4.1 AIR QUALITY

4.1.1 INTRODUCTION

This section evaluates the potential impacts on air quality resulting from implementation of the proposed project. This includes the potential for the proposed project to conflict with or obstruct implementation of the applicable air quality plan, violate an air quality standard or contribute substantially to an existing or projected air quality violation, result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment, expose sensitive receptors to substantial pollutant concentrations, or create objectionable odors affecting a substantial number of people. This section also sets forth mitigation measure to minimize or avoid significant impacts.

All of the reports and sources used in the preparation of the analysis are listed in **Section 4.1.5, References,** and are on file with the City of Fairfield ("City").

Data used to prepare this section were taken from various sources, including the Bay Area Air Quality Management District (BAAQMD) *California Environmental Quality Act Air Quality Guidelines,* dated May 2017, and the BAAQMD *Clean Air Plan 2017*.

The City received one comment related to air quality in response to the Notice of Preparation (NOP) issued for this EIR. The commenter stated that the proposed project would subject future project site residents to air pollution due to its close proximity to the Interstate 80 (I-80) corridor and that the EIR should discuss how potential adverse health impacts would be mitigated.

In *California Building Industry Association v. Bay Area Air Quality Management District (2015) 62 Cal.4th 369, Case No. S213478*, the California Supreme Court ruled that *"CEQA generally does not require an analysis of how existing environmental conditions will impact a project's future users or residents…Despite the statute's evident concern with protecting the environment and human health, its relevant provisions are best read to focus almost entirely on how projects affect the environment."* The Supreme Court upheld *"evaluating a project's potentially significant exacerbating effects on existing environmental hazards . . .Because this type of inquiry still focuses on the project's impacts on the environment—how a project might worsen existing conditions—directing an agency to evaluate how such worsened conditions could affect a project's future users or residents is entirely consistent with this focus and with CEQA as a whole."* The Supreme Court also determined that CEQA requires an analysis of exposing new receptors to existing environmental hazards *"in several specific contexts involving certain airport (§ 21096) and school construction projects (§ 21151.8), and some housing development projects (§§ 21159.21, subds. (f), (h), 21159.22, subds. (a), (b)(3), 21159.23, subd. (a)(2)(A), 21159.24, subd. (a)(1), (3), 21155.1, subd. (a)(4), (6))."* These provisions *"constitute specific exceptions to CEQA's general*

rule requiring consideration only of a project's effect on the environment, not the environment's effects on project users."

As a result of this ruling, lead agencies are not required to analyze the impacts of the existing environment on a project's future residents in a CEQA document. An exception to this rule would occur if the project were to exacerbate an existing environmental hazard, or if the lead agency has a General Plan policy or ordinance that specifically sets forth that a project cannot expose future residents to impacts from existing environmental conditions such as air pollutant emissions from traffic on nearby roadways. The City does not have a General Plan policy or an ordinance that specifically analyzes air quality emissions from land development projects on future residents. Therefore, an analysis of the potential adverse health impacts on future project residents from exposure to traffic related pollutant emissions is not provided.

4.1.2 EXISTING CONDITIONS

4.1.2.1 Existing Regional Air Quality

Background

The project site is located on the western edge of the Suisan Marsh in Solano County. This area is situated along the northeastern portion of the San Francisco Bay Area Air Basin (SFBAAB). The SFBAAB includes all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties as well as the southern half of Sonoma County and the southwestern portion of Solano County.

Fairfield has a semi-arid temperate climate. The annual average minimum temperature is 47°F in Fairfield. July is usually the warmest month with annual average maximum temperatures around 73°F. Fairfield gets, on average, over 23 inches of precipitation annually (Western Regional Climate Center 2018). The region averages approximately 30 inches of rain per year, with most of the rain falling during winter. Fog from nearby marshes and bays is common during winter. The prevailing wind in the region is from the southwest and west-southwest through the Carquinez Strait and wind speeds average 20-45 miles per hour.

Regional Air Quality

Air pollutants of concern in the air basin are primarily generated by three categories of sources: mobile, stationary, and area sources. Mobile sources refer to operational and evaporative emissions from motor vehicles. Stationary sources include "point sources" which have one or more emission sources at a single facility. Point sources are usually associated with manufacturing and industrial uses and include sources

such as refinery boilers or combustion equipment that produces electricity or process heat. Area sources include sources that produce widely distributed emissions. Examples of area sources include residential water heaters, painting operations, lawn mowers, agricultural fields, landfills, and consumer products, such as lighter fluid or hair spray.

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards for outdoor concentrations. The federal and state standards have been set at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons such as children, pregnant women, and the elderly, from illness or discomfort. Criteria air pollutants include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter 2.5 microns or less in diameter (PM2.5), particulate matter ten microns or less in diameter (PM10), and lead (Pb). Note that Reactive Organic Gases (ROGs), which are also known as reactive organic compounds (ROCs) or volatile organic compounds (VOCs), and Nitrogen oxide (NOx), are not classified as criteria pollutants. However, ROGs and NOx are widely emitted from land development projects and participate in photochemical reactions in the atmosphere to form O_3; therefore, NOx and ROGs are relevant to the proposed project and are of concern in the air basin and are listed below along with the criteria pollutants.

- **Ozone (O_3).** O_3 is a gas that is formed when NOx and ROGs, both byproducts of internal combustion engine exhaust and other sources undergo slow photochemical reactions in the presence of sunlight. Ozone concentrations are generally highest during the summer months when the combination of direct sunlight, light wind, and warm temperature conditions create conditions favorable to the formation of this pollutant.

- **Reactive Organic Gases (ROGs).** ROGs are compounds composed primarily of atoms of hydrogen and carbon. Internal combustion associated with motor vehicle usage is the major source of these hydrocarbons. Adverse effects on human health are not caused directly by ROGs, but rather by reactions of ROGs to form secondary air pollutants, including ozone.

- **Nitrogen Dioxide (NO_2) and Nitrogen Oxides (NOx).** Fuel combustion produces nitrogen which combines with oxygen to produce nitric oxide (NO). Further oxidation of NO results in the formation of NO_2, which is a criteria pollutant. NO_2 is a reddish-brown, highly reactive gas which acts as an acute irritant and, in equal concentrations, is more injurious than NO. NO and NO_2 are referred to together as oxides of nitrogen (NOx). As noted above, NOx is involved in photochemical reactions that produce ozone.

- **Carbon Monoxide (CO).** CO is a colorless, odorless gas produced by the incomplete combustion of fuels. CO concentrations tend to be the highest during winter mornings, with little to no wind, when surface-based inversions trap the pollutant at ground levels. Because CO is emitted directly from internal combustion engines and motor vehicles operating at slow speeds, the highest ambient CO concentrations are generally found near congested transportation corridors and intersections.

- **Sulfur dioxide (SO_2).** SO_2 is a colorless, extremely irritating gas or liquid. It enters the atmosphere as a pollutant mainly as a result of burning high-sulfur-content fuel oils and coal and from chemical

processes occurring at chemical plants and refineries. When sulfur dioxide oxidizes in the atmosphere, it forms sulfates (SO_4).

- **Respirable Particulate Matter (PM_{10}).** PM_{10} consists of extremely small, suspended particles or droplets 10 micrometers or smaller in diameter. Some sources of PM_{10}, like pollen and windstorms, are naturally occurring. However, in populated areas, most PM_{10} is caused by road dust, diesel soot, and combustion products, abrasion of tires and brakes, and construction activities.

