This section describes the regional air quality, current attainment status of the air basin, local sensitive receptors, emission sources, and impacts that are likely to result from project implementation. Following this discussion is an assessment of consistency of the proposed project with applicable policies and local plans. The Greenhouse Gases and Climate Change analysis is located in Section 3.7. Comments during the public review period and scoping meeting for the Notice of Preparation regarding this topic were provided from Patrick S. Blacklock (April 18, 2017).

This section is based in part on the following resources:

- *Air Quality and Land Use Handbook: A Community Health Perspective* (California Air Resources Board, 2005),
- *Handbook for Assessing and Mitigating Air Quality Impacts* (Yolo-Solano Air Quality Management District, 2007),
- *California Emissions Estimator Model* (CalEEMod v.2016.3.2) (CAPCOA, 2017).

3.3.1 ENVIRONMENTAL SETTING

ABBREVIATIONS

(AQAP)	Air Quality Attainment Plan
(AQMD)	Air Quality Management District
(ATCM)	Airborne Toxics Control Measure
(CARB)	California Air Resources Board
(CCAA)	California Clean Air Act
(CH&SC)	California Health and Safety Code
(CO)	Carbon monoxide
(EPA)	United States Environmental Protection Agency
(FCAA)	Federal Clean Air Act
(FHWA)	Federal Highway Administration
(HAPs)	Hazardous Air Pollutants
(NAAQS)	National Ambient Air Quality Standards
(NO_2)	Nitrogen dioxide
(NO_x)	Nitric oxide
(O_3)	Ozone

(Pb)	Lead
(PM)	Particulate matter
(PPM)	Parts per million
(ROG)	Reactive organic gases
(SIP)	State Implementation Plan
(SO_2)	Sulfur dioxide
(SVAB)	Sacramento Valley Air Basin
(TACs)	Toxic air contaminants
(TCMs)	Transportation control measures
(ug/m^3)	Micrograms per cubic meter
(VOC)	Volatile organic compounds
(YSAQMD)	Yolo-Solano Air Quality Management District

SACRAMENTO VALLEY AIR BASIN

Topography and Meteorology

The proposed project is located within the boundaries of the Sacramento Valley Air Basin (SVAB). The SVAB encompasses eleven counties including all of Shasta, Tehama, Glenn, Colusa, Butte, Sutter, Yuba, Sacramento, and Yolo Counties, the westernmost portion of Placer County and the northeastern half of Solano County. The SVAB is bounded by the North Coast Ranges on the west and Northern Sierra Nevada Mountains on the east. The intervening terrain is relatively flat.

Hot dry summers and mild rainy winters characterize the Mediterranean climate of the SVAB. During the year the temperature may range from 20 to 115 degrees Fahrenheit with summer highs usually in the 90s and winter lows occasionally below freezing. Average annual rainfall is about 19 inches, and the rainy season generally occurs from November through March. The prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north.

The mountains surrounding the SVAB create a barrier to airflow, which can trap air pollutants under certain meteorological conditions. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells collect over the Sacramento Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduces the influx of outside air and allows air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with temperature inversions that trap pollutants near the ground.

The ozone season (May through October) in the Sacramento Valley is characterized by stagnant morning air or light winds, with the delta sea breeze arriving in the afternoon out of the southwest. Usually the evening breeze transports the airborne pollutants to the north out of the Sacramento Valley. During about half of the days from July to September, however, a phenomenon called the "Schultz Eddy" prevents this from occurring. Instead of allowing for the prevailing wind patterns to move north carrying the pollutants out, the Schultz Eddy causes the wind pattern to circle back to the south. This phenomenon has the effect of exacerbating the pollution levels in the area and increases the likelihood of violating federal or state standards.

CRITERIA POLLUTANTS

The United States Environmental Protection Agency (EPA) uses six "criteria pollutants" as indicators of air quality, and has established for each of them a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called National Ambient Air Quality Standards (NAAQS). Each criteria pollutant is described below.

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

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

Carbon monoxide (CO) is a colorless, odorless and poisonous gas produced by incomplete burning of carbon in fuels. When CO enters the bloodstream, it reduces the delivery of oxygen to the body's organs and tissues. Health threats are most serious for those who suffer from cardiovascular disease, particularly those with angina or peripheral vascular disease. Exposure to elevated CO levels can cause impairment of visual perception, manual dexterity, learning ability and performance of complex tasks.

Nitrogen dioxide (NO_2) is a brownish, highly reactive gas that is present in all urban atmospheres. NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Nitrogen oxides are an important precursor both to ozone (O_3) and acid rain, and may affect both terrestrial and aquatic ecosystems. The major mechanism for the formation of NO_2 in

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

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

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

Based on studies of human populations exposed to high concentrations of particles (sometimes in the presence of SO_2) and laboratory studies of animals and humans, there are major effects of concern for human health. These include effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis and premature death.

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

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

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

Lead (Pb) exposure can occur through multiple pathways, including inhalation of air and ingestion of Pb in food, water, soil or dust. Excessive Pb exposure can cause seizures, mental retardation and/or behavioral disorders. Low doses of Pb can lead to central nervous system damage. Recent studies have also shown that Pb may be a factor in high blood pressure and subsequent heart disease.

ODORS

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

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

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

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

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

SENSITIVE RECEPTORS

A sensitive receptor is a location where human populations, especially children, seniors, and sick persons, are present and where there is a reasonable expectation of continuous human exposure

to pollutants. Examples of sensitive receptors include residences, hospitals and schools. The proposed project would include residences with sensitive receptors. Additionally, there are sensitive receptors located in the immediate vicinity of the proposed project to the east and south.

AMBIENT AIR QUALITY

Both the U.S. Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (CARB) have established ambient air quality standards for common pollutants. These ambient air quality standards represent safe levels of contaminants that avoid specific adverse health effects associated with each pollutant. Each pollutant is measured over several standardized timeframes (called the averaging times), which provide a standard to compare monitored levels of pollutants to the federal and state standards. Each criteria pollutant has more than one average time – for example, the state ambient air quality standard for ozone is monitored over both a 1-hour and 8-hour periods.

The federal and California state ambient air quality standards are summarized in Table 3.3-1 for important pollutants. The federal and state ambient standards were developed independently, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent. This is particularly true for ozone and particulate matter between 2.5 and 10 microns in diameter (PM_{10}).

The U.S. Environmental Protection Agency (U.S. EPA) established new national air quality standards for ground-level ozone and for fine particulate matter in 1997. The 1-hour ozone standard was phased out and replaced by an 8-hour standard of 0.08 PPM. Implementation of the 8-hour standard was delayed by litigation, but was determined to be valid and enforceable by the U.S. Supreme Court in a decision issued in February of 2001. More recently, the U.S. EPA reduced the 8-hour ozone standard from 0.08 PPM to 0.07 PPM (effective December 28, 2015).

