4.3 AIR QUALITY

4.3.1 INTRODUCTION

The Air Quality section of the EIR describes the effects of the proposed project on local and regional air quality. The section includes a discussion of existing air quality conditions and applicable regulations, estimation of emissions that would be generated during the construction and operation phases of the proposed project, comparison of the project's projected emissions with relevant thresholds of significance, and identification of impacts and mitigation measures intended to reduce all impacts to the maximum extent feasible. It should be noted that future development associated with the proposed project would include preparation, and adherence to, a sustainability plan. The impact analysis herein does not rely upon a future sustainability plan, and, therefore, presents a worst-case analysis. The Air Quality section is primarily based on information, guidance, and analysis protocol provided by the Yolo-Solano Air Quality Management District (YSAQMD) per the *Handbook for Assessing and Mitigating Air Quality Impacts*,[1] as well as emissions projections obtained by means of the California Emissions Estimator Model (CalEEMod) version 2013.2.2.[2] In addition, the section uses information obtained from the *Davis General Plan*[3] and associated EIR.[4] This section addresses air quality impacts at the local and project level. Impacts of carbon dioxide, greenhouse gases, and climate change are addressed in Section 4.7, Greenhouse Gas Emissions and Energy, of this EIR.

4.3.2 EXISTING ENVIRONMENTAL SETTING

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

Air Basin Characteristics

The City of Davis is located in Yolo County, which is within the Sacramento Valley Air Basin (SVAB). Air quality in the SVAB is largely the result of the following factors: emissions, geography, and meteorology (wind, atmospheric stability, and sunlight). The Sacramento Valley

---

1 Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts*. July 11, 2007. Available at: http://www.ysaqmd.org/documents/CEQAHandbook2007.pdf. Accessed February 2015.

2 ENVIRON International Corporation and the California Air Districts. *California Emissions Estimator Model User's Guide Version 2013.2*. July 2013.

3 City of Davis. *Davis General Plan.* Adopted May 2001. Amended through January 2007.

4 City of Davis. *Program EIR for the City of Davis General Plan Update and Project EIR for Establishment of a New Junior High School*. January 2000.

is often described as a bowl-shaped valley, with the SVAB being bounded by the North Coast Ranges on the west, the Northern Sierra Nevada Mountains on the east, and the intervening terrain being flat. The Sacramento Valley has a Mediterranean climate, characterized by hot, dry summers and mild, rainy winters. During the year, the temperature may range from 20 to 115 degrees Fahrenheit, with summer highs usually in the 90-degree Fahrenheit range and winter lows occasionally below freezing. Average annual rainfall is approximately 20 inches, with snowfall being very rare. The winds in the area are moderate in strength and vary from moist, clean breezes from the south to dry land flows from the north.[5] According to the Western Regional Climate Center, the prevailing wind direction throughout the year in the project area is from the south.[6]

The mountains surrounding the Sacramento Valley create a barrier to airflow, which can trap air pollutants in the valley when meteorological conditions are right and a temperature inversion exists. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells lie over the valley. The lack of surface wind during such 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 the air. The surface concentrations of pollutants are highest when these conditions are combined with smoke from agricultural burning, which is regulated through YSAQMD permits, or when temperature inversions trap cool air, fog, and 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. However, during approximately half of the days from July to September, a phenomenon called the "Schultz Eddy" prevents such transport from occurring. Instead of allowing for the prevailing wind patterns to move north, carrying the pollutants out of the valley, the Schultz Eddy causes the wind pattern and pollutants to circle back southward. The Schultz Eddy effect exacerbates the pollution levels in the area and increases the likelihood of violating the federal and State air quality standards.

Ambient Air Quality Standards

The federal Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (USEPA) to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants, known as criteria pollutants, because the criteria air pollutants could be detrimental to human health and the environment. The criteria pollutants include particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead. Primary standards are the set of limits based on human health; and secondary standards are the set of limits intended to prevent environmental and property damage. States may also establish their own ambient air quality standards, provided

[5] Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts*. July 11, 2007. Available at: http://www.ysaqmd.org/documents/CEQAHandbook2007.pdf. Accessed February 2015.

[6] Western Regional Climate Center. *Prevailing Wind Direction.* Available at: http://www.wrcc.dri.edu/htmlfiles/westwinddir.html. Accessed March 2015.

the State standards are at least as stringent as the NAAQS. California has established California Ambient Air Quality Standards (CAAQS) pursuant to Health and Safety Code Section 39606(b) and its predecessor statutes. The State of California has established air quality standards for some pollutants not addressed by federal standards, including hydrogen sulfide, sulfates, vinyl chloride, and visibility-reducing particles.

The NAAQS and CAAQS summarized in Table 4.3-1 represent the maximum amount of a pollutant that can be present in outdoor air without harm to public health.[7]

Table 4.3-1
Ambient Air Quality Standards

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

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

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

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

[7] California Air Resource Board. *Ambient Air Quality Standards (AAQS)*. July 2, 2013. Available at: http://www.arb.ca.gov/research/aaqs/aaqs.htm. Accessed March 2015.

A summary of the pollutants, their characteristics, health effects, and typical sources is provided in Table 4.3-2, followed by brief descriptions of each criteria pollutant. Of the pollutants, particle pollution and ground-level ozone are the most widespread health threats.