- **Fine Particulate Matter ($PM_{2.5}$).** $PM_{2.5}$ refers to particulate matter that is 2.5 micrometers or smaller in size. The sources of $PM_{2.5}$ include fuel combustion from automobiles, power plants, wood burning, industrial processes, and diesel-powered vehicles such as buses and trucks. These fine particles are also formed in the atmosphere when gases such as sulfur dioxide, NO_X, and VOCs are transformed in the air by chemical reactions.

- **Lead (Pb).** Pb occurs in the atmosphere as particulate matter. The combustion of leaded gasoline is the primary source of airborne lead in the Basin. The use of leaded gasoline is no longer permitted for on-road motor vehicles, so most such combustion emissions are associated with off-road vehicles such as racecars that use leaded gasoline. Other sources of Pb include the manufacturing and recycling of batteries, paint, ink, ceramics, ammunition, and secondary lead smelters.

The U.S. Environmental Protection Agency (EPA) is the federal agency responsible for setting the National Ambient Air Quality Standards (NAAQS). The air quality of a region is considered to be in attainment of the NAAQS if the measured ambient criteria pollutant levels are not exceeded more than once per year, except for O_3, PM_{10}, $PM_{2.5}$. The NAAQS for O_3, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over one- to three-year periods, depending on the pollutant. The California Air Resources Board (CARB) is the state agency responsible for setting the California Ambient Air Quality Standards (CAAQS). The air quality of a region is considered to be in attainment of the CAAQS if the measured ambient air pollutant levels for O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead are not exceeded, and other standards are not equaled or exceeded at any time in any consecutive three-year period. The NAAQS and CAAQS for each of the monitored pollutants and their effects on health are summarized in **Table 4.1-1, Ambient Air Quality Standards**.

Table 4.1-1
Ambient Air Quality Standards

Air Pollutant	Averaging Time	California Standards	National Standards[1]		Health and Other Effects
			Primary[2,3]	Secondary[2,4]	
Ozone (O_3)	8-hour	0.070 ppm (137 µg/m³)	0.070 ppm (137 µg/m³)	Same as primary	(a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; and (f) Property damage
	1-hour	0.09 ppm (180 µg/m³)	--[5]	--	
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	--	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and (d) Possible increased risk to fetuses
	1-hour	20 ppm (23 mg/m³)	35 ppm (40 mg/m³)	--	
Nitrogen Dioxide (NO_2)	Annual	0.030 ppm (57 µg/m³)	0.053 ppm (100 µg/m³)	Same as primary	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and (c) Contribution to atmospheric discoloration
	1-hour	0.18 ppm (339 µg/m³)	0.100 ppm[6] (188 µg/m³)	--	
	Annual	--	--[7]	--	
	24-hour	0.04 ppm (105 µg/m³)	--[7]	--	
	3-hour	--	--	0.5 ppm (1300 µg/m³)	
Sulfur Dioxide (SO_2)	1-hour	0.25 ppm (655 µg/m³)	0.075 ppm[7] (196 µg/m³)	--	Bronchoconstriction accompanied by symptoms, which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Respirable Particulate Matter (PM10)	Annual	20 µg/m³	--	--	a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and (c) Increased risk of premature death from heart or lung diseases in the elderly
	24-hour	50 µg/m³	150 µg/m³	Same as primary	

Air Pollutant	Averaging Time	California Standards	National Standards[1]		Health and Other Effects
			Primary[2,3]	Secondary[2,4]	
Fine Particulate Matter (PM2.5)	24-hour	No separate state standard	35 µg/m³	--	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and (c) Increased risk of premature death from heart or lung diseases in the elderly
	Annual	12 µg/m³	12 µg/m³	--	
Lead	Calendar Quarter	--	1.5 µg/m³	Same as primary	(a) Increased body burden; and (b) Impairment of blood formation and nerve conduction
	30-day Average	1.5 µg/m3	--	--	

Source: CARB, Ambient Air Quality Standards, accessed August 8, 2018 (https://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm)
ppm = parts per million by volume; µg/m³ = microgram per cubic meter; mg/m³ = milligrams per cubic meter.

[1] *Standards, other than for ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.*

[2] *Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.*

[3] *Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the U.S. Environmental Protection Agency (US EPA).*

[4] *Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.*

[5] *The national 1-hour ozone standard was revoked by US EPA on June 15, 2005. A new 8-hour standard was established in May 2008.*

[6] *The form of the 1-hour NO_2 standard is the 3-year average of the 98th percentile of the daily maximum 1-hour average concentration.*

[7] *On June 2, 2010 the US EPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of the 1-hour daily maximum. The US EPA also revoked both the existing 24-hour and annual average SO_2 standards.*

In addition to criteria pollutants, CARB periodically assesses levels of toxic air contaminants (TACs) in the SFBAAB. TACs are defined by California Health and Safety Code Section 39655:

> *"Toxic air contaminant" means an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health. A substance that is listed as a hazardous air pollutant pursuant to subsection (b) of Section 112 of the federal act (42 U.S.C. Sec. 7412(b)) is a toxic air contaminant.*

Table 4.1-2, Attainment Status of the San Francisco Bay Area Air Basin, below presents the current attainment status of the SFBAAB with respect to State and federal air quality standards.

Table 4.1-2
Attainment Status of the San Francisco Bay Area Air Basin

Pollutant	State	Federal
Ozone (O_3)	Non-Attainment	Non-Attainment
Particulate Matter (PM_{10})	Non-Attainment	Unclassified
Particulate Matter ($PM_{2.5}$)	Non-Attainment	Attainment/Unclassified

Pollutant	State	Federal
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Lead	Attainment	Attainment

Source: BAAQMD. 2018. http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status. Accessed August 7, 2018.

4.1.2.2 Existing Local Air Quality

The U.S. EPA requires all air pollution control districts to submit monitoring assessments every five years. The Fairfield-Chadbourne Road, Vallejo-304 Tuolumne Street, and Vacaville-Merchant Street air monitoring stations were used to obtain monitoring data based on which stations were nearest to the project site and monitored a particular pollutant.

The SFBAAB is considered in non-attainment for ozone, PM10, and PM2.5 with regards to standards established by the State of California. The SFBAAB is considered non-attainment for ozone with regards to standards established by the Federal government. **Table 4.1-3, Ambient Pollutant Levels Near the Project Site**, illustrates the concentrations of pollutants from 2016 to 2018. During this time period, although there were no exceedances of ozone standards, there were several exceedances of both PM10 and PM2.5 standards.

Table 4.1-3
Ambient Pollutant Levels Near the Project Site

	Year		
Pollutant	**2016**	**2017**	**2018**
Ozone (ppm), 1- Hour average	0.081	0.080	0.078
Number of days of State exceedances	0	0	0
Number of days of Federal exceedances	0	0	0
Ozone (ppm), 8-Hour average	0.067	0.062	0.066
Number of days of State exceedances	0	0	0
Number of days of Federal exceedances	0	0	0
Particulate Matter < 10 microns ($\mu g/m^3$), Worst 24 Hours	24.7	242.0	130.6
Number of days of State exceedances (estimated)	0	13	13
Number of days of Federal exceedances (estimated)	0	6	0
Particulate Matter < 2.5 microns ($\mu g/m^3$), 24 – Hour average	23.0	101.9	197.2
Number of days of Federal exceedances (estimated)	0	9	16

Pollutant	Year		
	2016	2017	2018
Nitrogen Dioxide (ppm) 1-Hour average	0.043	0.049	0.057
Number of days of State exceedances	0	0	0
Number of days of Federal exceedances	0	0	0

Source: CARB, Aerometric Data Analysis and Measurement System (ADAM), Available at https://www.arb.ca.gov/adam.*. Accessed July 31, 2019. Ozone data from Fairfield-Chadbourne Road air monitoring station. PM2.5 and NO2 data from the Vallejo-304 Tuolumne Street air monitoring station. PM10 data from the Vacaville-Merchant Street air monitoring station. No stations in Solano County during the 2016-2018 time period measured SO_2 or CO.*

4.1.2.3 Human Health Effects of Air Pollution

Air pollution is a major public health concern. Studies conducted in various parts of the world, including the United States, have documented a wide range of adverse effects of ambient air pollution on human health. Adverse health effects from short-term and long-term exposure to air pollution include the following:

- Increased respiratory illnesses (asthma incidence, asthma severity, hospital care for asthma, infections, and other symptoms);
- Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease;
- Decreased lung function and lung inflammation;
- Increased mortality, including increased risk of premature death from heart or lung diseases in the elderly and people with potentially predisposing conditions (such as chronic obstructive pulmonary disease, diabetes, congestive heart failure, and myocardial infarction);
- Declines in pulmonary function growth in children;
- Potential immunological changes;
- Increase in physician and emergency room visits, and hospitalization; and
- Increase in absence from school.