TABLE 3.3-1: FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

POLLUTANT	*AVERAGING TIME*	*FEDERAL PRIMARY STANDARD*	*STATE STANDARD*
Ozone	1-Hour 8-Hour	-- 0.070 ppm	0.09 ppm 0.070 ppm
Carbon Monoxide	8-Hour 1-Hour	9.0 ppm 35.0 ppm	9.0 ppm 20.0 ppm
Nitrogen Dioxide	Annual 1-Hour	0.53 ppm 0.100 ppm	0.03 ppm 0.18 ppm
Sulfur Dioxide	Annual 24-Hour 1-Hour	0.03 ppm 0.14 ppm 75 ppb	-- 0.04 ppm 0.25 ppm
PM_{10}	Annual 24-Hour	-- 150 ug/m^3	20 ug/m^3 50 ug/m^3
$PM_{2.5}$	Annual 24-Hour	15 ug/m^3 35 ug/m^3	12 ug/m^3 --
Lead	30-Day Avg. Calendar Quarter	-- 1.5 ug/m^3	1.5 ug/m^3 --

NOTES: PPM = PARTS PER MILLION, PPB = PARTS PER BILLION, UG/M^3 = MICROGRAMS PER CUBIC METER
SOURCES: CALIFORNIA AIR RESOURCES BOARD, 2016A

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

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

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

Attainment Status

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

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

The U.S. EPA designates areas for ozone (O_3), carbon monoxide (CO), and nitrogen dioxide (NO_2) as "does not meet the primary standards," "cannot be classified," or "better than national standards." For sulfur dioxide (SO_2), areas are designated as "does not meet the primary standards," "does not meet the secondary standards," "cannot be classified," or "better than national standards." However, the CARB terminology of attainment, nonattainment, and unclassified is more frequently used.

Yolo County has a state designation of Nonattainment for ozone, PM_{10} and $PM_{2.5}$, and is either Unclassified or Attainment for all other criteria pollutants. Yolo County has a national designation of Nonattainment for ozone and PM_{10}, and Partial Nonattainment for $PM_{2.5}$. The County is designated either attainment or unclassified for all other criteria pollutants. Table 3.3-2 presents the state and national attainment status for Yolo County.

TABLE 3.3-2: STATE AND NATIONAL ATTAINMENT STATUS (YOLO COUNTY)

CRITERIA POLLUTANTS	*STATE DESIGNATIONS*	*NATIONAL DESIGNATIONS*
Ozone	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Unclassified
$PM_{2.5}$	Unclassified	Partial Nonattainment
Carbon Monoxide	Attainment	Unclassified/Attainment
Nitrogen Dioxide	Attainment	Unclassified/Attainment
Sulfur Dioxide	Attainment	Unclassified
Sulfates	Attainment	No Federal Standard
Lead	Attainment	Unclassified/Attainment
Hydrogen Sulfide	Unclassified	No Federal Standard
Visibility Reducing Particles	Unclassified	No Federal Standard

SOURCE: CALIFORNIA AIR RESOURCES BOARD, AIR QUALITY STANDARDS AND DESIGNATIONS, 2017A.

Sacramento Valley Air Basin Monitoring

CARB and the local air districts maintains numerous air quality monitoring sites throughout each county in the Air Basin to measure ozone, $PM_{2.5}$, and PM_{10}. It is important to note that while the federal ozone 1-hour standard was revoked by the EPA and is no longer applicable for federal standards, California maintains 1-hour ozone standards, and CARB collects 1-hour ozone data at most monitoring sites. Data obtained from the monitoring sites throughout Yolo County between 2006 and 2015 are summarized in Tables 3.3-3 through 3.3-5.

TABLE 3.3-3: YOLO COUNTY AMBIENT AIR QUALITY MONITORING DATA SUMMARY - OZONE 2006-2015

YEAR	*DAYS > STANDARD*				*1-HOUR OBSERVATIONS*			*8-HOUR AVERAGES*				*YEAR COVERAGE*	
	STATE		*NATIONAL*		*MAX.*	*STATE*	*NAT'L*	*STATE*		*NATIONAL*			
	1-HR	*8-HR*	*1-HR*	*'08 8-HR*		*D.V.[1]*	*D.V.[2]*	*MAX.*	*D.V.[1]*	*MAX.*	*'08 D.V.[2]*	*MIN*	*MAX*
2015	0	1	0	3	0.086	0.08	0.082	0.072	0.072	0.067	0.067	98	100
2014	0	1	0	0	0.082	0.09	0.086	0.072	0.076	0.071	0.068	92	98
2013	0	0	0	0	0.080	0.09	0.088	0.067	0.080	0.067	0.069	97	99
2012	1	9	0	2	0.101	0.09	0.088	0.080	0.080	0.080	0.069	97	98
2011	0	2	0	0	0.088	0.09	0.088	0.073	0.082	0.072	0.069	98	99
2010	0	0	0	0	0.087	0.10	0.096	0.069	0.088	0.069	0.072	85	98
2009	0	11	0	3	0.093	0.10	0.097	0.082	0.088	0.082	0.074	100	95
2008	4	12	0	4	0.100	0.11	0.106	0.088	0.091	0.087	0.079	96	96
2007	1	5	0	2	0.106	0.10	0.106	0.078	0.091	0.077	0.080	97	100
2006	6	23	0	14	0.106	0.10	0.102	0.091	0.091	0.090	0.079	99	100

NOTES: ALL CONCENTRATIONS EXPRESSED IN PARTS PER MILLION. THE NATIONAL 1-HOUR OZONE STANDARD WAS REVOKED IN JUNE 2005 AND IS NO LONGER IN EFFECT. STATISTICS RELATED TO THE REVOKED STANDARD ARE SHOWN IN ITALICS. D.V. [1] = STATE DESIGNATION VALUE. D.V. [2] = NATIONAL DESIGN VALUE. DATA TAKEN FROM THE WOODLAND-GIBSON ROAD AND DAVIS-UCD CAMPUS MONITORING STATIONS.

SOURCE: CALIFORNIA AIR RESOURCES BOARD, (ADAM) AIR POLLUTION SUMMARIES, 2016B.