Toxic Air Contaminants

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

The California Air Resources Board (CARB) has identified DPM from diesel-fueled engines as a TAC; thus, high volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic are identified as having the highest associated health risks from DPM. Construction-related activities also have the potential to generate concentrations of DPM from on-road haul trucks and off-road equipment exhaust emissions. Major distribution centers or other land uses that involve heavy truck traffic or idling, or substantial use of stationary diesel engines, are not located in the vicinity of the proposed project. Interstate 80 (I-80) is located south of the proposed project site. Between I-80 and the project site are Union Pacific Railroad (UPRR) tracks. The UPRR tracks are located approximately 70 feet from the southern boundary of the Mace Triangle Site. The tracks are separated from the southwestern border of the MRIC site by the Mace Triangle site and Country Road (CR) 32A and from the southeastern border of the MRIC site by CR 32A. Accordingly, the southern border of the MRIC ite is located anywhere from approximately 1,100 feet to 130 feet from the UPRR tracks. The tracks sit at a slightly higher elevation (less than five feet) than the proposed project site. The UPRR tracks are currently used for not only freight operations, but for Capitol Corridor passenger trains, which involve 30 passenger trains per day (nearly hourly service) during weekdays.[8] It should be noted that the CARB does not consider railroad tracks to represent a potentially significant source of TAC emissions due to the lack of idling trains, but considers rail yards to be a significant source of TACs due to the amount of trains and idling.

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

[8] Capitol Corridor Joint Powers Authority. *Letter: "Draft Environmental Impact Report for the Valero Crude Rail Project"*. September 15, 2014.

Table 4.3-2
Summary of Criteria Air Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
Ozone (O_3)	• A highly reactive gas consisting of three oxygen atoms • Often called photochemical smog • Produced by photochemical process involving the sun's energy • A secondary pollutant formed from a chemical reaction between ROG and NO_X emissions in the presence of sunlight • Levels are highest during summer and during the afternoon and early evening hours	• Eye irritation • Wheezing, chest pain, dry throat, headache, or nausea • Aggravated respiratory disease such as emphysema, bronchitis, and asthma	Combustion sources such as factories, automobiles, and evaporation of solvents and fuels.
Reactive Organic Gas (ROG)	• Reactive chemical gas composed of hydrocarbon compounds • Contributes to formation of smog and ozone through atmospheric chemical reactions	• Some compounds that make up ROG are toxic, such as the carcinogen benzene	Paints and solvents.
Oxides of Nitrogen (NO_X)	• Gaseous nitrogen compounds • Precursors to the formation of ozone and particulate matter • Nitrogen dioxide is major component • NO_X reacts with ROG to form smog	• Component of acid rain • Lung irritation • Lung damage • Chronic respiratory disease	Combustion of fossil fuels under high temperature and pressure, and motor vehicles.
Carbon Monoxide (CO)	• An odorless, colorless, highly toxic gas formed by the incomplete combustion of fuels • Emitted directly into the air • Primarily a winter pollution problem due to cold stagnant weather conditions	• Impairment of oxygen transport in the bloodstream • Impaired vision, reduced alertness, chest pain, and headaches • Reduction in mental and physical functions • Can be fatal in the case of very high concentrations	Automobile exhaust, combustion of fuels, and combustion of wood in woodstoves and fireplaces.
Nitrogen Dioxide (NO_2)	• A reddish-brown gas that discolors the air and is formed during combustion of fossil fuels under high temperature and pressure.	• Lung irrigation and damage • Increased risk of acute and chronic respiratory disease	Automobile and diesel truck exhaust, industrial processes, and fossil-fueled power plants.
Sulfur Dioxide	• A colorless, irritating gas • Has a rotten egg odor	• Aggravation of chronic obstruction lung disease	Combustion of sulfur-containing

(Continued on next page)

Table 4.3-2
Summary of Criteria Air Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
(SO_2)	• Particles are a component of PM_{10}	• Increased risk of acute and chronic respiratory disease	fossil fuels from mobile sources, such as locomotives, shops, and off-road diesel equipment, and industrial processes, such as petroleum refining and metal processing.
Particulate Matter (PM_{10} and $PM_{2.5}$)	• A complex mixture of extremely small particles and liquid droplets • Made up of a number of components, including acids, organic chemicals, metals and soil or dust particles • Size of particles directly linked to potential for causing health impacts • Particles 10 micrometers in diameter or smaller (PM_{10}) can pass through the throat and nose and enter the lungs • USEPA groups particle pollution into three categories based on the size of the particles and where they are deposited: o "Inhalable coarse particles ($PM_{2.5-10}$)," which are found near roadways and dusty industries, are between 2.5 and 10 micrometers in diameter. $PM_{2.5-10}$ is deposited in the thoracic region of the lungs. o "Fine particles ($PM_{2.5}$)," which are found in smoke and haze, are 2.5 micrometers in diameter and smaller. $PM_{2.5}$ particles could be directly emitted from sources such as forest fires, or could form when gases emitted from power plants, industries, and automobiles react in the air. They penetrate deeply into the thoracic and alveolar regions of the lungs. o "Ultrafine particles (UFP)," which are very, very small	• Aggravation of chronic respiratory disease • Heart and lung disease • Coughing or difficulty breathing • Bronchitis • Chronic respiratory disease in children • Irregular heartbeat • Nonfatal heart attacks • Increased blood pressure	Combustion sources such as automobiles, power generation, industrial processes, and wood burning. Also from unpaved roads, farming activities, and fugitive windblown dust.