Although numerous air pollutants are emitted by both natural and anthropogenic sources and contribute to adverse human health effects (see **Table 4.1-1** above for health effects of all pollutants), ozone and particulate matter have been identified as the pollutants of greatest concern. The two pollutants are also considered co-pollutants in terms of their incidence, and one pollutant has the effect of confounding the effect of the other. According to the World Health Organization, "[t]he correlations between ozone and other harmful air pollutants differ by season and place, making confounding control complicated. During summer, there is often a positive correlation with secondary particles, since similar conditions increase

the formation of both. On the other hand, especially when ozone formation is limited (winter), there are often strong inverse correlations between ozone and primary pollutants from traffic and heating, because nitric oxide emissions scavenge ozone." "A further complexity in the study of the health effects of ground level ozone, particularly the health effects associated with short-term exposures, arises from the close correlation between ozone production and depletion with meteorological conditions (Royal Society, 2008). Since high temperatures (Baccini et al., 2008) and heat waves in particular (Kovats & Hajat, 2008) are associated with increased mortality, the separation of the health effects of ozone from those of temperature is problematic." (WHO 2013)

Further, several factors influence health impacts, which include the concentrations of ground-level ozone; the duration of exposure, the volume of air that is inhaled per minute, the intervals between exposures, and the sensitivity of the persons to the exposure. As noted earlier in this section, ozone is not emitted directly but is formed under certain meteorological conditions from ozone precursors ROGs and NOx. Consequently, ground-level concentrations of ozone are highly variable and are influenced by the volume of air available for dilution, the temperature, and the intensity of ultraviolet light. Similarly, concentrations of other pollutants, such particulate matter, vary depending on meteorological conditions, distance between source and receptors, and other factors. For the same level of exposure, health effects can vary from individual to individual. Certain subgroups of the population, such as children, persons with preexisting respiratory conditions, and individuals exercising outdoors are at greater risk from exposure to outdoor ozone and particulate matter than the general population.

4.1.2.4 Sensitive Receptors

As noted above, some groups of people are considered more sensitive to adverse effects from air pollution than the general population. CARB has identified the following persons as most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks.

Sensitive receptors, which include residences, are located near the project site. Sensitive receptors within 1,000 feet of the proposed project site include the following:

- Single-family residences located approximately 260 feet to the northeast of the project site.
- Medical offices located approximately 270 feet to the west of the project site.
- Single-family residences located approximately 730 feet to the northwest of the project site.

- Rockville Terrance senior living facility located approximately 1,000 feet to the southwest of the project site.

4.1.3 REGULATORY FRAMEWORK

Air quality within the air basin is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for improving the air quality within the air basin are discussed below.

U.S. Environmental Protection Agency

The United States Environmental Protection Agency (US EPA) is responsible for implementing and enforcing the federal Clean Air Act (CAA) and developing the NAAQS. The NAAQS identify concentrations for seven criteria pollutants that are considered the maximum levels of ambient (background) air pollutants considered safe, with an adequate margin of safety, to protect the public health and welfare. The seven criteria pollutants are O_3, CO, NO_2, SO_2, PM10, PM2.5, and lead. The federal ambient air quality standards and the relevant health effects of the criteria pollutants are summarized above in **Table 4.1-1**. As part of its implementation responsibilities, the US EPA requires each state to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain and/or maintain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs.

The SFBAAB is currently classified by the US EPA as a nonattainment area for the 8-hour standard for O_3 and a nonattainment area for PM2.5. Additionally, it has been designated as an attainment/unclassifiable area for the 1-hour and 8-hour standards for CO and the annual standard for NO_2, and as an attainment area for the quarterly lead standard and 24-hour and annual SO_2 standards. The SFBAAB is currently designated as unclassifiable for the 24-hour PM10 standard.

California Air Resources Board

CARB oversees air quality planning and control throughout California. It is primarily responsible for ensuring implementation of the California Clean Air Act (CAA), responding to the federal CAA planning requirements applicable to the State, and regulating emissions from motor vehicles and consumer products within the State. In addition, CARB sets health-based air quality standards and control measures for toxic air contaminants (TACs). Much of CARB's research goes toward automobile emissions, as they are primary contributors to air pollution in California. Under the California CAA, CARB has the authority to establish more stringent standards for vehicles sold in California and for

various types of equipment available commercially. It also sets fuel specifications to further reduce vehicular emissions.

The California CAA established a legal mandate for air basins to achieve the CAAQS by the earliest practical date. These standards apply to the same seven criteria pollutants as the federal CAA and also include sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. The State standards are generally more stringent than the federal standards.

CARB supervises and supports the regulatory activities of local air quality districts as well as monitors air quality itself. Health and Safety Code Section 39607(e) requires CARB to establish and periodically review area designation criteria. These designation criteria provide the basis for CARB to designate areas of the State as attainment, nonattainment, or unclassified according to State standards. CARB makes area designations for 10 criteria pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, sulfates, lead, hydrogen sulfide, and visibility-reducing particles.[1] The air quality of a region is considered to be in attainment of the State standards if the measured ambient air pollutant levels for O_3, CO, NO_2, PM_{10}, $PM_{2.5}$, SO_2 (1- and 24-hour), and lead are not exceeded, and all other standards are not equaled or exceeded at any time in any consecutive three-year period.

Bay Area Air Quality Management District

Management of air quality in the SFBAAB is the responsibility of the BAAQMD. The BAAQMD is responsible for bringing and/or maintaining air quality in the SFBAAB within federal and state air quality standards. Specifically, the BAAQMD has responsibility for monitoring ambient air pollutant levels throughout the SFBAAB and developing and implementing attainment strategies to ensure that future emissions will be within federal and state standards. The following plans have been developed by the BAAQMD to achieve attainment of the federal and state ozone standards. The Clean Air Plan (CAP) and Ozone Strategy fulfill the planning requirements of the California CAA, while the Ozone Attainment Plan fulfills the federal CAA requirements.