TABLE 3.3-4: YOLO COUNTY AMBIENT AIR QUALITY MONITORING DATA SUMMARY - PM 2.5 2006-2015

YEAR	EST. DAYS > NAT'L '06 STD.	ANNUAL AVERAGE		NAT'L ANN. STD. D.V.[1]	STATE ANNUAL D.V.[2]	NAT'L '06 STD. 98TH PERCENTILE	NAT'L '06 24-HR STD. D.V.[1]	HIGH 24-HOUR AVERAGE		YEAR COVERAGE	
		NAT'L	STATE					NAT'L	STATE	MIN.	MAX.
2015	0.0	7.5	10.0	7.0	10	20.8	19	29.4	36.3	92	92
2014	0.0	5.9	*	6.6	6	13.2	16	14.6	14.6	82	82
2013	0.0	7.5	*	*	6	22.0	*	22.0	22.0	93	93
2012	0.0	6.4	6.4	*	6	14.2	*	14.6	14.6	96	96
2011	*	*	*	*	6	*	*	39.4	39.4	93	93
2010	0.0	5.7	5.7	*	10	18.6	*	26.7	26.7	96	96
2009	0.0	7.5	*	*	10	27.4	*	27.6	27.6	94	94
2008	*	*	9.7	*	10	*	*	41.9	41.9	92	92
2007	15.1	8.3	*	8.7	9	39.5	33	42.0	42.0	95	95
2006	12.3	9.3	9.3	9.4	10	36.0	30	44.0	44.0	95	95

NOTES: ALL CONCENTRATIONS EXPRESSED IN PARTS PER MILLION. STATE AND NATIONAL STATISTICS MAY DIFFER FOR THE FOLLOWING REASONS: STATE STATISTICS ARE BASED ON CALIFORNIA APPROVED SAMPLERS, WHEREAS NATIONAL STATISTICS ARE BASED ON SAMPLERS USING FEDERAL REFERENCE OR EQUIVALENT METHODS. STATE AND NATIONAL STATISTICS MAY THEREFORE BE BASED ON DIFFERENT SAMPLERS. STATE CRITERIA FOR ENSURING THAT DATA ARE SUFFICIENTLY COMPLETE FOR CALCULATING VALID ANNUAL AVERAGES ARE MORE STRINGENT THAN THE NATIONAL CRITERIA. D.V. [1] = STATE DESIGNATION VALUE. D.V. [2] = NATIONAL DESIGN VALUE. DATA TAKEN FROM THE WOODLAND-GIBSON ROAD AND DAVIS-UCD CAMPUS MONITORING STATIONS.

**= INDICATES THERE WAS INSUFFICIENT DATA AVAILABLE FOR CARB TO DETERMINE THE VALUE.*

SOURCE: CALIFORNIA AIR RESOURCES BOARD, (ADAM) AIR POLLUTION SUMMARIES, 2016B.

TABLE 3.3-5: YOLO COUNTY AMBIENT AIR QUALITY MONITORING DATA SUMMARY - PM 10 2006-2015

YEAR	EST. DAYS > STD.		ANNUAL AVERAGE		3-YEAR AVERAGE		HIGH 24-HR AVERAGE		YEAR COVERAGE
	NAT'L	STATE	NAT'L	STATE	NAT'L	STATE	NAT'L	STATE	
2015	0.0	12.2	21.5	21.8	20	23	70.8	69.4	100
2014	0.0	0.0	17.2	17.4	19	23	45.0	47.5	100
2013	0.0	23.2	22.4	22.9	19	23	60.3	61.5	99
2012	0.0	6.1	17.6	18.1	18	19	56.4	56.8	100
2011	0.0	6.1	18.4	19.1	19	21	53.2	56.6	98
2010	0.0	6.5	18.6	18.8	24	33	87.4	87.4	94
2009	0.0	12.2	20.5	21.1	26	33	64.6	64.0	96
2008	6.1	48.9	32.9	33.4	28	33	181.1	183.2	98
2007	0.0	18.7	25.2	25.3	25	26	119.0	119.0	95
2006	0.0	36.8	25.1	25.7	28	35	77.0	78.0	98

NOTES: THE NATIONAL ANNUAL AVERAGE PM_{10} STANDARD WAS REVOKED IN DECEMBER 2006 AND IS NO LONGER IN EFFECT. AN EXCEEDANCE IS NOT NECESSARILY A VIOLATION. STATISTICS MAY INCLUDE DATA THAT ARE RELATED TO AN EXCEPTIONAL EVENT. STATE AND NATIONAL STATISTICS MAY DIFFER FOR THE FOLLOWING REASONS: STATE STATISTICS ARE BASED ON CALIFORNIA APPROVED SAMPLERS, WHEREAS NATIONAL STATISTICS ARE BASED ON SAMPLERS USING FEDERAL REFERENCE OR EQUIVALENT METHODS. STATE AND NATIONAL STATISTICS MAY THEREFORE BE BASED ON DIFFERENT SAMPLERS. NATIONAL STATISTICS ARE BASED ON STANDARD CONDITIONS. STATE CRITERIA FOR ENSURING THAT DATA ARE SUFFICIENTLY COMPLETE FOR CALCULATING VALID ANNUAL AVERAGES ARE MORE STRINGENT THAN THE NATIONAL CRITERIA. DATA TAKEN FROM THE WOODLAND-GIBSON ROAD MONITORING STATION.

SOURCE: CALIFORNIA AIR RESOURCES BOARD, (ADAM) AIR POLLUTION SUMMARIES, 2016B.

3.3.2 REGULATORY SETTING

FEDERAL

Clean Air Act

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

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

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

Transportation Conformity

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

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

Transportation Control Measures

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

STATE

CARB Mobile-Source Regulation

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

CARB Air Quality and Land Use Handbook

CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* 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. 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).

California Clean Air Act

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

Air Quality Standards

NAAQS are determined by the EPA. The standards include both primary and secondary ambient air quality standards. Primary standards are established with a safety margin. Secondary standards are more stringent than primary standards and are intended to protect public health and welfare. States have the ability to set standards that are more stringent than the federal standards. As such, California established more stringent ambient air quality standards.

Federal and state ambient air quality standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulates (PM_{10}) and lead. In addition, California has created standards for pollutants that are not covered by federal standards. The state and federal primary standards for major pollutants are shown in Table 3.3-1.

Tanner Air Toxics Act

California regulates TACs primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs and has adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the CARB list of TACs. Once a TAC is identified, CARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate Best Available Control Technology (BACT) to minimize emissions.

The AB 2588 requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures. CARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators). In February 2000, CARB adopted a new public-transit bus-fleet rule and emission standards for new urban buses. These rules and standards provide for (1) more stringent emission standards for some new urban bus engines, beginning with 2002 model year engines; (2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and (3) reporting requirements under which transit agencies must demonstrate compliance with the urban transit bus fleet rule. Other recent milestones include the low-sulfur diesel-fuel requirement, and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide.

LOCAL

Yolo-Solano Air Quality Management District (YSAQMD)

YSAQMD attains and maintains air quality conditions in Yolo and Solano Counties through a comprehensive program of planning, regulation, enforcement, technical innovation, and

promotion of the understanding of air quality issues. The clean air strategy of YSAQMD includes the preparation of plans and programs for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. YSAQMD also inspects stationary sources, responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements other programs and regulations required by the CAA, CAAA, and CCAA.