(Continued on next page)

Table 4.3-2
Summary of Criteria Air Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
	particles (less than 0.1 micrometers in diameter) largely resulting from the combustion of fossil fuels, meat, wood, and other hydrocarbons. While UFP mass is a small portion of $PM_{2.5}$, their high surface area, deep lung penetration, and transfer into the bloodstream could result in disproportionate health impacts relative to their mass. UFP is not currently regulated separately, but is analyzed as part of $PM_{2.5}$. • PM_{10}, $PM_{2.5-10}$, and UFP include primary pollutants (emitted directly to the atmosphere) as well as secondary pollutants (formed in the atmosphere by chemical reactions among precursors)		
Lead	• A soft and chemically resistant metal • A natural constituent of air, water, and the biosphere • Is not created nor destroyed in the environment • As an air pollutant, lead is present in small particles • Present in many soils and could become re-suspended into the air	• Impaired blood formation and nerve conduction • Fatigue, anxiety, short-term memory loss, depression, loss of appetite, weakness, apathy, and miscarriage • Lesions of the neuromuscular system, circulatory system, brain, and gastrointestinal tract • Learning disabilities in children • Cancer	Industrial sources combustion of leaded gasoline, and contaminated soils.
Sulfates (SO_4^{2-})	• The fully oxidized ionic form of sulfur • Colorless gas • Occur in combination with metal and/or hydrogen ions • Sulfur compounds occur from combustion of petroleum fuels containing sulfur, where the sulfur is oxidized to SO_2 during the combustion process and converted to sulfate compounds in the atmosphere	• Aggravation of respiratory symptoms • Decrease in ventilatory function • Aggravation of asthmatic symptoms • Increased risk of cardio-	Combustion of petroleum-derived fuels that contain sulfur.

(Continued on next page)

Table 4.3-2
Summary of Criteria Air Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
	• Conversion of SO_2 to sulfates occurs rapidly and completely in urban areas	pulmonary disease	
Hydrogen Sulfide (H_2S)	• A colorless, flammable gas with a rotten egg odor • Extremely hazardous in high concentrations, especially in enclosed spaces • Occurs naturally in crude petroleum, natural gas, and hot springs • Produced by bacterial breakdown of organic materials and human and animal wastes	• Irritation of the eyes, nose, throat, and respiratory system • Aggravation of asthmatic symptoms • Headaches, fatigue, irritability, insomnia, digestive disturbances, and weight loss • Nausea, vomiting, staggering, and excitability • High concentrations can cause shock, convulsions, inability to breathe, extremely rapid unconsciousness, coma, and death	Geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations.
Vinyl Chloride (C_2H_3Cl, or VCM)	• A colorless gas that does not occur naturally, but is formed when other substances such as trichloroethane, trichloroethylene, and tetrachloro-ethylene are broken down • Used to make polyvinyl chloride (PVC), which is used to make a variety of plastic products, including pipes, wire and cable coatings, and packaging materials	• Central nervous system effects, such as dizziness, drowsiness, and headaches • Liver damage • Cancer	Exhaust gases from factories that manufacture or process vinyl chloride, or evaporation from chemical waste storage areas.

Sources:

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

Naturally occurring asbestos (NOA) was identified as a TAC in 1986 by CARB. Earth disturbance activity could result in the release of NOA to the air. NOA is located in many parts of California and is commonly associated with ultramafic rocks. According to mapping prepared by the California Geological Survey, Yolo County is not in an area likely to contain NOA.[9] Thus, sensitive receptors would not be exposed to NOA as a result of the proposed project.

Attainment Status and Regional Air Quality Plans

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

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

Table 4.3-3 presents the current attainment status of the jurisdictional area of the YSAQMD. As shown in the table, Yolo County is in attainment for all State and federal AAQS, with the exception of ozone, PM_{10}, and $PM_{2.5}$. At the federal level, the area is designated as severe nonattainment for the 8-hour ozone standard, nonattainment for the 24-hour $PM_{2.5}$ standard, and attainment or unclassified for all other criteria pollutants. At the State level, the area is designated as a serious nonattainment area for the 1-hour ozone standard, nonattainment for the 8-hour ozone standard, nonattainment for the PM_{10} and $PM_{2.5}$ standards, and attainment or unclassified for all other State standards. Although the 1-Hour federal ozone standard has been revoked, on October 18, 2012, the USEPA officially determined that the Sacramento Federal Nonattainment Area (SFNA), which includes Sacramento and Yolo counties, Placer and El Dorado counties (except Lake Tahoe Basin portions), Solano County (eastern portion), and

[9] California Department of Conservation, Division of Mines and Geology. *A General Location Guide For Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos*. August 2000.

Sutter County (southern portion), attained the revoked 1-hour ozone NAAQS. The determination became effective November 19, 2012.[10]

Table 4.3-3
Attainment Status

Pollutant	Designation/Classification	
	Federal Standards	**State Standards**
Ozone – 1-Hour	Revoked in 2005	**Serious Nonattainment**
Ozone – 8-Hour	**Severe Nonattainment**	**Nonattainment**
Carbon Monoxide	Attainment	Attainment
Nitrogen Dioxide	Unclassified/Attainment	Attainment
Sulfur Dioxide	Attainment (Pending)	Attainment
PM_{10}	Attainment	**Nonattainment**
$PM_{2.5}$ – 24-Hour	**Nonattainment**	No State Standard
$PM_{2.5}$ – Annual	Unclassified/Attainment	**Nonattainment**
Lead	Unclassified/Attainment	Attainment
Sulfates	No Federal Standard	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Visibility Reducing Particles	No Federal Standard	Unclassified

Sources:

- *YSAQMD. Meeting Health Standards. Available at: http://www.ysaqmd.org/planning/status.php. Accessed February 2015.*
- *Sacramento Metropolitan Air Quality Management District. Air Quality Standards Attainment Status. Available at: http://www.airquality.org/aqdata/attainmentstat.shtml (last updated on December 23, 2013). Accessed December 2014.*

Due to the nonattainment designations, the YSAQMD, along with the other air districts in the SVAB region, is required to develop plans to attain the federal and State standards for ozone and particulate matter. The air quality plans include emissions inventories to measure the sources of air pollutants, to evaluate how well different control measures have worked, and show how air pollution would be reduced. In addition, the plans include the estimated future levels of pollution to ensure that the area would meet air quality goals. Each of the attainment plans currently in effect are discussed in further detail in the Regulatory Context section of this section.