The California CAA requires air districts within nonattainment areas to prepare triennial assessments and revisions to their CAPs. The BAAQMD has prepared a series of CAPs, the most recent of which was

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1 California Air Resources Board, "Area Designations (Activities and Maps)," http://www.arb.ca.gov/desig/desig.htm. 2010. According to California Health and Safety Code, Section 39608, "State board, in consultation with the districts, shall identify, pursuant to subdivision (e) of Section 39607, and classify each air basin which is in attainment and each air basin which is in nonattainment for any State ambient air quality standard." Section 39607(e) States that the State shall "establish and periodically review criteria for designating an air basin attainment or nonattainment for any State ambient air quality standard set forth in Section 70200 of Title 17 of the California Code of Regulations. California Code of Regulations, Title 17, Section 70200 does not include vinyl chloride; therefore, CARB does not make area designations for vinyl chloride.

adopted in April of 2017 (BAAQMD 2017a). The 2017 CAP continues the air pollution reduction strategy established by the 1991 CAP and represents the fifth triennial update to the 1991 CAP, following previous updates of 1994, 1997, 2000, and 2010. The 2017 CAP is designed to address attainment of the state standard for ozone, particulate matter, air toxics, and greenhouse gases. CAPs are intended to focus on the near-term actions through amendments of existing regulations and promulgation of new District regulations.

The Bay Area 2017 CAP provides a comprehensive plan to improve Bay Area air quality and protect public health. The 2017 CAP defines a control strategy that the District and its partners will implement to: (1) reduce emissions and decrease ambient concentrations of harmful pollutants; (2) safeguard public health by reducing exposure to air pollutants that poses the greatest health risk, with an emphasis on protecting the communities most heavily impacted by air pollution; and (3) reduce greenhouse gas emissions to protect the climate. State law requires the CAP to include all feasible measures to reduce emissions of ozone precursors and to reduce transport of ozone precursors to neighboring air basins.

BAAQMD CEQA Air Quality Guidelines

On June 2, 2010, the Bay Area Air Quality Management District's Board of Directors unanimously adopted thresholds of significance to assist in the review of projects under the California Environmental Quality Act (CEQA). These thresholds were designed to establish the level at which the District believed air pollution emissions would cause significant environmental impacts under CEQA and were posted on the Air District's website and included in the Air District's 2012 *CEQA Air Quality Guidelines*. The thresholds were challenged in court. In an opinion issued on December 17, 2015, the California Supreme Court held that CEQA does not generally require an analysis of the impacts of locating development in areas subject to environmental hazards unless the project would exacerbate existing environmental hazards. The Supreme Court also found that CEQA requires the analysis of exposing people to environmental hazards in specific circumstances, including the location of development near airports, schools, near sources of toxic contamination, and when relying on certain CEQA exemptions for infill and workforce housing. The Supreme Court also held that public agencies remain free to conduct this analysis regardless of whether it is required by CEQA.

In view of the Supreme Court's opinion, local agencies may rely on BAAQMD thresholds designed to reflect the impact of locating development near areas of toxic air contamination where such an analysis is required by CEQA or where the agency has determined that such an analysis would assist in making a decision about a project. However, these thresholds are not mandatory and agencies should apply them only after determining that they reflect an appropriate measure of a project's impacts.

The BAAQMD recently published a new version of the guidelines dated May 2017, which includes revisions made to address the Supreme Court's opinion. The Air District is currently working to update any outdated information in the guidelines.

BAAQMD Rules and Regulations

Specific rules and regulations have been adopted by the BAAQMD that limit emissions that can be generated by various uses and/or activities. These rules regulate not only the emissions of the state and federal criteria pollutants, but also the emissions of TACs. The rules are also subject to ongoing refinement by the BAAQMD.

In general, all stationary sources with air emissions are subject to the BAAQMD's rules governing their operational emissions. Some emissions sources are further subject to regulation through the BAAQMD's permitting process. Through this permitting process, the BAAQMD also monitors the amount of emissions being generated by stationary sources and uses this information in developing the CAP. A few of the primary BAAQMD rules applicable to the proposed project include, among others, the following:

- **Regulation 8, Rule 3 (Architectural Coatings):** This rule sets limits on reactive organic gases (ROG) content in architectural coatings sold, supplied, offered for sale, or manufactured within the BAAQMD's jurisdiction. The rule also includes time schedules that specify when more stringent ROG standards are to be enforced. The rule applies during the construction phase of a project. In addition, any periodic architectural coating maintenance operations are required to comply with this rule.

- **Regulation 8, Rule 15 (Emulsified and Liquid Asphalts):** This rule sets limits on the ROG content in emulsified and liquid asphalt used for maintenance and paving operations. The rule includes specific ROG content requirements for various types of asphalt (e.g., emulsified asphalt, rapid-cure liquid asphalt, slow-cure liquid asphalt). This rule applies during the construction phase of a project. In addition, any future asphalt maintenance of a project's roads would be required to comply with the ROG standards set in Rule 15.

- **Regulation 9, Rule 6 (Nitrogen Oxide Emission from Natural Gas-Fired Water Heaters):** This rule sets a limit on the NO_x emissions from natural gas-fired water heaters. The rule applies to natural gas-fired water heaters manufactured after July 1, 1992 with a heat input rating of less than 75,000 BTU/hour. Water heaters subject to the rule must not emit more than 40 nanograms of NO_x per joule of heat output.

- **Regulation 9, Rule 7 (Nitrogen Oxide and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters):** This rule limits the NO_x and CO emissions from industrial, institutional, and commercial boilers, steam generators, and process heaters. The rule applies to boilers with a heat input rating greater than 10 million BTU/hour fired exclusively with natural gas, liquefied petroleum gas, or a combination or boilers with a heat input rating greater than 1 million BTU/hour fired with other fuels.

- **Regulation 9, Rule 8 (Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines):** This rule limits the NO_x and CO emissions from stationary internal combustion engines. The rule applies to engines rated at greater than 50 brake horsepower, but it exempts emergency generators that would not run for more than 100 hours per year.

4.1.4 IMPACTS AND MITIGATION MEASURES

4.1.4.1 Significance Criteria

The impacts related to air quality from the proposed project would be considered significant if they would exceed the following significance criteria, in accordance with Appendix G of the *State CEQA Guidelines*:

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

As noted above, both the federal and state governments have established ambient air quality standards for outdoor concentrations of criteria pollutants. The federal and state standards have been set at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons such as children, pregnant women, and the elderly, from illness or discomfort. The BAAQMD is responsible for bringing and/or maintaining air quality in the SFBAAB within federal and state air quality standards. Specifically, the BAAQMD has responsibility for monitoring ambient air pollutant levels throughout the SFBAAB and developing and implementing attainment strategies to ensure that future emissions will be within federal and state standards. Based on the results of monitoring and inventories of existing and projected air pollutant emissions prepared for the air basin as part of its planning process, the BAAQMD has developed numeric thresholds based on mass emissions that a lead agency may use to evaluate whether the emissions that would be added to the air basin by a proposed project would be substantial enough to result in an exceedance of an air quality standard or would contribute substantially to an existing air quality exceedance, and would therefore have the potential to result in adverse health effects. However, if a project would result in emissions below the numeric thresholds provided by the BAAQMD, the project would not contribute substantially to an existing exceedance or cause an exceedance, and hence would not have the potential to result in adverse health effects. The numeric thresholds for air quality impact evaluation from the BAAQMD CEQA Air Quality Guidelines are presented below.

Construction Emissions

Impacts related to construction emissions associated with the proposed project would be considered significant if the construction emissions exceeded the thresholds listed in **Table 4.1-4, Construction Emission Thresholds**.

Table 4.1-4
Construction Emission Thresholds

Criteria Air Pollutants	Average Daily Emissions (Pounds per Day)
ROG	54
NO_x	54
PM10 (Exhaust)	82
PM2.5 (Exhaust)	54

Source: Bay Area Air Quality Management District, CEQA Air Quality Guidelines, May 2017.

Operational Emissions

Impacts from direct and/or indirect operational emissions associated with the proposed project would be considered significant if they exceeded the daily or the annual emissions thresholds in **Table 4.1-5, Operational Emission Thresholds,** below.

