1873**	**6.4000e-004**	**0.0545**	**3.9000e-004**	**0.0548**	**0.0145**	**3.6000e-004**	**0.0148**	**0.0000**	**40.7055**	**40.7055**	**1.8100e-003**	**0.0000**	**40.7435**

3.6 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	1.2459					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0249	0.1694	0.2355	3.9000e-004		9.2100e-003	9.2100e-003		9.2100e-003	9.2100e-003	0.0000	33.1923	33.1923	1.9900e-003	0.0000	33.2340
Total	**1.2708**	**0.1694**	**0.2355**	**3.9000e-004**		**9.2100e-003**	**9.2100e-003**		**9.2100e-003**	**9.2100e-003**	**0.0000**	**33.1923**	**33.1923**	**1.9900e-003**	**0.0000**	**33.2340**

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	0.0127	0.0183	0.1760	6.4000e-004	0.0545	3.9000e-004	0.0548	0.0145	3.6000e-004	0.0148	0.0000	40.0941	40.0941	1.7300e-003	0.0000	40.1305
Total	**0.0127**	**0.0183**	**0.1760**	**6.4000e-004**	**0.0545**	**3.9000e-004**	**0.0548**	**0.0145**	**3.6000e-004**	**0.0148**	**0.0000**	**40.0941**	**40.0941**	**1.7300e-003**	**0.0000**	**40.1305**

3.6 Architectural Coating - 2023

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	1.2459					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0249	0.1694	0.2354	3.9000e-004		9.2100e-003	9.2100e-003		9.2100e-003	9.2100e-003	0.0000	33.1923	33.1923	1.9900e-003	0.0000	33.2340
Total	**1.2708**	**0.1694**	**0.2354**	**3.9000e-004**		**9.2100e-003**	**9.2100e-003**		**9.2100e-003**	**9.2100e-003**	**0.0000**	**33.1923**	**33.1923**	**1.9900e-003**	**0.0000**	**33.2340**

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	0.0127	0.0183	0.1760	6.4000e-004	0.0545	3.9000e-004	0.0548	0.0145	3.6000e-004	0.0148	0.0000	40.0941	40.0941	1.7300e-003	0.0000	40.1305
Total	**0.0127**	**0.0183**	**0.1760**	**6.4000e-004**	**0.0545**	**3.9000e-004**	**0.0548**	**0.0145**	**3.6000e-004**	**0.0148**	**0.0000**	**40.0941**	**40.0941**	**1.7300e-003**	**0.0000**	**40.1305**

3.6 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6469					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0122	0.0823	0.1222	2.0000e-004		4.1100e-003	4.1100e-003		4.1100e-003	4.1100e-003	0.0000	17.2345	17.2345	9.7000e-004	0.0000	17.2548
Total	**0.6591**	**0.0823**	**0.1222**	**2.0000e-004**		**4.1100e-003**	**4.1100e-003**		**4.1100e-003**	**4.1100e-003**	**0.0000**	**17.2345**	**17.2345**	**9.7000e-004**	**0.0000**	**17.2548**

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	6.2500e-003	8.9800e-003	0.0863	3.3000e-004	0.0283	2.0000e-004	0.0285	7.5200e-003	1.9000e-004	7.7100e-003	0.0000	20.5324	20.5324	8.7000e-004	0.0000	20.5506
Total	**6.2500e-003**	**8.9800e-003**	**0.0863**	**3.3000e-004**	**0.0283**	**2.0000e-004**	**0.0285**	**7.5200e-003**	**1.9000e-004**	**7.7100e-003**	**0.0000**	**20.5324**	**20.5324**	**8.7000e-004**	**0.0000**	**20.5506**

3.6 Architectural Coating - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6469					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0122	0.0823	0.1222	2.0000e-004		4.1100e-003	4.1100e-003		4.1100e-003	4.1100e-003	0.0000	17.2344	17.2344	9.7000e-004	0.0000	17.2548
Total	**0.6591**	**0.0823**	**0.1222**	**2.0000e-004**		**4.1100e-003**	**4.1100e-003**		**4.1100e-003**	**4.1100e-003**	**0.0000**	**17.2344**	**17.2344**	**9.7000e-004**	**0.0000**	**17.2548**

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	6.2500e-003	8.9800e-003	0.0863	3.3000e-004	0.0283	2.0000e-004	0.0285	7.5200e-003	1.9000e-004	7.7100e-003	0.0000	20.5324	20.5324	8.7000e-004	0.0000	20.5506
Total	**6.2500e-003**	**8.9800e-003**	**0.0863**	**3.3000e-004**	**0.0283**	**2.0000e-004**	**0.0285**	**7.5200e-003**	**1.9000e-004**	**7.7100e-003**	**0.0000**	**20.5324**	**20.5324**	**8.7000e-004**	**0.0000**	**20.5506**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	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	2.5070	4.4799	23.9500	0.0720	5.0693	0.0819	5.1512	1.3574	0.0756	1.4330	0.0000	4,795.0019	4,795.0019	0.1619	0.0000	4,798.4025
Unmitigated	2.5070	4.4799	23.9500	0.0720	5.0693	0.0819	5.1512	1.3574	0.0756	1.4330	0.0000	4,795.0019	4,795.0019	0.1619	0.0000	4,798.4025