Local Air Quality Monitoring

Air quality is monitored by CARB at various locations to determine which air quality standards are being violated, and to direct emission reduction efforts, such as developing attainment plans and rules, incentive programs, etc. The nearest monitoring station to the City of Davis and the proposed project site would be the Davis-UCD Campus station, located along Campbell Road between Hutchison Drive and Garrod Drive in Davis, approximately 4.5 miles southwest of the project site. The Davis-UCD Campus station does not have data available for PM_{10}; thus, the nearest station with such data was used, which was the Woodland-Gibson Road station located at

[10] U.S. Environmental Protection Agency. *Air Actions in the Sacramento Metro Area.* October 3, 2012. Available at: http://www.epa.gov/region9/air/actions/sacto/index.html. Accessed October 2014.

41929 Gibson Road in Woodland, approximately nine miles northwest of the project site. Table 4.3-4 presents the number of days that each criteria air pollutant standard was exceeded and/or the annual average mean concentrations for the years 2011 through 2013 for those pollutants for which monitoring data is available from the Davis-UCD Campus and Woodland-Gibson Road monitoring stations.

Table 4.3-4
Air Quality Monitoring Data Summary for Project Area

Pollutant	Standard	Days Standard Exceeded During:		
		2011	2012	2013
Ozone	1-Hour State	0	0	0
	8-Hour State	2	4	0
	8-Hour Federal	1	1	0
PM_{10}[1]	24 Hour State	1	1	4
	Annual Mean State	19.1	18.1	22.9
	24 Hour Federal	0	0	0
$PM_{2.5}$	Annual Mean State	12.6	9.0	*
	Annual Mean Federal[1]	*	6.4	7.4
	24 Hour Federal[1]	1	0	0
Nitrogen Dioxide	Annual Mean State	7	7	6
	1-Hour State	0	0	0
	1-Hour Federal	0	0	0

[1] Obtained from the Woodland-Gibson Road monitoring station.
* Data not available.

Source: California Air Resources Board. Aerometric Data Analysis and Management (ADAM): Top Four Summary. Available at: http://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed March 2015.

Existing On-Site Emissions

The proposed project site consists of the MRIC Site, which makes up the majority of the project site, and the Mace Triangle Site, which is located in the southwestern portion of the project site. The MRIC Site is currently used for agricultural purposes. The recent tomato farming operations consist of the following: spray operations in the beginning of the year; opening of tomato beds, incorporation of herbicides, and transplanting of tomato plants in March; starting diesel pump for drip irrigation and spaying for aphids and worms in April; hoeing of weeds in May; high cropping the tomato beds in June; training tomato vines, high cropping tomato beds, discing the headlands in July; and harvesting, working ground, and shaping tomato beds in August. The current operations on the MRIC Site involve the generation of vehicle trips, use of tractors and other heavy-duty, off-road diesel equipment, water trucks, and a deep-well diesel pump for irrigation water. The Mace Triangle Site currently consists of an existing water storage tank, Park-and-Ride lot, Ikedas Market, agriculture, and vacant land.

Odors

While offensive odors rarely cause physical harm, they can be unpleasant, leading to considerable annoyance and distress among the public and can generate citizen complaints to

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

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

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

Odiferous compounds can be generated from a variety of source types including both construction and operational activities. A project's operations, depending on the project type, can generate a large range of odiferous compounds that can be considered offensive to receptors. Examples of common land use types that typically generate significant odor impacts include, but are not limited to wastewater treatment plants; sanitary landfills; composting/green waste facilities; recycling facilities; petroleum refineries; chemical manufacturing plants; painting/coating operations; rendering plants; and food packaging plants. The project site is not located in the vicinity of any such existing uses.

Although less common, diesel fumes associated with diesel-fueled equipment and heavy-duty trucks, such as from construction activities, are often found to be objectionable. As such, nearby sensitive receptors could be subjected to diesel fumes associated with construction of the project. It should be noted that existing ongoing agricultural uses are located adjacent to the MRIC Site to the north, northeast, and east, including the Mace 391 and Howatt permanent agricultural easements. The existing nearby agricultural operations involve the use of diesel-fueled equipment, which could be associated with objectionable odors, and the generation of fugitive dust emissions.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others, due to the types of population groups or activities involved. Heightened sensitivity may be caused by health problems, proximity to the emissions source, and/or duration of exposure to air pollutants. Children, pregnant women, the elderly, and those with existing health problems are especially vulnerable to the effects of air pollution. Accordingly, land uses that are typically considered to

be sensitive receptors include residences, schools, childcare centers, playgrounds, retirement homes, convalescent homes, hospitals, and medical clinics. The existing nearby multi-family residences, located approximately 660 feet to the west of the site, would be considered the nearest sensitive receptors to the site. The nearest existing school, which would be considered a sensitive receptor, to the project site is the Frances Harper Junior High School, which is located over 1,550 feet from the western of the border of the project site.