Table 4.1-5
Operational Emission Thresholds

Criteria Air Pollutants	Average Daily Emissions (Pounds per Day)	Maximum Annual Emissions (Tons per Year)
ROG	54	10
NO_x	54	10
PM10	82	15
PM2.5	54	10

Source: Bay Area Air Quality Management District, CEQA Air Quality Guidelines, May 2017.

Direct emissions are those that are emitted on a site and include emissions from stationary sources and on-site mobile equipment, if applicable. Examples of land uses and activities that generate direct emissions are industrial operations and sources subject to an operating permit by the BAAQMD. Indirect

emissions come from mobile sources that access the project site, but generally are emitted off-site. For many types of land development projects, the principal source of air pollutant emissions is the motor vehicle trips generated by the project.

Carbon Monoxide

The impact associated with a project's indirect CO emissions is considered significant if the emissions will contribute to a violation of the state standards for CO (9.0 ppm averaged over 8 hours and 20 ppm over 1 hour).

Toxic Air Contaminants

Single Source Impact Threshold

If project emissions of TACs or PM2.5[2] during construction or project operation cause an existing sensitive receptor to be exposed to levels that exceed any of the thresholds of significance listed below, the proposed project would result in a significant impact and mitigation would be required.

- An excess cancer risk level of more than 10 in 1 million, or a non-cancer (chronic or acute) hazard index greater than 1.0.
- An incremental increase of more than 0.3 micrograms per cubic meter ($\mu g/m^3$) annual average PM2.5.

Cumulative Source Impact Threshold

A project would have a cumulatively considerable impact if the aggregate total of human health risks from all past, present, and foreseeable future sources within a 1,000-foot radius of the fence line of a source or from the location of a receptor, plus the contribution from the project, exceeds the following thresholds.

- An excess cancer risk level of more than 100 in 1 million or a chronic non-cancer hazard index (from all local sources) greater than 10.0.
- 0.8 $\mu g/m^3$ annual average PM2.5.

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2 One of the TACs being controlled by the BAAQMD is particulate matter from diesel-fueled engines, also known as diesel particulate matter (DPM). Compared to other TACs, DPM emissions are estimated to be responsible for about 70 percent of the total ambient air toxics risk in the Basin. DPM is emitted in equipment and vehicle exhaust in the form of PM2.5 emissions. The BAAQMD *CEQA Air Quality Guidelines* therefore include a concentration-based threshold for PM2.5 emitted during construction and operation of a proposed project.

Odors

For impacts associated with odors, the BAAQMD considers project operations that result in five confirmed complaints per year averaged over three years to have a significant impact.

4.1.4.2 Methodology

Construction Emissions of Criteria Pollutants

The California Emissions Estimator Model (CalEEMod) Version 2016.3.2 was used to predict emissions from the construction of the proposed project. Average daily emissions from project construction were calculated, including both on-site and off-site activities. On-site activities would consist of the operation of off-road construction equipment, as well as on-site truck travel (e.g., haul trucks, water trucks, dump trucks, and concrete trucks), whereas off-site sources would be emissions from construction vehicle trips.

Operational Emissions of Criteria Pollutants

CalEEMod was also used to predict emissions from the operation of the proposed project. The use of this model for evaluating air pollutant emissions from land use projects is recommended by the BAAQMD. The project land use types and size, trip generation rate and other project-specific information were input to the model to estimate operational emissions.

Operational CO Impact

The BAAQMD recommends CO modeling for a plan or a project if the addition of project traffic would increase traffic volumes at affected intersections to more than 44,000 vehicles per hour. As shown in Table 4.9-6 Project Trip Generation, the project would result in 4,120 net new vehicle trips, which would be far below 44,000. Therefore, no intersections affected by the proposed project would handle more than 44,000 vehicles per hour, and so no CO modeling is required (Fehr & Peers, 2019).

Community Health Risk Impacts

PM2.5 concentrations were modeled using the U.S. EPA AERMOD dispersion model. The CARB Hotspots Analysis and Reporting Program (HARP) Risk Assessment Standalone Tool (RAST) was utilized to calculate risks associated with PM2.5 concentrations. Construction emissions sources which were modeled included the project site, as well as potential haul route. Operational TAC emissions include an emergency/backup generator. Existing sources of emissions were estimated using the BAAQMD list of permitted stationary sources and their Diesel Internal Combustion Engine Multiplier Tool, Gasoline Dispensing Facility Distance Multiplier Tool, and Roadway Screening Analysis Calculator.

Health risks potentially associated with concentrations of TACs were calculated as estimated lifetime excess cancer risks, assuming almost continuous on-site exposure. The lifetime excess cancer risk for a pollutant is estimated as the product of a lifetime dose and the cancer potency factor derived by the Office of Environmental Health Hazard Assessment (OEHHA). In other words, it represents the increased cancer risk associated with continuous exposure to the concentrations of TAC in the air over a 30-year lifetime consistent with the latest OEHHA guidance (OEHHA 2015). This exposure begins the third trimester through age 70, with varying age sensitivity factors which are weighting factors to account for potential increased sensitivity to carcinogens during early life stages including prenatal, postnatal and juvenile life stages. Modeling details and outputs can be seen in **Appendix 4.1.**

4.1.4.3 Project Impacts and Mitigation Measures

Impact AIR-1: **Construction of the proposed project would generate construction emissions that would not result in a cumulatively considerable net increase of any criterial pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard. (*Significant; Less than Significant with Mitigation*)**

Construction activities associated with the proposed project would result in short-term emissions of criteria pollutants from the operation of construction equipment and vehicles and emissions of fugitive dust during site excavation and grading. Proposed project construction emissions are estimated below and evaluated for their potential to result in a significant impact. CalEEMod was used to estimate emissions from the construction of the proposed project assuming full build out (**Appendix 4.1**).

Criteria Pollutant Emissions

Table 4.1-6, Green Valley II Project Construction Emissions (Unmitigated), shows the average daily construction emissions of ROG, NOX, PM10 exhaust, and PM2.5 exhaust from the construction of the proposed project. Average daily emissions were computed by dividing total emissions by the total number of construction days. Total emissions are the sum of the annual emissions over the construction period. The number of construction days was computed at 380, which would occur over approximately 18-months, beginning in Spring 2020 (assumed to begin April 1st). As indicated in **Table 4.1-6**, estimated average daily project construction emissions would not exceed the thresholds for ROG, NOx, PM10, and PM2.5. Construction activities associated with the proposed project would not result in emissions that would result in a cumulatively considerable net increase of any criterial pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard, and thereby

not result in adverse health effects. The impact associated with construction-period emissions of criteria pollutants would be less than significant.

Table 4.1-6
Green Valley II Project Construction Emissions (Unmitigated)

	Average Daily Emissions (pounds/day)			
Scenario	ROG	NOx	PM10 Exhaust	PM2.5 Exhaust
Average Yearly Construction Emissions (lbs/year)				
2020	2	17	1	1
2021	12	10	<1	<1
Maximum Average Emissions (lbs/day) [1]	8	14	1	1
Thresholds (lbs/day)	54	54	82	54
Exceeds Threshold?	**No**	**No**	**No**	**No**

Source: Impact Sciences, 2019.
1 - based on 380 construction days
2 – Calculations do not include measures listed in mitigation measures AIR-1.