YSAQMD HANDBOOK FOR ASSESSING AND MITIGATING AIR QUALITY IMPACTS

Nearly all development projects in the region have the potential to generate air pollutants that may increase the difficulty of attaining federal and State AAQS. Therefore, for most projects, evaluation of air quality impacts is required to comply with CEQA. In order to help public agencies evaluate air quality impacts, the YSAQMD has developed the H*andbook for Assessing and Mitigating Air Quality Impacts*. The YSAQMD's handbook includes screening methodology and recommended thresholds of significance, including mass emission thresholds for construction-related and operational ozone precursors (ROG and NO_X) and PM_{10}. The YSAQMD's handbook also includes screening criteria for localized CO emissions and thresholds for new stationary sources of TACs. The YSAQMD's recommended thresholds of significance, as well as screening criteria and methodology, are discussed in further detail in the Thresholds of Significance section below.

YSAQMD 2016 DRAFT TRIENNIAL ASSESSMENT AND PLAN UPDATE

In addition to the federal attainment plans discussed above for meeting NAAQS, the CCAA requires air districts to endeavor to achieve and maintain the CAAQS and develop plans for attainment. Yolo County meets the CAAQS for sulfur dioxide, nitrogen dioxide, and carbon monoxide, but is designated nonattainment for the State ozone and particulate matter standards. The CCAA requires districts that do not meet the State ozone standard to adopt an Air Quality Attainment Plan and to submit progress reports to the CARB every three years. The YSAQMD adopted the *2016 Draft Triennial Assessment and Plan Update* in July 2016, which assesses air quality data and includes a list of control measures the YSAQMD may take to ensure that the State standard for ozone is reached.

The YSAQMD is not required to prepare an attainment plan for PM_{10} or $PM_{2.5}$; however, the YSAQMD continues to work to reduce particulate emissions through rules affecting stationary sources, the construction industry, and the YSAQMD's agricultural burning program. The YSAQMD also works with the CARB to identify measures that can, where possible, reduce both ozone and particulate emissions. The YSAQMD has been proactive in attempts to implement the most readily available, feasible, and cost-effective measures that can be employed to reduce emissions of PM.

Because the proposed project is located within the nonattainment area for State ozone and PM standards, the project would be subject to any requirements set forth in the *2016 Draft Triennial Assessment and Plan Update* or YSAQMD efforts related to PM emissions, as enforced by YSAQMD through rules and regulations.

2013 REVISIONS TO THE SACRAMENTO REGIONAL 8-HOUR OZONE ATTAINMENT AND REASONABLE FURTHER PROGRESS PLAN

The most recent attainment plan for the ozone NAAQS is the *2013 Revisions to the Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan* (2013 Ozone Attainment Plan), which demonstrates how existing and new control strategies would provide the necessary future emission reductions to meet the federal NAAQS. The SVAB's attainment deadline is 2027. Because the proposed project is located within the nonattainment area for ozone, the project would be subject to the requirements set forth in the 2013 Ozone Attainment Plan, as enforced by YSAQMD through rules and regulations.

YSAQMD RULES AND REGULATIONS

All projects are subject to adopted YSAQMD rules and regulations in effect at the time of construction. Specific rules applicable to the construction of the project may include but are not limited to the following:

- **Rule 2.3—(Ringelmann Chart)**. This rule prohibits stationary diesel-powered equipment from generating visible emissions that would exceed the rule's visibility threshold.
- **Rule 2.5—(Nuisance)**. This rule prohibits any source from generating air contaminants or other materials that would that would cause injury, detriment, nuisance, or annoyance to the public; endanger the comfort, repose, health, or safety of the public; or damage businesses or property.
- **Rule 2.11—(Particulate Matter Concentration)**. This rule prohibits any source that would emit dust, fumes, or total suspended particulate matter from generated emissions that would exceed the rule's established emission concentration limit.
- **Rule 2.14—(Architectural Coatings)**. This rule establishes volatile organic compound (VOC) content limits for all architectural coatings supplied, sold, offered for sale, applied, solicited for application, or manufactured within YSAQMD's jurisdiction.
- **Rule 2.28—(Cutback and Emulsified Asphalts)**. This rule establishes organic compound limits for cutback and emulsified asphalts manufactured, sold, mixed, stored, used, and applied within YSAQMD's jurisdiction.
- **Rule 2.40—(Wood Burning Appliances)**. This rule prohibits installation of open hearth wood burning fireplaces in any new development (residential or commercial, single or multi-family units). New developments may only use either a pellet-fueled heater, a U.S. EPA Phase II certified wood burning heater or a gas fireplace.
- **Rule 2.37—(Natural Gas-Fired Water Heaters and Small Boilers)**. This rule establishes NO_X emission limits for natural gas-fired water heaters with a rated heat input capacity less than 1,000,000 British Thermal Units per hour—(Btu/hour) manufactured, offered for sale, sold, or installed within YSAQMD's jurisdiction.
- **Rule 3.1—(General Permit Requirements)**. This rule establishes permitting processes (i.e., Authority to Construct and Permit to Operate) to review new and modified sources of air pollution.

- **Rule 3.4—(New Source Review)**. This rule would require any new or modified stationary source that generates emissions that exceed established emissions limits for each pollutant (i.e., ROG, NO_X, sulfur oxides [SO_X], PM_{10}, CO, and lead) to comply with Best Available Control Technology and emissions offset requirements.
- **Rule 3.13—(Toxics New Source Review)**. This rule requires the installation of best available control technology for toxics (T-BACT) at any constructed or reconstructed major source of TACs.

City of Davis General Plan

The Air Quality Element of the City's General Plan (amended through January 2007) contains goals, policies, and actions that pertain to CAP emissions, TACs, and odors (City of Davis, 2007). Key goals and policies applicable to the project include the following:

AIR QUALITY

Goal AIR 1. Maintain and strive to improve air quality.

Policy AIR 1.1. Take appropriate measures to meet the AQMD's goal for improved air quality.

City of Davis Municipal Code

40.24.040 Specified.

- c) Odors. No emission shall be permitted of odorous gases or other odorous matter in such quantities as to be readily detectable when diluted in the ratio of one volume of odorous air to four volumes of clean air at the points of measurement specified in section 40.24.030 or at the point of greatest concentration. Any process which may involve the creation or emission of any odors shall be provided with a secondary safeguard system, so that control will be maintained if the primary safeguard system should fail. There is hereby established as a guide in determining such quantities of offensive odors, Table iii, "odor thresholds," in Chapter 5, "Air Pollution Abatement Manual," Copyright 1951, by Manufacturing Chemists' Association, Inc., of Washington, D.C. and such manual or table as subsequently amended.

3.3.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines and the YSQAMD's *Handbook for Assessing and Mitigating Air Quality Impacts* (2007), the proposed project will have a significant impact on the environment associated with air quality if it will:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Cause a violation of any 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 in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people.

Impacts related to greenhouse gases and climate change are addressed in Section 3.7.

The YSAQMD's *Handbook for Assessing and Mitigating Air Quality Impacts* (2007) provides project-level thresholds of significance for: particulate matter less than 10 micrometers in diameter (PM_{10}), carbon monoxide (CO), and the precursors to ozone, which are reactive organic gases (ROG) and nitrogen oxides (NOx). The thresholds apply to both construction and operational impacts.