4.3.3 REGULATORY CONTEXT

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

Federal Regulations

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

CAA and USEPA

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

State Regulations

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

CCAA and CARB

The CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the CCAA. The CCAA requires that air quality plans be prepared for areas of the State that have not met the CAAQS for ozone, CO, NO_X, and SO_2. Among other requirements of the CCAA, the plans must include a wide

range of implementable control measures, which often include transportation control measures and performance standards. In order to implement the transportation-related provisions of the CCAA, local air pollution control districts have been granted explicit authority to adopt and implement transportation controls. The CARB, California's air quality management agency, regulates and oversees the activities of county air pollution control districts and regional air quality management districts. The CARB regulates local air quality indirectly using State standards and vehicle emission standards, by conducting research activities, and through planning and coordinating activities. In addition, the CARB has primary responsibility in California to develop and implement air pollution control plans designed to achieve and maintain the NAAQS established by the USEPA. Furthermore, the CARB is charged with developing rules and regulations to cap and reduce GHG emissions.

Air Quality and Land Use Handbook

CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (Handbook) addresses the importance of considering health risk issues when siting sensitive land uses, including residential development, in the vicinity of intensive air pollutant emission sources including freeways or high-traffic roads, distribution centers, ports, petroleum refineries, chrome plating operations, dry cleaners, and gasoline dispensing facilities.[11] The CARB Handbook draws upon studies evaluating the health effects of traffic traveling on major interstate highways in metropolitan California centers within Los Angeles (Interstate [I] 405 and I-710), the San Francisco Bay, and San Diego areas. The recommendations identified by CARB, including siting residential uses a minimum distance of 500 feet from freeways or other high-traffic roadways, are consistent with those adopted by the State of California for location of new schools. Specifically, the CARB Handbook recommends, "Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day" (CARB 2005).

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

[11] California Air Resources Board. *Air Quality and Land Use Handbook: A Community Health Perspective*. April 2005.

AB 1807

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

AB 2588

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

Executive Order S-01-07

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

In-Use Off-Road Diesel Vehicle Regulation

On July 26, 2007, CARB adopted a regulation to reduce DPM and NO_X emissions from in-use (existing), off-road, heavy-duty diesel vehicles in California.[12] Such vehicles are used in construction, mining, and industrial operations. The regulation is designed to reduce harmful emissions from vehicles by subjecting fleet owners to retrofit or accelerated replacement/repower requirements, imposing idling limitations on owners, operators, renters, or lessees of off-road diesel vehicles. The idling limits require operators of applicable off-road vehicles (self-propelled diesel-fueled vehicles 25 horsepower and up that were not designed to be driven on-road) to limit idling to less than five minutes. The idling requirements are specified in Title 13 of the California Code of Regulations.

Senate Bill 656

In 2003, the Legislature passed Senate Bill (SB) 656 to reduce public exposure to PM_{10} and $PM_{2.5}$ above the State CAAQS. The legislation requires the CARB, in consultation with local air pollution control and air quality management districts, to adopt a list of the most readily available, feasible, and cost-effective control measures that could be implemented by air districts to reduce PM_{10} and $PM_{2.5}$ emissions. The CARB list is based on California rules and regulations existing as of January 1, 2004, and was adopted by CARB in November 2004. Categories

[12] California Air Resources Board. *In-Use Off-Road Diesel Vehicle Regulation*. December 10, 2014. Available at: http://www.arb.ca.gov/msprog/ordiesel/ordiesel.htm. Accessed March 2015.

addressed by SB 656 include measures for reduction of emissions associated with residential wood combustion and outdoor greenwaste burning, fugitive dust sources such as paved and unpaved roads and construction, combustion sources such as boilers, heaters, and charbroiling, solvents and coatings, and product manufacturing. Some of the measures include, but are not limited to, the following:

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

Under SB 656, each air district is required to prioritize the measures identified by CARB, based on the cost effectiveness of the measures and their effect on public health, air quality, and emission reductions. On July 13, 2005, the YSAQMD adopted an implementation schedule for SB 656.

Local Regulations

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

YSAQMD

Various local, regional, State and federal agencies share the responsibility for air quality management in Yolo County. The YSAQMD operates at the local level with primary responsibility for attaining and maintaining the federal and State AAQS in Yolo County. The YSAQMD is tasked with implementing programs and regulations required by the FCAA and the CCAA, including preparing plans to attain federal and State AAQS. The YSAQMD works jointly with the USEPA, CARB, Sacramento Area Council of Governments (SACOG), other air districts in the region, county and city transportation and planning departments, and various non-governmental organizations to improve air quality through a variety of programs. Programs include the adoption of regulations, policies and guidance, extensive education and public outreach programs, as well as emission reducing incentive programs.

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 *Handbook for Assessing*

and Mitigating Air Quality Impacts.[13] 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 Standards of Significance section below.

YSAQMD Rules and Regulations

All projects under the jurisdiction of the YSAQMD are required to comply with all applicable YSAQMD rules and regulations. In addition, YSAQMD permit requirements apply to most industrial processes (e.g., manufacturing facilities, food processing), many commercial activities (e.g., print shops, drycleaners, gasoline stations), and other miscellaneous activities (e.g., demolition of buildings containing asbestos and aeration of contaminated soils). The YSAQMD regulations and rules include, but are not limited to, the following:

Regulation II – Prohibition, Exceptions - Requirements

Regulation II is comprised of prohibitory rules that are written to achieve emission reductions from specific source categories. The rules are applicable to existing sources as well as new sources. Examples of prohibitory rules include Rule 2.1 (Control of Emissions), Rule 2.28 (Cutback and Emulsified Asphalts), Rule 2.5 (Nuisance), Rule 2.11 (Particulate Matter Concentration), Rule 2.14 (Architectural Coatings), and Rule 2.40 (Wood Burning Appliances).