Fugitive Dust, PM10, and PM2.5

Construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust, including PM10 and PM2.5. Sources of fugitive dust would include disturbed soils at the construction site during grading and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site could deposit mud on local streets, which could be an additional source of airborne dust after it dries. Fugitive dust emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. Fugitive dust emissions would also depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating on the site. Larger dust particles would settle near the source (the project site), while fine particles would be dispersed over greater distances from the project site. The BAAQMD *CEQA Air Quality Guidelines* consider the impact from a project's construction-phase dust emissions to be less than significant if best management practices listed in the guidelines are implemented. Without these BMPs, fugitive emissions of PM10 and PM2.5 could result in a cumulatively considerable net increase of criteria pollutants for which the project region is non-attainment under an applicable federal or state ambient air quality standard, and potentially result in adverse health effects. The impact from dust, PM10 and PM2.5 emissions would be potentially significant.

Mitigation Measure AIR-1 requires that the dust control BMPs put forth by the BAAQMD are implemented by the proposed project. With the implementation of the required BAAQMD recommended

BMPs pursuant to **Mitigation Measure AIR-1**, the construction of the proposed project would not result in substantial emissions of fugitive dust, PM10, or PM2.5, and the impact associated with construction-period emissions of fugitive dust, PM10, and PM2.5 is considered less than significant.

Mitigation Measures:

AIR-1 The following BMPs shall be included in the construction documents, and the construction contractor(s) shall implement them during project construction, which shall be monitored by the City of Fairfield:

- 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 and feasible. Building pads shall be laid as soon as possible and feasible 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 five 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 mechanic and determined to be running in proper condition prior to operation.
- A publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints shall be posted at the project site. 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.

Significance after Mitigation: Less than significant

Impact AIR-2: Operation of the proposed project would not result in a cumulatively considerable net increase of any criterial pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard. (*Less than Significant*)

Operational air pollutant emissions would be generated primarily by automobiles driven by future residents and employees who would live and work at the project, and customers driving to the project site to access commercial or retail uses. Other sources of operational emissions include architectural coatings and maintenance products, consumer products, and energy use on the project site, including the combustion of natural gas in stoves, and heaters. CalEEMod was used to estimate emissions from operation of the proposed project assuming full build out.

The CalEEMod operational emissions modeling outputs are provided in **Appendix 4.1.** Project description information, adjustments to the model, and assumptions used in the modeling are summarized below.

Land Use Descriptions

Project land uses inputs used in CalEEMod to model operational emissions from the entire project are as follows:

- 270 dwelling units: apartments mid-rise, 248,168 square feet of building space, population: 821 persons
- 22,611 square feet retail shopping center, population: 45 workers (assuming 1 employee per 500 square feet)

Year of Analysis

Emissions associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased-in over time. Therefore, the earlier the year analyzed in the model, the higher the emission rates used by CalEEMod. The earliest year the project could possibly be constructed and fully occupied would be 2021. Emissions associated with build-out later than 2021 would

be lower, because newer vehicles have to meet increasingly more stringent emissions standards, while older, more polluting, vehicles are less utilized.

Trip Generation Rates

CalEEMod allows the user to enter specific vehicle trip generation rates, which were inputted into the model using 4,120 daily trips, which were derived from the generation rates provided in the project traffic report (Fehr & Peers 2019). Weekend rates used in CalEEMod were adjusted proportionally to the weekday rate. The project daily trip generation takes into account reductions of 1.6 percent for the mix of uses and internal capture (Fehr & Peers 2019). The default trip lengths and trip types specified by CalEEMod were used.

Area Sources

Adjustments were made to the area source inputs of CalEEMod. These include an adjustment that no residences would use wood-burning stoves or fireplaces, because wood burning stoves and fireplaces are excluded from the proposed project. Residential wood burning fireplaces and woodstoves were set to 0.

No adjustments were made in CalEEMod for consumer products. According to CalEEMod User's Guide, "Consumer products are chemically formulated products used by household and institutional consumers, including, but not limited to, detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products."

Operational Emissions

Table 4.1-8, Green Valley II Project Operational Emissions, shows the predicted emissions in terms of annual emissions in tons and average daily operational emissions in pounds per day, assuming 365 days of operation per year. **Appendix 4.1** to this Draft EIR includes the CalEEMod model output files. As shown in **Table 4.1-7**, average daily and annual emissions of ROG, NOx, PM10, and PM2.5 emissions associated with operation of the proposed project would be below the BAAQMD significance thresholds. Project operations would not result in a cumulatively considerable net increase of any criterial pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard, and are not anticipated to result in a significant increase in adverse health effects on sensitive receptors in the region. The impact of the project's operational emissions on regional air quality would be less than significant.

Table 4.1-7
Green Valley II Project Operational Emissions

Emissions Source	Estimated Emissions (Tons/Year) ROG	NO_x	PM10 Exhaust	PM2.5 Exhaust
Area Source	1.4	<0.1	<0.1	<0.1
Energy Source	<0.1	0.1	<0.1	<0.1
Mobile Source	1.1	6.2	<0.1	<0.1
Stationary Source	<0.1	<0.1	<0.1	<0.1
Annual Project Operational Emissions (tons/year)	2.5	6.3	<1	<1
Annual Thresholds (tons/year)	*10*	*10*	*15*	*10*
Exceeds Threshold?	***No***	***No***	***No***	***No***
Average Daily Emissions (pounds/day)	13.4	34.7	0.3	0.3
Daily Thresholds (pounds/day)	*54*	*54*	*82*	*54*
Exceeds Threshold?	***No***	***No***	***No***	***No***

Source: Impact Sciences, 2019

Significance after Mitigation: No mitigation measures are required.

Impact AIR-3: **Implementation of the proposed project would expose sensitive receptors to substantial pollutant concentrations. (*Significant; Less than Significant with Mitigation*)**

Exposure to Pollutant Concentrations during Construction

Construction activity for the proposed project would include site grading, placement of utilities, building construction, paving, application of architectural coatings, and interior finishing. Construction equipment and associated heavy-duty truck traffic generates exhaust which contains diesel particulate matter (DPM), which is a known TAC. The BAAQMD recommends that the impact from DPM is evaluated by estimating a project's fine particulate matter or PM2.5 emissions and resulting concentrations (BAAQMD 2017b). The BAAQMD *CEQA Air Quality Guidelines* recommend modeling of PM2.5 concentrations if sensitive receptors are present within 1,000 feet of a construction site to determine whether nearby sensitive receptors (which are defined as residences, day care centers, schools and elderly care facilities) could be exposed to substantial concentrations of DPM, resulting in community health risk impacts. In the event that sensitive receptors are not present within 1,000 feet, construction site DPM emissions are considered unlikely to result in community health effects. As noted above in **Section 4.1.2.4**, single-family

residences are located within 260 and 730 feet of the project site and Rockville Terrace senior living facility is located approximately 1,000 feet to the southwest of the project site. Therefore, the potential for the project's construction TAC emissions to result in community health risk impacts was analyzed using the methodology and thresholds set forth by the BAAQMD.

Using the U.S. EPA AERMOD dispersion model and the HARP RAST, community health risk impacts were analyzed at the maximum exposed individual (MEI), which is an individual assumed to be located where the highest concentrations of air pollutants are predicted to occur. The MEI during project construction is a residence located to the northeast of the project site, at the northeast corner of the intersection of Business Center Drive and Suisun Valley Road, as it is located along the haul route for construction supplies being delivered to the site.