TABLE 3.3-6: THRESHOLDS OF SIGNIFICANCE FOR CRITERIA POLLUTANTS OF CONCERN

POLLUTANT	*THRESHOLDS OF SIGNIFICANCE*
ROG	10 tons/year
NOx	10 tons/year
PM_{10}	80 lbs/day
CO	Violation of a state ambient air quality standard for CO

SOURCE: YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT'S HANDBOOK FOR ASSESSING AND MITIGATING AIR QUALITY IMPACTS (2007)

METHODOLOGY

Operational Emissions

There are three types of emission sources: area sources, mobile sources, and stationary sources. These collectively make up the project's operational emissions. The methodology used in this analysis to address each source is presented below.

AREA SOURCES

The term area source emissions refer to equipment or devices operating within a project that individually emit small quantities of air pollutants, but when considered collectively, represent large quantities of emissions. Examples include electricity and natural gas consumption, water and space heaters, fireplaces, wood burning heaters, lawn maintenance equipment, and application of paints and lacquers. The California Emission Estimator Model (CalEEMod)™ (v.2016.3.2) was used to estimate area source emissions.

The land use inputs for CalEEMod were derived from the project description, which includes information provided by the City of Davis and the Project Applicant. The CalEEMod land use inputs include:

- Residential:
    - Single Family Housing (77 dwelling units)
    - Retirement Community (303 dwelling units)
    - Congregate Care (Assisted Living) (30 dwelling units)
    - Apartments Low Rise (150 dwelling units)
- Recreational:
    - City Park (1.1 acres)
    - Health Club (8,000 square feet)
    - High Turnover (Sit Down Restaurant) (5,000 square feet)

MOBILE SOURCES

The term mobile source emissions refer to vehicle emissions generated by a project. Mobile source emissions are dependent on a large number of variables including trip length, average speed, trip generation rates, vehicle fleet mix, starting conditions, temperature, year, and other factors.

CalEEMod was used to estimate mobile source emissions. The traffic inputs were derived from the traffic analysis. The traffic inputs include trip generation rates as included within the Traffic Study provided by Fehr & Peers (Fehr & Peers, 2017).

STATIONARY SOURCES

The term stationary source emissions refer to equipment or devices operating at industrial and commercial facilities. Examples of facilities with stationary sources include manufacturing plants, quarries, print shops and gasoline stations. The proposed project does not propose stationary source emitters; therefore, this air quality analysis does not include stationary source emission estimates.

Construction Emissions

Construction activities can generate a substantial amount of air pollution. In some cases, the emissions from construction represent the largest air quality impact associated with a project. While construction-related emissions are considered temporary, these short-term impacts can contribute to the pollution load recorded at monitoring stations. Emissions from construction are assessed in this document to determine whether the thresholds of significance established by the YSAQMD would be exceeded.

Construction activities would include: site preparation, grading, building construction, paving, and architectural coatings. The emissions generated from these common construction activities include fugitive dust from soil disturbance, fuel combustion from mobile heavy-duty diesel and gasoline-powered equipment, portable auxiliary equipment, and worker commute trips.

CalEEMod was used to estimate the construction emissions from construction activities. Based on construction phasing and schedule, the CalEEMod defaults for construction equipment were utilized.

IMPACTS AND MITIGATION MEASURES

Impact 3.3-1: Project operations have the potential to cause a violation of any air quality standard or contribute substantially to an existing or projected air quality violation (Significant and Unavoidable)

The proposed project would be a direct and indirect source of air pollution, in that it would generate and attract vehicle trips in the region (mobile source emissions), require the use of grid energy (natural gas and electricity), and generate area source emissions. The mobile source emissions would be entirely from vehicles, while the area source emissions would be primarily from landscape fuel combustion, consumer products, and architectural coatings.

CalEEMod was used to estimate operational emissions for the proposed project, without any mitigation measures incorporated. Table 3.3-7 shows the operational emissions, which includes both mobile and area source emissions of criteria pollutants that would result from the proposed project. Detailed CalEEMod emissions calculations are presented in Appendix B.

TABLE 3.3-7: PROJECT OPERATIONAL EMISSIONS (UNMITIGATED SCENARIO)

EMISSIONS[A]	*ROG (TONS/YEAR)*	*NOX (TONS/YEAR)*	*PM_{10} (LBS/DAY)*[B]	*CO (TONS/YEAR)*
Area	70.6908	1.2427	288.0215	88.0231
Energy	0.0435	0.3740	0.1648	0.1733
Mobile	0.9548	7.1290	972.1987	9.7482
Total	**71.6891**	**8.7457**	**1,260.3847**	**97.9446**
Threshold	**10**	**10**	**80**	**Violation of State Ambient Air Quality Standard for CO**
Above Threshold?	**Y**	**N**	**Y**	**See Impact 3.3-3**

NOTE: [A] NUMBERS PROVIDED HERE MAY NOT ADD UP EXACTLY TO TOTAL DUE TO ROUNDING. [B] MAXIMUM VALUE.
SOURCE: CALEEMOD (V.2016.3.2)

The YSAQMD has established an operational emissions threshold of significance for ozone precursors of 10 tons per year for ROG and NO_X, and 80 pounds per day for PM_{10}. The YSAQMD utilizes a screening process and separate model for CO impacts. As shown in the table above, project generated emissions would be above the YSAQMD 10 tons per year threshold for ROG and the 80 pounds per day threshold for PM_{10}. Therefore, the project could result in a ***potentially significant*** impact. However, the proposed project would include the following project components (written as provided by CalEEMod) that would reduce project operational emissions below the unmitigated scenario as provided in Table 3.3-7.

- Increase density to 7.51 dwelling units per acre (based on 560 dwelling units proposed for the proposed 74.49-acre development area of the project site);
- Increase transit accessibility (project site within 0.1 miles to nearest transit (bus) station);
- Improve pedestrian network (project site and connecting off-site);
- No hearths.

Additionally, the proposed project would incorporate the following mitigation, as provided within CalEEMod:

- Use Low VOC Cleaning Supplies;
- Use Low VOC Paint (EF of less than 100 g/L for residential interior and, residential exterior, and 150 g/L for non-residential interior, non-residential exterior, parking);
- Install metal halide post top lights, metal halide cobrahead/cutoff lights, high-pressure sodium cutoff lights, or LED lights (for outdoor lighting);
- Install low-flow appliances (bathroom faucet, kitchen faucet, toilet, and shower); and
- Use water-efficient irrigation systems.

As shown in Table 3.3-8, below, incorporation of these project components and mitigation measures (listed above) would reduce project-related operational emissions by an estimated 94.7% for ROG, 18.3% for NO_x, and 31.9% for PM_{10}, as calculated using CalEEMod (v.2016.3.2). The greatest percentage reductions occur within the Area emissions category (for ROG, NO_x, and PM_{10}).