Regulations III – Permit System

Regulation III is intended to provide an orderly procedure for the review of new sources, and modification and operation of existing sources, of air pollution through the issuance of permits. Regulation III primarily deals with permitting major emission sources and includes, but is not limited to, rules such as General Permit Requirements (Rule 3.1), Exemptions (Rule 3.2), Portable Equipment (Rule 3.3), New Source Review (Rule 3.4), Emission Reduction Credits (Rule 3.5), Emission Statements (Rule 3.7), and Toxics New Source Review (Rule 3.13).

Air Quality Attainment Plans

Each of the attainment plans currently in effect for the SVAB are discussed in further detail below.

[13] Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts*. July 11, 2007. Available at: http://www.ysaqmd.org/documents/CEQAHandbook2007.pdf. Accessed February 2015.

2013 Revisions to the Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan[14]

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.

$PM_{2.5}$ Implementation/Maintenance Plan and Re-designation Request for Sacramento $PM_{2.5}$ Nonattainment Area[15]

The Sacramento federal $PM_{2.5}$ Nonattainment Area attained the federal $PM_{2.5}$ health standards on December 31, 2011. The *$PM_{2.5}$ Implementation/Maintenance Plan and Re-designation Request for Sacramento $PM_{2.5}$ Nonattainment Area* ($PM_{2.5}$ Implementation/Maintenance Plan) was prepared to show that the region has met the requirements and requests that the USEPA re-designate the area to attainment. The USEPA issued a final rule for Determination of Attainment for the Sacramento Nonattainment Area effective August 14, 2013. The $PM_{2.5}$ Implementation/Maintenance Plan would be adopted by the air districts within the nonattainment area, as well as the CARB, as a revision to the SIP. Contents of the $PM_{2.5}$ Implementation/Maintenance Plan include demonstration that the NAAQS was met and that all requirements have been met for a re-designation to attainment, specification of actions to be taken if the standards are violated in the future, and establishment of regional motor vehicle emission budgets.

Because the proposed project is located within the nonattainment area for $PM_{2.5}$, the project would be subject to the requirements set forth in the $PM_{2.5}$ Implementation/Maintenance Plan, as enforced by YSAQMD through rules and regulations.

2012 Triennial Assessment and Plan Update[16]

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

[14] Sacramento Metropolitan Air Quality Management District. *2013 Revisions to the Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan.* September 26, 2013.

[15] Sacramento Metropolitan Air Quality Management District. *$PM_{2.5}$ Implementation/Maintenance Plan and Re-designation Request for Sacramento $PM_{2.5}$ Nonattainment Area*. October 24, 2013.

[16] Yolo-Solano Air Quality Management District. *Triennial Assessment and Plan Update*. April 2013. Available at: http://www.ysaqmd.org/documents/plans/Triennial%20Plan%202012%20DRAFT.pdf. Accessed February 2015.

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.[17] The YSAQMD adopted the 2012 Triennial Assessment and Plan Update on April 10, 2013, which assesses air quality data from 2009 through 2011 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 2012 Triennial Assessment and Plan Update or YSAQMD efforts related to PM emissions, as enforced by YSAQMD through rules and regulations.

Davis General Plan

The *Davis General Plan* includes one specific policy related to air quality. This policy is discussed in Impact 4.3-5 below.

4.3.4 IMPACTS AND MITIGATION MEASURES

The standards of significance and methodology used to analyze and determine the proposed project's potential project-specific impacts are described below. In addition, a discussion of the project's impacts, as well as mitigation measures where necessary, is also presented.

Standards of Significance

Table 4.3-5 below presents the YSAQMD's recommended thresholds of significance, which are expressed in tons per year (tons/yr) for ROG and NO_X and pounds per day (lbs/day) for PM_{10}. In addition, the YSAQMD utilizes a screening approach to estimate whether a project's traffic impact would cause a potential CO hotspot at any given intersection.

[17] Yolo-Solano Air Quality Management District. *State Standards and Planning*. Available at: http://www.ysaqmd.org/planning/state.php. Accessed February 2015.

Table 4.3-5 YSAQMD Thresholds of Significance		
Pollutant	**Construction Thresholds**	**Operational Thresholds**
ROG	10 tons/yr	10 tons/yr
NO_X	10 tons/yr	10 tons/yr
PM_{10}	80 lbs/day	80 lbs/day
Source: YSAQMD. Handbook for Assessing and Mitigating Air Quality Impacts. July 11, 2007.		

Based on the recommendations of YSAQMD as presented above, consistent with Appendix G of the CEQA Guidelines, the City's General Plan, and professional judgment, a significant impact would occur if the proposed project would result in any of the following:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate 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; or
- Conflict, or create an inconsistency, with any applicable plan, policy, or regulation adopted for the purpose of avoiding or mitigating environmental effects related to air quality.

The project's cumulatively considerable net increase in criteria pollutants (i.e., the third bullet point in the list above) is addressed in Chapter 5, Cumulative Impacts, of this EIR.

Method of Analysis

The analysis protocol and guidance provided by the YSAQMD's *Handbook for Assessing and Mitigating Air Quality Impacts* was used to analyze the proposed project's air quality impacts, including screening criteria and pollutant thresholds of significance.

Construction Emissions

The proposed project's short-term construction emissions were estimated using the California Emissions Estimator Model (CalEEMod) version 2013.2.2 software - a statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify air quality emissions from land use projects. The model applies inherent default values for various land uses, including trip generation rates based on the ITE Manual, vehicle mix, trip length, average speed, etc. However, where project-specific data was available, such data was input into the model.