Annual average PM2.5 pollutant concentrations at the MEI could be up to 0.06 μg/m^3 during construction. Although PM2.5 concentrations and the non-cancer hazard index would not exceed the BAAQMD thresholds of significance, the estimated cancer risk does exceed the BAAQMD threshold of 10 in 1 million persons. Therefore, project construction would have the potential to expose nearby receptors to substantial pollutant concentrations, and the impact would be potentially significant. **Mitigation Measure AIR-3 is** set forth below, which would reduce the cancer risk level to approximately 1.6 in one million by requiring the use of cleaner burning construction equipment engines, and the potential impacts from exposure to construction phase DPM would be reduced to a less than significant level. (Pollutant concentrations at other nearby receptors are shown in **Appendix 4.1**.)

Exposure to Pollutant Concentrations during Project Operation (TACs)

The proposed project would develop residential and commercial buildings on the project site and does not include land uses that would result in significant TAC emissions. The only stationary TAC source would be a 50 horsepower emergency generator that may be operated on diesel. Significant TAC emissions from diesel vehicles typically result from the operation of land uses such as ports, railyards, truck distribution centers, quarries, manufacturing facilities, and high volume roadways (BAAQMD 2017b). The proposed project is primarily residential housing with commercial land uses, and is anticipated to be accessed primarily by gasoline powered passenger vehicles. While it is possible that delivery vehicles could be diesel powered, these vehicles are only anticipated to emit exhaust for a brief time period resulting in minimal exhaust emissions. The generator would be operated only during an emergency. However, maintenance testing would be performed on the generator routinely and therefore the generator would result in TAC emissions periodically. Health risks from generator testing were evaluated for the MEI, which would be located at the residences to the northeast of the project site at the

northeast corner of the intersection of Suisan Valley Road and Business Center Drive. (Pollutant concentrations at other nearby receptors are shown in **Appendix 4.1**.)

Using the U.S. EPA AERMOD dispersion model and the HARP RAST, the cancer risk associated with the on-site emergency generator was estimated to be approximately 0.25 in a million persons, and a PM2.5 concentration of less than 0.01 $\mu g/m^3$ at the MEI, which are below the BAAQMD single-source thresholds of 10.0 in 1 million for cancer risk and 0.3 $\mu g/m^3$ for PM2.5 concentrations.

Exposure to CO Concentrations during Project Operation

CO emitted by project traffic is the criteria pollutant that would have the potential to result in substantial pollutant concentrations. Congested intersections with a large volume of traffic have the greatest potential to cause high, localized concentrations of CO. Air pollutant monitoring data indicate that CO levels have been at healthy levels (i.e., below State and federal standards) in the Bay Area since the early 1990s. As a result, the region has been designated as attainment for the standard. BAAQMD screening guidance indicates that the project would have a less than significant impact with respect to CO levels if the addition of project traffic would not increase the total traffic at any affected intersection to more than 44,000 vehicles per hour. The Traffic Impact Assessment (Fehr & Peers 2018) prepared for the proposed project shows that the traffic volumes at all intersections affected by the project would be less than 44,000 vehicles per hour. Therefore, the project will not result in the violation of the CO standards and would not expose sensitive receptors to substantial CO concentrations.

In summary, while project operation would not result in the exposure of sensitive receptors to substantial pollutant concentrations, project construction would have the potential to expose sensitive receptors to substantial TAC concentrations, and the impact would be significant. **Mitigation Measure AIR-3** is set forth below to mitigate this significant impact.

Mitigation Measures:

AIR-3 The construction contractor(s) shall implement the following mitigation measures during project construction, which shall be verified by the City of Fairfield:

- All diesel-powered off-road equipment larger than 50 horsepower and operating on the site for more than two days continuously shall, at a minimum, meet U.S. EPA particulate matter emissions standards for Tier 4 engines or equivalent.

- All diesel-powered portable equipment (i.e., air compressors, concrete saws, and forklifts) operating on the site for more than two days shall meet U.S. EPA particulate matter emissions standards for Tier 4 engines or equivalent.

Significance after Mitigation: Less than significant

Impact AIR-4: Implementation of the proposed project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. (*Significant; Less than Significant with Mitigation*)

Project construction would generate localized emissions of diesel exhaust during equipment operation and truck activity that may generate odors. These emissions may be noticeable from time to time to adjacent receptors. However, they would be temporary, short-term, and localized and are not likely to result in confirmed odor complaints. Furthermore, BAAQMD BMPs and **Mitigation Measure AIR-3** would be implemented to minimize diesel exhaust emissions emitted on the project site during construction. The odor impact from construction-phase emissions would be less than significant. The proposed project does not include any land uses that could subject existing receptors in the project vicinity to substantial odors, such as waste water treatment, rendering services, fiberglass manufacturing, and etcetera (BAAQMD 2017b).[3] The local serving retail could include restaurants, which could generate adverse odors as a result of cooking processes and waste disposal (BAAQMD 2017b). While project operation is not anticipated to result in the exposure of a substantial number of people to adverse odors, project operation would have the potential to expose sensitive receptors to adverse odors if restaurant tenants occupy commercial spaces, and the impact would be significant. **Mitigation Measure AIR-4** is set forth below to mitigate this significant impact.

Mitigation Measures:

AIR-4 The project applicant shall require the implementation of the following BAAQMD-recommended management practices and odor technology during project operation, should a restaurant occupy one of the commercial spaces available at the proposed project. The BAAQMD recommends that mitigation for restaurant odors be selected on a case-by-case basis in consultation with the BAAQMD. The BAAQMD, the City of Fairfield and the Solano County Environmental Health Services Division, shall verify that

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[3] Sections 3.4 and 7 of the Bay Area Air Quality Management District's CEQA Guidelines (May 2017) describes land uses that are typically associated with odor complaints. Residential and commercial land uses are not typically associated with odor complaints.

potential restaurant odor sources are properly mitigated using the measures listed below. The following practices and technology are recommended by the BAAQMD:

- Integral grease filtration system or grease removal system
- Baffle filters
- Electrostatic precipitator
- Water cooling/cleaning unit
- Disposable pleated or bag filters
- Activated carbon filters
- Oxidizing pellet beds
- Incineration
- Catalytic conversion
- Proper packaging and frequency of food waste disposal
- Exhaust stack and vent location with respect to receptors

Significance after Mitigation: Less than significant

Impact AIR-5: Implementation of the proposed project would not conflict with or obstruct implementation of the applicable air quality plan. (*Less than Significant*)

As noted above, the 2017 CAP, adopted by the BAAQMD in April 2017, is the air quality plan that is applicable to the nine-county air basin. That plan includes an emissions inventory that is based on projected growth within the Bay Area counties and cities. Because the 2017 CAP was developed after the City of Fairfield updated its 2014 Housing Element and related Land Use Policies, the CAP reflects the projected population and employment growth for the City of Fairfield. The City of Fairfield 2014 Housing Element projects that 1,541 multi-family housing units will be developed between the years 2014 and 2022. The proposed project accounts for approximately 17.5 percent of the projected multi-family growth in the 2014 Housing Element under the proposed project. The project site's zoning and designation in the General Plan would be amended to accommodate such growth. Per Chapter 25.47 of the City's Municipal

Code, the proposed project would have to be consistent with the goals, policies, and actions of the General Plan in order to receive City approval. This would ensure consistency with the General Plan growth assumptions, and therefore with the adopted CAP.

Since the growth in emissions due to operation of the proposed project would be accounted for in the development projections in the current CAP and the project's operational emissions do not exceed the BAAQMD numeric thresholds, the project would not be considered to be in conflict with the CAP, nor would it obstruct the plan's implementation. The impact would be less than significant.

Mitigation Measures: No mitigation measures are required.

4.1.5 CUMULATIVE IMPACTS AND MITIGATION MEASURES

The geographical context for the evaluation of cumulative air quality impacts with respect to criteria pollutants is the SFBAAB as the project's regional emissions would be added to the air basin. The geographical context for the evaluation of cumulative air quality impacts with respect to community health risk are TAC sources within 1,000 feet of the MEI.