TABLE 3.3-8: PROJECT OPERATIONAL EMISSIONS (MITIGATED SCENARIO)

EMISSIONS CATEGORY[A]	*ROG (TONS/YEAR)*	*NOX (TONS/YEAR)*	*PM_{10} (LBS/DAY)*[B]	*CO (TONS/YEAR)*
Area	2.8504	0.0453	0.2410	3.9248
Energy	0.0378	0.3247	0.1430	0.1511
Mobile	0.9160	6.7722	857.4825	8.9289
Total[B]	**3.8042**	**7.1421**	**857.8665**	**13.0048**
Threshold	**10**	**10**	**80**	**Violation of State Ambient Air Quality Standard for CO**
Above Threshold?	**N**	**N**	**Y**	**See Impact 3.3-3**

NOTE: [A] NUMBERS PROVIDED HERE MAY NOT ADD UP EXACTLY TO TOTAL DUE TO ROUNDING. [B] MAXIMUM VALUE.

SOURCE: CALEEMOD (V.2016.3.2)

The percent reductions achieved by these project components and mitigation measures and the project's design features would bring the operational source emissions below the below the YSAQMD threshold of significance for ROG. NOx would remain below the applicable YSAQMD threshold. However, PM_{10} would remain above the applicable YSAQMD threshold. This is due to the number of mobile vehicle trips generated by the proposed project. The mobile emissions category constitutes the vast majority of PM_{10} emissions during project operations. Although reduced under the mitigated scenario, mobile PM_{10} emissions would cause operation-related PM_{10} emissions to remain above the applicable threshold. The proposed project would be required to implement Mitigation Measure 3.3-1.

MITIGATION MEASURE(S)

Mitigation Measure 3.3-1: *Prior to the issuance of each building permit, the project applicant shall ensure that the project incorporates the following:*

- *Require the use Low VOC Cleaning Supplies during project operation*

- *Require the use of low VOC Paint (VOC emission factor of below 100 g/L for residential interiors exteriors, and below 150 g/L for non-residential interior, non-residential exterior, parking).*
- *For outdoor lighting, utilize energy efficient lighting, such as metal halide post top lights, metal halide cobrahead/cutoff lights, LED lights, and/or high-pressure sodium cutoff lights, in place of traditional typical mercury cobrahead lights.*
- *Require the use of low-flow appliances (including for the bathroom faucet, kitchen faucet, toilet, and shower).*
- *Require the use water-efficient irrigation systems.*

SIGNIFICANCE AFTER MITIGATION

Implementation of Mitigation Measure 3.3-1 would reduce proposed project operation-related criteria pollutant emissions. In addition, implementation of Mitigation Measure 3.7-1, as provided in Chapter 3.7, "Greenhouse Gas Emissions", would reduce these emissions further. However, even after mitigation measures are applied, proposed project PM_{10} emissions would be above the YSAQMD threshold. Therefore, there is a ***significant and unavoidable*** impact relative to this topic.

Impact 3.3-2: Project construction has the potential to cause a violation of an air quality standard or contribute substantially to an existing or projected air quality violation (Less than Significant with Mitigation)

Construction activities associated with construction and implementation of the proposed project would result in temporary short-term emissions associated with vehicle trips from construction workers, operation of construction equipment, and the dust generated during construction activities. These temporary and short-term emissions would generate additional ozone precursors (ROG and NO_x) as well as PM_{10}, which could exacerbate the County's existing non-attainment status for these criteria pollutants. It should be noted that construction vehicle emissions requirements in California have become stricter over time. Below is an estimated construction schedule for the proposed project:

- Site Preparation (April 1, 2020 – May 11, 2020)
- Grading: (May 12, 2020 – August 24, 2020)
- Building Construction: (August 25, 2020 – June 25, 2023)
- Paving: (June 26, 2021 – September 10, 2021)
- Architectural Coating: (September 11, 2021 – August 27, 2023)

CalEEMod was used to estimate construction emissions for the proposed project. Table 3.3-9 shows the construction emissions that would result from the proposed project. Detailed CalEEMod emissions calculations are presented in Appendix B.

TABLE 3.3-9: PROJECT CONSTRUCTION EMISSIONS (UNMITIGATED SCENARIO)

EMISSIONS YEAR	*ROG (TONS/YEAR)*	*NOX (TONS/YEAR)*	*PM_{10} (LBS/DAY)[A]*	*CO (TONS/YEAR)*
2020	0.4002	3.7838	378.8745	2.8107
2021	1.0446	3.3533	446.4530	3.5524
2022	2.3777	3.1849	446.2881	3.7066
2023	1.4994	1.6949	460.0231	2.2093
Maximum	**2.3777**	**3.7838**	**460.0231**	**3.7066**
Threshold	**10**	**10**	**80**	**Violation of State Ambient Air Quality Standard for CO**
Above Threshold?	**N**	**N**	**Y**	**See Impact 3.3-3**

NOTE: [A] MAXIMUM VALUE

The YSAQMD has established a construction emissions threshold of significance for ozone precursors of 10 tons per year for ROG and NO_X, and 80 pounds per day for PM_{10}. The YSAQMD utilizes a screening process and separate model for CO impacts. As shown in the table above, construction emissions of ROG would be at its maximum in year 2022, with approximately 2.3777 tons of ROG, which is below the 10 tons per year threshold for ROG. Year 2020 would be the peak year for construction emissions of NO_x, with approximately 3.7838 tons of NO_x in that year, which is below the 10 tons per year threshold for NO_x. PM_{10} construction emissions remain above the 80 pounds per day threshold for PM_{10}, with a maximum of 446.4530 pounds per day in 2021. This is a ***potentially significant*** impact.

YSAQMD advises that projects exceeding project construction emissions thresholds should implement best management practices to reduce dust emissions and avoid localized health impacts that could be generated by dust. Approximately 99 percent of the PM_{10} emissions during the construction emissions years would be related to PM_{10} dust, with the remainder related to PM_{10} exhaust. The YSAQMD recommends the use of construction dust mitigation measures to reduce PM_{10} emissions during construction. The YSAQMD's *Handbook for Assessing and Mitigating Air Quality Impacts* (2007) provides a list of dust mitigation measures along with their effectiveness at reducing PM_{10} emissions. Below is a list of construction dust mitigation reduction assumptions used for this analysis.