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	6,102.32	6,102.32	6102.32	13,622,612	13,622,612
Total	6,102.32	6,102.32	6,102.32	13,622,612	13,622,612

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	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.527459	0.065504	0.176626	0.142970	0.035962	0.004781	0.010016	0.023598	0.001244	0.001463	0.006483	0.001857	0.002036

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	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	1,301.7371	1,301.7371	0.0589	0.0122	1,306.7484
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,318.9212	1,318.9212	0.0596	0.0123	1,323.9986
NaturalGas Mitigated	0.0965	0.8250	0.3511	5.2700e-003		0.0667	0.0667		0.0667	0.0667	0.0000	955.4283	955.4283	0.0183	0.0175	961.2429
NaturalGas Unmitigated	0.1220	1.0421	0.4435	6.6500e-003		0.0843	0.0843		0.0843	0.0843	0.0000	1,206.8960	1,206.8960	0.0231	0.0221	1,214.2410

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	2.26164e+007	0.1220	1.0421	0.4435	6.6500e-003		0.0843	0.0843		0.0843	0.0843	0.0000	1,206.8960	1,206.8960	0.0231	0.0221	1,214.2410
Total		**0.1220**	**1.0421**	**0.4435**	**6.6500e-003**		**0.0843**	**0.0843**		**0.0843**	**0.0843**	**0.0000**	**1,206.8960**	**1,206.8960**	**0.0231**	**0.0221**	**1,214.2410**

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	1.7904e+007	0.0965	0.8250	0.3511	5.2700e-003		0.0667	0.0667		0.0667	0.0667	0.0000	955.4283	955.4283	0.0183	0.0175	961.2429
Total		**0.0965**	**0.8250**	**0.3511**	**5.2700e-003**		**0.0667**	**0.0667**		**0.0667**	**0.0667**	**0.0000**	**955.4283**	**955.4283**	**0.0183**	**0.0175**	**961.2429**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	4.53375e+006	1,318.9212	0.0596	0.0123	1,323.9986
Total		**1,318.9212**	**0.0596**	**0.0123**	**1,323.9986**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	4.47468e+006	1,301.7371	0.0589	0.0122	1,306.7484
Total		**1,301.7371**	**0.0589**	**0.0122**	**1,306.7484**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

Use Low VOC Cleaning Supplies

	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	5.1291	0.0548	4.7578	2.5000e-004		0.0295	0.0295		0.0295	0.0295	0.0000	52.9575	52.9575	8.3300e-003	8.3000e-004	53.3892
Unmitigated	9.2295	0.1256	10.5483	6.3300e-003		0.8700	0.8700		0.8700	0.8700	88.6569	32.6252	121.2821	0.1982	4.6900e-003	126.8974

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	0.8122					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.5062					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	3.7681	0.0708	5.7908	6.0800e-003		0.8437	0.8437		0.8436	0.8436	88.6569	24.8506	113.5076	0.1908	4.6900e-003	118.9662
Landscaping	0.1431	0.0548	4.7575	2.5000e-004		0.0264	0.0264		0.0264	0.0264	0.0000	7.7746	7.7746	7.4600e-003	0.0000	7.9312
Total	**9.2295**	**0.1256**	**10.5483**	**6.3300e-003**		**0.8700**	**0.8700**		**0.8700**	**0.8700**	**88.6569**	**32.6252**	**121.2821**	**0.1982**	**4.6900e-003**	**126.8974**

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	0.8122					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.1693					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	4.5700e-003	0.0000	2.5000e-004	0.0000		3.1500e-003	3.1500e-003		3.1200e-003	3.1200e-003	0.0000	45.1830	45.1830	8.7000e-004	8.3000e-004	45.4580
Landscaping	0.1431	0.0548	4.7575	2.5000e-004		0.0264	0.0264		0.0264	0.0264	0.0000	7.7746	7.7746	7.4600e-003	0.0000	7.9312
Total	**5.1291**	**0.0548**	**4.7578**	**2.5000e-004**		**0.0295**	**0.0295**		**0.0295**	**0.0295**	**0.0000**	**52.9575**	**52.9575**	**8.3300e-003**	**8.3000e-004**	**53.3892**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	105.7992	1.3648	0.0330	144.6739
Unmitigated	105.7992	1.3651	0.0330	144.6950

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	41.7637 / 26.3293	105.7992	1.3651	0.0330	144.6950
Total		**105.7992**	**1.3651**	**0.0330**	**144.6950**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	41.7637 / 26.3293	105.7992	1.3648	0.0330	144.6739
Total		**105.7992**	**1.3648**	**0.0330**	**144.6739**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	156.2746	9.2356	0.0000	350.2215
Unmitigated	156.2746	9.2356	0.0000	350.2215

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	769.86	156.2746	9.2356	0.0000	350.2215
Total		**156.2746**	**9.2356**	**0.0000**	**350.2215**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	769.86	156.2746	9.2356	0.0000	350.2215
Total		**156.2746**	**9.2356**	**0.0000**	**350.2215**

9.0 Operational Offroad

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

10.0 Vegetation