Impact C-AIR-1: **Implementation of the proposed project would not result in a cumulatively considerable net increase of a criteria pollutant for which the project region is in nonattainment under an applicable federal or State ambient air quality standard. (*Less than Significant*)**

CEQA defines cumulative impacts as two or more individual effects which, when considered together, are either significant or "cumulatively considerable," meaning they add considerably to a significant environmental impact. Cumulative impacts can result from individually minor but collectively significant projects (*State CEQA Guidelines* Section 15355). An adequate cumulative impact analysis considers a project over time and in conjunction with other past, present, and reasonably foreseeable future projects whose impacts might compound those of the project being assessed.

According to the BAAQMD's *CEQA Air Quality Guidelines*, project emissions that do not exceed the BAAQMD emission thresholds would not have a significant cumulative impact whereas a proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact. The mass-based significance thresholds published by the BAAQMD are designed to ensure compliance with both NAAQS and CAAQS and are based on an inventory of projected emissions in the SFBAAB. As these are based on the projected growth in the SFBAAB, if a project is estimated to result in emissions that do not exceed the thresholds, the project's

contribution to the cumulative impact on air quality would not be substantial. As shown by the analysis in **Impacts AIR-1** and **AIR-2**, the construction and operational emissions of criteria pollutants associated with the proposed project would not exceed emission thresholds for ozone precursors and particulate matter, pollutants for which the air basin is in non-attainment. Therefore, both project alternatives would not result in a cumulatively considerable net increase of a criteria pollutant for which the project region is nonattainment under an applicable federal or State ambient air quality standard. The impact would be less than significant.

Mitigation Measures: No mitigation measures are required.

Cumulative Impact C-AIR-2: The proposed project, in conjunction with other past, present and reasonably foreseeable future development, would not result in significant cumulative community health risk. (*Less than Significant*)

The BAAQMD provides guidance as to the way the cumulative community health risk impact of a project may be analyzed. According to the *CEQA Air Quality Guidelines*, such a cumulative analysis must consider all existing and planned TAC sources within 1,000 feet of the project site and the project MEI. As noted in **Impact AIR-3**, the project MEI is a residential receptor located to the west of the project. All the existing and planned nearby TAC sources are described below, followed by an estimate of the cumulative community health risk at the MEI from exposure to these sources.

Cumulative Stationary Sources

To evaluate the cumulative health risk at the project MEI located to the west of the project site, a search of the BAAQMD database was conducted to identify all existing or planned stationary sources of TACs within 1,000 feet of both the project site and the MEI and no stationary sources were found. Rockville Terrace, a recently completed residential project, is located approximately 720 feet to the southwest of the MEI, and approximately 1,000 feet to the southwest of the project site. Although it is outside the zone of influence for the project site, it is anticipated that Rockville Terrace may have an on-site emergency diesel generator that could affect the MEI. Information about that generator is not available at this time. Therefore, it was conservatively assumed that this diesel generator could generate up to the maximum cancer risk of 10 in a million persons, and a PM2.5 concentration of 0.3 $\mu g/m^3$. At 720 feet which is the distance between Rockville Terrace and the MEI, the cancer risk from this source would be approximately 0.7 in a million persons, and a PM2.5 concentration of approximately 0.02 $\mu g/m^3$.

Cumulative Roadway Sources

Busy roadways near the project were evaluated using the BAAQMD *Roadway Screening Analysis Calculator* to estimate cancer risk, annual PM2.5, and non-cancer health hazard impacts. The roadway orientation (e.g., elevation, direction), side of the roadway proximate to the MEI, distance to the roadway, and traffic volume were entered to the calculator.

Although Interstate 80 (I-80) is approximately 1,400 feet from the MEI (and therefore beyond the 1,000-foot distance recommended for analysis by the BAAQMD), it is the nearest high-volume roadway and was included in the analysis. For a conservative analysis, this roadway was assumed to be 1,000 feet from the MEI. The maximum cancer risk from I-80 at the MEI is computed to be 11.2 in 1 million persons and the maximum annual PM2.5 concentration would be 0.2 $\mu g/m^3$.

Summary of Cumulative Community Health Risk Level Impacts

The combined cumulative community health risk levels were estimated at the MEI. This was conservatively assessed by adding the highest effects from stationary sources to the highest roadway effects, assuming the maximum effect from each source occurs at the same location.

The cumulative risk during construction includes construction emissions from the proposed project, off-site stationary sources, as well as emissions from Interstate 80. The estimated maximum cancer risk and PM2.5 concentration associated with each source are presented in **Table 4.1-8, Cumulative Community Health Risk Impacts due to Project Construction,** below.

Table 4.1-8
Cumulative Community Health Risk Impacts Due to Project Construction

Source	Estimated Cancer Risk (cases per million)	Non-cancer Health Risk/Hazard Index	Estimated PM2.5 Concentration ($\mu g/m^3$)
Project Construction (unmitigated)	38.8	<0.1	0.06
Rockville Terrace Emergency Generator	0.7	<0.1	0.02
I-80	11.2	<0.1	0.2
Total	**50.7**	**<0.1**	**0.3**
Cumulative Threshold	100 in one million	10	0.8
Threshold exceeded?	**No**	**No**	**No**

Source: Impact Sciences, 2018

As the table shows, these sources would combine to result in a cumulative cancer risk of approximately 50.7 in one million, and a PM2.5 concentration of approximately 0.3 $\mu g/m^3$ at the MEI. These values are

below the BAAQMD cumulative thresholds of cancer risk greater than 100 in one million persons and PM2.5 concentration greater than 0.8 μg/m^3. All values would be even lower with the implementation of **Mitigation Measure AIR-3** during project construction. The cumulative community health risk impact during project construction would be less than significant.

Cumulative Community Health Risk Level Impacts During Project Operations

The cumulative human health risk due to project operations includes the health risk associated with the on-site stationary source (diesel generator) included in the proposed project, risk associated with the off-site stationary source, as well as health risk from emissions from I-80. The estimated maximum cancer risk and PM2.5 concentrations associated with each source are presented in **Table 4.1-9, Cumulative Community Health Risk Impacts due to Project Operations,** below.

Table 4.1-9
Cumulative Community Health Risk Impacts due to Project Operations

Source	Estimated Cancer Risk (cases per million)	Non-cancer Health Risk/Hazard Index	Estimated PM2.5 Concentration (μg/m^3)
Project Emergency Generator	0.05	<0.1	0.01
Rockville Terrace Emergency Generator	0.7	<0.1	0.02
I-80	11.2	<0.1	0.2
Total	**11.95**	**<0.1**	**0.23**
Cumulative Threshold	100 in one million	10	0.8 μg/m^3
Threshold exceeded?	**No**	**No**	**No**

Source: Impact Sciences, 2018

As the table shows, these sources would combine to result in a cumulative cancer risk of approximately 12.0 in one million, and a PM2.5 concentration of approximately 0.3 μg/m^3 at the MEI, which are below the BAAQMD cumulative thresholds. Therefore, the cumulative community health risk impact during project operation would be less than significant.

Mitigation Measures: No mitigation is required.

4.1.6 REFERENCES

BAAQMD. 2017a. *Spare the Air – Cool the Climate: Final 2017 Clean Air Plan*. April.

BAAQMD. 2017b. *California Environmental Quality Act Air Quality Guidelines*. May.

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Fehr & Peers. April 2019. *Draft Transportation Impact Analysis Report Green Valley Mixed-Use Development.*

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