TABLE 3.3-10: CONSTRUCTION DUST MITIGATION REDUCTION ASSUMPTIONS

MITIGATION MEASURE	*SOURCE CATEGORY*	*EFFECTIVENESS*	*REFERENCES*
Water all active construction sites at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure.	Fugitive emissions from active, unpaved construction areas	50%	U.S. EPA, AP-42
Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed area.	Wind erosion from inactive areas	Up to 80% (assumed 60%)	U.S. EPA, AP-42
Sweep streets if visible soil material is carried out from the construction site.	On-road entrained PM_{10}	14%	U.S. EPA Report Number EPA-600/R-95-171
Treat accesses to a distance of 100 feet from the paved road with a 6-inch layer of gravel.	Mud/dirt carryout on-road entrained PM_{10}	42-52% (assumed 42%)	U.S. EPA Report Number EPA-600/R-95-171

SOURCE: YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT'S HANDBOOK FOR ASSESSING AND MITIGATING AIR QUALITY IMPACTS (2007)

CalEEMod allows the selection of Mitigation Measures that would reduce project-related construction PM_{10} emissions. The following Mitigation Measures and parameters were used within CalEEMod to calculate reductions in PM_{10}, consistent with the dust Mitigation Measures listed in Table 3.3-10 above:

- Soil Stabilizer for Unpaved Roads (60% Fugitive Dust PM_{10} reduction);
- Water Exposed Area three times daily (61% Fugitive Dust PM_{10} reduction);
- Clean Paved Road (14% Fugitive Dust PM reduction).

Additional Mitigation Measures were applied in CalEEMod:

- Unpaved Road Mitigation: Limit on-site construction vehicle speeds to 5 mph.

Implementation of the CalEEMod dust mitigation listed above, which is consistent with the Mitigation Reduction Assumptions listed in Table 3.3-10 above, would reduce project-related construction PM_{10} emissions to an estimated total of a maximum of approximately 69 pounds per day during the construction timeframe (an approximately 85% reduction from unmitigated project-related PM_{10} emissions), which is below the 80 pounds per day threshold. Therefore, with implementation of the following mitigation measure, which is consistent with the CalEEMod Mitigation listed above, the proposed project would have a ***less than significant*** impact as it relates to construction emissions.

MITIGATION MEASURE(S)

Mitigation Measure 3.3-2: *The project applicant shall implement the following dust control measures during all construction activities. These measures shall be incorporated as part of the building and grading plans.*

- *Water all active construction sites at least three times daily. Frequency should be based on the type of operation, soil, and wind exposure.*
- *Apply water or dust palliatives on exposed earth surfaces as necessary to control dust emissions. Construction contracts shall include dust control treatment in late morning and at the end of the day, of all earth surfaces during clearing, grading, earth moving, and other site preparation activities. Non-potable water shall be used, where feasible. Existing wells shall be used for all construction purposes where feasible. Excessive watering will be avoided to minimize tracking of mud from the project onto streets as determined by Public Works.*
- *Grading operations on the site shall be suspended during periods of high winds (i.e. winds greater than 15 miles per hour).*
- *Outdoor storage of fine particulate matter on construction sites shall be prohibited.*
- *Contractors shall cover any stockpiles of soil, sand and similar materials. There shall be no storage of uncovered construction debris for more than one week.*
- *Re-vegetation or stabilization of exposed earth surfaces shall be required in all inactive areas in the project.*

- *Cover all trucks hauling dirt, sand, or loose materials, or maintain at least two feet of freeboard within haul trucks.*
- *Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed area (as applicable).*
- *Sweep streets if visible soil material is carried out from the construction site.*
- *Treat accesses to a distance of 100 feet from the paved road with a 6-inch layer of gravel.*
- *Reduce speed on unpaved roads to less than 5 miles per hour.*

SIGNIFICANCE AFTER MITIGATION

Implementation of Mitigation Measure 3.3-2 would ensure all applicable dust mitigation is applied, which would reduce the potential impact to construction emissions to a ***less than significant*** level.

Impact 3.3-3: Carbon monoxide hotspot impacts (Less than Significant)

Project traffic would increase concentrations of carbon monoxide along streets providing access to the project. Carbon monoxide is a local pollutant (i.e., high concentrations are normally only found very near sources). The major source of carbon monoxide, a colorless, odorless, poisonous gas, is automobile traffic. Elevated concentrations (i.e. hotspots), therefore, are usually only found near areas of high traffic volume and congestion.

The CO screening approach outlined in the YSAQMD's *Handbook for Assessing and Mitigating Air Quality Impacts* (2007) was used to estimate whether or not the proposed project's traffic impact would cause a potential CO hotspot. The CO screening approach uses the following screening criteria:

- Does the peak-hour Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity reduce to an unacceptable LOS (typically LOS E or F[1])? or
- Will the proposed project substantially worsen an already existing peak-hour LOS F on one or more streets or at one or more intersections in the project vicinity? (Note: This includes situations where the average delay would increase by 10 seconds or more when project-generated traffic is included.)

If the answer to the screening criteria is "yes," then the proposed project can be said to have the potential to create a violation of the CO standard and further modeling may be warranted. If the answer to the screening criteria is "no," then further modeling is not warranted and the proposed project would not create a violation of the CO standard.

The traffic impact analysis contained in Section 3.14 examined Level of Service (LOS) for intersections and road segments affected by the proposed project. As shown throughout Section

[1] The City of Davis has generally established LOS E as the significance level for intersection operations within the City. However, LOS F is acceptable in the downtown core area, and within areas with a corridor plan. A corridor plan is currently being prepared for East Covell Blvd., adjacent to the project site. As such, LOS F was used in the CO screening analysis.

3.14 of this EIR, the proposed project would not reduce peak-hour LOS on any streets or intersections to an unacceptable LOS, or substantially worsen an already existing peak-hour LOS F on any streets or intersections, during the non-cumulative scenarios.

However, under the cumulative scenario, the proposed project would cause greater than a 10-second increase in PM peak hour delay to the following study intersections, which are projected to operate at LOS F under cumulative conditions without the project:

- West Covell Boulevard/SR 113 NB Ramps (LOS F) – project-added traffic would cause an 11-second increase in delay.
- West Covell Boulevard/Sycamore Lane (LOS F) – project-added traffic would cause a 20-second increase in delay.

Separately, under cumulative conditions, the proposed project would contribute to vehicular queuing that extends from the SR 113 northbound off-ramp at West Covell Boulevard onto the SR 113 freeway mainline. Traffic impacts for CO Hotspots are discussed further under Section 4.0: Other CEQA Required Topics.

However, the cumulative conditions scenario is speculative (in that it is unclear that all of these proposed projects would be built by the buildout timeframe, if at all). Moreover, traffic volumes for the intersections and freeway facility under cumulative conditions, as identified by the traffic analysis (see Section 3.14 of this EIR), does not rise to a level sufficient to feasibly cause a CO Hotspot impact. The potential for the creation of a CO hotspot would require a roadway segment or intersection with peak hour traffic volumes in the tens of thousands. However, there are no traffic intersections or roadways that would be affected the proposed project that would reach this level of traffic volume (Fehr & Peers, 2017); therefore, there is no potential for the creation of a CO hotspot that would result in violations of applicable ambient air quality standards, and further modeling is not warranted.

Since the project is within an attainment area for carbon monoxide (ambient air quality standards are currently attained) and in an area with low background concentrations, and since it is not expected that a CO hotspot would be generated by the proposed project under cumulative and non-cumulative scenarios, changes in carbon monoxide levels resulting from the proposed project would not result in violations of the ambient air quality standards, and would represent a ***less than significant*** impact.