Although the proposed project is expected to be built out over four separate phases (see Figure 3-19 of the Project Description chapter of this EIR), specific uses to be built out per phase is

speculative at this time and would ultimately be based on demand. Accordingly, project-specific details regarding the buildout schedule for the proposed project are currently unavailable. Thus, the following assumptions were made for the project construction modeling:

- Demolition would not be required;
- Construction was assumed to commence in July 2017;
- Construction was assumed to occur over one phase in order to provide a conservative estimate;
- In order to be consistent with the buildout assumptions utilized by the traffic consultant, the project was assumed to be fully operational by 2035 (i.e., construction was assumed to occur over an 18-year period);
- Construction phase durations (i.e., site preparation, grading, building construction, and architectural coating phases) were modified to reflect an 18-year construction period; and
- A total of 224.42 acres would be disturbed during the grading phase.

The results of emissions estimations were compared to the standards of significance discussed above in order to determine the associated level of impact. All CalEEMod modeling results are included in Appendix C to this EIR.

Construction-Related DPM Emissions

The proposed project's construction-related PM_{10} concentrations at the nearest sensitive receptors were estimated using the American Meteorological Society/Environmental Protection Agency (EPA) Regulatory Model (AERMOD) dispersion model. As the YSAQMD does not have specific guidelines for dispersion modeling for construction-related PM_{10} emissions, the modeling for the proposed project was performed in accordance with SMAQMD's *Dispersion Modeling of Construction-Generated PM_{10} Emissions*.[18] Per the SMAQMD's *Dispersion Modeling of Construction-Generated PM_{10} Emissions*, two sets of multiple volume sources (one set representing ground-level sources to characterize fugitive PM_{10} dust emissions and one set of elevated sources to represent PM_{10} exhaust emissions generated by construction equipment) were modeled with the input parameters consistent with the recommendations per SMAQMD. The resultant maximum concentration that would occur at the nearest sensitive receptors was compared to the CAAQS for PM_{10}, which, as stated previously, is the maximum amount of a pollutant that can be present in outdoor air without harm to public health. In addition, the SMAQMD considers the CAAQS the concentration-based threshold of significance for construction-related PM_{10} emissions. The AERMOD modeling results are included in Appendix C to this EIR.

[18] Sacramento Metropolitan Air Quality Management District. *Dispersion Modeling of Construction-Generated PM_{10} Emissions*. July 2013. Available at: http://www.airquality.org/ceqa/cequguideupdate/Ch3PMDispersionModelingGuidanceFINAL.pdf. Accessed October 2014.

Operational Emissions

The proposed project's operational emissions were estimated using CalEEMod. In order to be consistent with the buildout assumptions utilized by the traffic consultant, the project was assumed to be fully operational by 2035. The modeling performed for the proposed project included compliance with YSAQMD rules and regulations (i.e., low-VOC [volatile organic compounds] paints and low-VOC cleaning supplies), as well as with the California Building Energy Efficiency Standards Code and Tier 1 of the CALGreen Code per City standards to the extent feasible at this time. The proposed project's compliance with the California Building Energy Efficiency Standards Code and CALGreen Code would be verified as part of the City's building approval review process. The proposed project's inclusion of on-site renewable energy sufficient to supply a minimum of 50 percent of the energy requirements of the project has been applied to CalEEMod as an inherent project feature.

The project-specific VMT data provided by Fehr & Peers, Inc. for full buildout of the proposed project was also applied to the project modeling.[19] According to Section 4.14, Transportation and Circulation, of this EIR, forecasts of VMT were estimated using the four-step SACMET travel model that encompasses the six-county SACOG region. The SACMET model was used, as the model more fully accounts for the length of trips originating in Davis given the larger geographic coverage. The VMT forecasts were developed by incorporating into the SACMET model the land use forecasts and employment reallocation assumptions as discussed in further detail in Section 4.14 of this EIR.

The results of emissions estimations were compared to the standards of significance discussed above in order to determine the associated level of impact. All CalEEMod modeling results are included in Appendix C to this EIR.

Localized CO Emissions

Concentrations of CO were estimated utilizing the California Department of Transportation (Caltrans) CALINE4 version 2.1 modeling software for intersections that could cause a potential CO hotspot per YSAQMD screening criteria. The CALINE4 model is a dispersion model for predicting air pollutant concentrations near roadways.[20] The YSAQMD's preliminary screening methodology for localized CO emissions provides a conservative indication of whether project-generated vehicle trips would result in the generation of CO emissions that would contribute to an exceedance of AAQS. Per the YSAQMD screening methodology, if either of the following occurs associated with any intersection affected by a project, then that project has the potential to result in localized CO emissions that could violation CO standards:

[19] Fehr & Peers. Personal communication with Bob Grandy, Principal. February 6, 2015.
[20] California Department of Transportation. *User's Guide for CL4: A User-Friendly Interface for the CALINE4 Model for Transportation Project Impact Assessments*. June 1998.

- A traffic study for the project indicates that the peak-hour Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity will be reduced to an unacceptable LOS (typically LOS E or F); or
- A traffic study indicates that the project will substantially worsen an already existing peak-hour LOS F on one or more streets or at one or more intersections in the project vicinity. "Substantially worsen" includes situations where delay would increase by 10 seconds or more when project-generated traffic is included.