Impact 3.3-4: Potential for public exposure to toxic air contaminants (Less than Significant)

The screening approach outlined in the YSAQMD's *Handbook for Assessing and Mitigating Air Quality Impacts* (2007) was used to estimate whether or not the proposed project would result in air quality impacts associated with land use conflicts and sensitive receptors. The screening approach uses the project location relative to other uses to determine if there is the potential for localized air quality impacts. Localized air pollution impacts generally occur in one of two ways:

1. a (new) source of air pollutants is proposed to be located close to existing receptors. For example, an industrial facility is proposed for a site near a school; or
2. a (new) development project with receptors is proposed near an existing source of air pollutants. For example, a hospital is proposed for a site near an industrial facility.

The amount of emissions, the proximity between the emissions source and the nearest receptor, the direction of prevailing winds, and local topography can all influence the severity of a localized impact. The most frequent impacts are those related to: Toxic Air Contaminants (TACs), Odors, and Construction Dust.

TACs

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

The California Air Resources Board (ARB) published the *Air Quality and Land Use Handbook: A Community Health Perspective* (2007) to provide information to local planners and decision-makers about land use compatibility issues associated with emissions from industrial, commercial and mobile sources of air pollution. The ARB Handbook indicates that mobile sources continue to be the largest overall contributors to the State's air pollution problems, representing the greatest air pollution health risk to most Californians. The most serious pollutants on a statewide basis include diesel exhaust particulate matter (diesel PM), benzene, and 1,3-butadiene, all of which are emitted by motor vehicles. These mobile source air toxics are largely associated with freeways and high traffic roads. Non-mobile source air toxics are largely associated with industrial and commercial uses. Table 3.3-11 provides the California Air Resources Board minimum separation recommendations on siting sensitive land uses.

The proposed project does not include any of the source categories listed in Table 3.3-11. The proposed project does not include the long-term operation of any other major onsite stationary sources of TACs. In addition, no major stationary sources of TACs have been identified in the immediate vicinity of the project site. The project site is not located adjacent to a freeway or high traffic road that is considered a significant source of mobile source air toxics. The closest traffic facility that poses a risk from mobile source air toxics is State Route (SR) 113, located approximately 1,300 feet to the east of the project site. Implementation of the proposed project would not be anticipated to result in an increased exposure of sensitive receptors to localized concentrations of TACs that would exceed the relevant standards or thresholds. Therefore, this proposed project would have a ***less than significant*** impact on sensitive receptors.

TABLE 3.3-11: CARB MINIMUM SEPARATION RECOMMENDATIONS ON SITING SENSITIVE LAND USES

SOURCE CATEGORY	*ADVISORY RECOMMENDATIONS*
Freeways and High-Traffic Roads	• Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
Distribution Centers	• Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week). • Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points.
Rail Yards	• Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. • Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	• Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or the ARB on the status of pending analyses of health risks.
Refineries	• Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	• Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloro- ethylene	• Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district. • Do not site new sensitive land uses in the same building with perc dry cleaning operations.
Gasoline Dispensing Facilities	• Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50 foot separation is recommended for typical gas dispensing facilities.

SOURCE: YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT'S HANDBOOK FOR ASSESSING AND MITIGATING AIR QUALITY IMPACTS (2005)

DUST/PARTICULATE MATTER

The proposed project requires earthmoving during the project's construction phase. The majority of earthmoving would be associated with clear and grub, rough grading, trench/backfill, final grading, and building construction activities.

These construction activities would result in temporary dust generation (PM_{10}). Without control, dust emissions can create nuisances or localized health impacts. CalEEMod was used to estimate construction PM_{10} emissions for the proposed project. Construction emissions are discussed in more detail under Impact 3.3-2, Construction Impacts. Detailed CalEEMod emissions calculations are presented in Appendix B. Mitigation Measure 3.3-2 requires the implementation of construction dust mitigation measures to reduce PM_{10} emissions during construction. This mitigation measure is consistent with the recommendations of the YSAQMD in *Handbook for Assessing and Mitigating Air Quality Impacts* (2007). Below is a list of the best management practices that are required under this mitigation measure.

- Water all active construction sites at least three times daily. Frequency should be based on the type of operation, soil, and wind exposure.
- Apply water or dust palliatives on exposed earth surfaces as necessary to control dust emissions. Construction contracts shall include dust control treatment in late morning and at the end of the day, of all earth surfaces during clearing, grading, earth moving, and

other site preparation activities. Non-potable water shall be used, where feasible. Existing wells shall be used for all construction purposes where feasible. Excessive watering will be avoided to minimize tracking of mud from the project onto streets as determined by Public Works.

- Grading operations on the site shall be suspended during periods of high winds (i.e. winds greater than 15 miles per hour).
- Outdoor storage of fine particulate matter on construction sites shall be prohibited.
- Contractors shall cover any stockpiles of soil, sand and similar materials. There shall be no storage of uncovered construction debris for more than one week.
- Re-vegetation or stabilization of exposed earth surfaces shall be required in all inactive areas in the project. Cover all trucks hauling dirt, sand, or loose materials.
- Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed area.
- Sweep streets if visible soil material is carried out from the construction site.
- Treat accesses to a distance of 100 feet from the paved road with a 6-inch layer of gravel.
- Reduce speed on unpaved roads to less than 5 miles per hour.

Implementation of the dust mitigation required under Mitigation Measure 3.3-2, and as reprinted in the above bullet list, would ensure that dust emissions are below the YSAQMD thresholds, and that the proposed project would have a ***less than significant*** impact with regard to dust and/or particulate matter.

Impact 3.3-5: Potential for exposure to odors (Less than Significant)

While offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and the YSAQMD. The general nuisance rule (Heath and Safety Code §41700 and YSAQMD District Rule 2.5) is the basis for the YSAQMD threshold. A project may reasonably be expected to have a significant adverse odor impact where it "generates odorous emissions in such quantities as to cause detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which may endanger the comfort, repose, health, or safety of any such person or the public, or which may cause, or have a natural tendency to cause, injury or damage to business or property."

As discussed under Impact 3.3-4, implementation of the proposed project would not place sensitive receptors adjacent to known toxic air contaminants above the applicable standards and thresholds. Similarly, implementation of the proposed project would not directly create or generate objectionable odors to a significant degree. The proposed project would also not place sensitive receptors near objectionable odors. Trash in enclosed areas would be separated at a sufficient distance from nearby residences, and enclosed in industry-standard containers, such that odors from trash would not generally generate noticeable odors for nearby residential receptors. The two closest producers of odors include the Yolo County Landfill located northwest of the County Road 104 and County Road 28H intersection, and the Davis Waste Water Treatment facility located on County Road 28H just east of County Road 105. These facilities are located

approximately 4.66 and 5.60 miles away from the project site, respectively. This distance is beyond the screening distance of one mile that is recommended by the YSAQMD. There are no other known producers of odors within vicinity of the project site. Therefore, this impact is considered ***less than significant***.