The analysis within Section 4.14, Transportation and Circulation, of this EIR was used in comparison to the screening criteria above in order to determine which intersections would be degraded by the proposed project and could generation of CO emissions that would contribute to an exceedance of AAQS. It should be noted that only the worst-case intersection and roadway segment (i.e., the intersection and roadway with the worst LOS, highest delay, and highest traffic volumes) were modeled, as all other intersections and roadways would experience less traffic volumes and less delay. Thus, all other intersections that would be potentially affected by the proposed project would not be expected to experience CO concentrations in excess of the highest predicted CO concentrations associated with the worst-case intersection and roadway analyzed. In addition, a highly conservative assumption that the nearest sensitive receptor to the worst-case intersection and roadway would be approximately 32 feet (10 meters) from the center of the intersection/roadway was applied to the modeling. Such a distance provides a conservative estimate, as a sensitive receptor would not be located within such close proximity to any of the potentially affected intersections or roadways. The results of the model were compared to the threshold established by the YSAQMD, which refers to the CAAQS for CO.

Project-Specific Impacts and Mitigation Measures

The following discussion of air quality impacts is based on implementation of the proposed project in comparison to existing conditions and the standards of significance presented above. The discussions and mitigation measures presented below apply to both the MRIC and the Mace Triangle unless otherwise stated.

4.3-1 Violate any air quality standard or contribute substantially to an existing or projected air quality violation during construction. Based on the analysis below, the impact is *less than significant.*

During construction of the proposed project, various types of equipment and vehicles would temporarily operate on the project site. Construction exhaust emissions would be generated from construction equipment, vegetation clearing and earth movement activities, construction workers' commute, and construction material hauling for the entire construction period. The aforementioned activities would involve the use of diesel- and gasoline-powered equipment that would generate emissions of criteria pollutants. Project construction activities also represent sources of fugitive dust, which includes PM_{10} emissions.

The construction modeling assumptions are described in the Method of Analysis section above. The proposed project's estimated construction-related emissions are presented in

Table 4.3-6. As shown in the table, the proposed project's maximum unmitigated construction-related emissions would be below the applicable thresholds of significance. Therefore, the proposed project's construction-related emissions would not result in a contribution to the region's nonattainment status of ozone or PM, and would not violate an air quality standard or contribute substantially to an existing or projected air quality violation.

Table 4.3-6
Maximum Unmitigated Project Construction-Related Emissions

Pollutant	Project Emissions	YSAQMD Threshold of Significance
ROG	2.41 tons/yr	10 tons/yr
NO_X	7.64 tons/yr	10 tons/yr
PM_{10}	21.05 lbs/day	80 lbs/day
Source: CalEEMod, July 2015 (see Appendix C).		

Compliance with Existing Law

The proposed project is required to comply with all YSAQMD rules and regulations for construction, including Rule 2.1 (Control of Emissions), Rule 2.28 (Cutback and Emulsified Asphalts), Rule 2.5 (Nuisance), Rule 2.14 (Architectural Coatings), and Rule 2.11 (Particulate Matter Concentration). In addition, all projects are required to implement best management practices to reduce dust emissions and avoid localized health impacts. The YSAQMD's best management practices for dust could include, but would not be limited to, the following:

- Watering of all active construction sites at least twice daily;
- Maintenance of at least two feet of freeboard in haul trucks;
- Covering of all trucks hauling dirt, sand, or loose materials;
- Application of non-toxic binders to exposed areas after cut and fill operations and hydroseeding of area, as applicable and/or necessary;
- Application of chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days), as applicable and/or necessary;
- Planting of tree windbreaks on the windward perimeter of construction projects if adjacent to open land;
- Planting of vegetative ground cover in disturbed areas as soon as possible;
- Covering of inactive storage piles;
- Sweeping of streets if visible soil material is carried out from the construction site;
- Treatment of accesses to distance of 100 feet from the paved road with a six- to 12-inch layer of wood chips or mulch; and
- Treatment of accesses to a distance of 100 feet from the paved road with a six-inch layer of gravel.

Compliance with the aforementioned rules and regulations related to construction, as well as the best management practices for dust would help to minimize emissions generated during construction activities.

Conclusion

Because the proposed project would result in construction-related emissions below the applicable thresholds of significance and would comply with applicable YSAQMD rules, regulations, and best management practices for dust, construction activities associated with development of the proposed project would result in a ***less-than-significant*** impact to air quality.

Mitigation Measure(s)
None required.

4.3-2 Violate any air quality standard or contribute substantially to an existing or projected air quality violation during operations, and a conflict with or obstruction of implementation of applicable air quality plans. Based on the analysis below, even with mitigation, the impact is *significant and unavoidable*.

As discussed above, due to the nonattainment designations of the area, YSAQMD has developed plans to attain the State and federal standards for ozone and particulate matter. The plans include the 2013 Ozone Attainment Plan, the $PM_{2.5}$ Implementation/Maintenance Plan, and the 2012 Triennial Assessment and Plan Update. Adopted YSAQMD rules and regulations, as well as the thresholds of significance, have been developed with the intent to ensure continued attainment of AAQS, or to work towards attainment of AAQS for which the area is currently designated nonattainment, consistent with applicable air quality plans. Thus, by exceeding the YSAQMD's mass emission thresholds for operational emissions of ROG, NO_X, or PM_{10}, a project would be considered to conflict with or obstruct implementation of the YSAQMD's air quality planning efforts.

Operational emissions of criteria pollutants would be generated by the proposed project from both mobile and stationary sources. Day-to-day activities, such as future employee vehicle trips to and from the project site, would make up the majority of the mobile emissions. Emissions would also occur from consumer products such as architectural coatings, landscape maintenance equipment exhaust, and consumer products (e.g., deodorants, detergents, hair spray, cleaning products, spray paint, insecticides, floor finishes, polishes, etc.).

The proposed project's unmitigated operational emissions have been estimated using CalEEMod. The resultant emissions estimated for operation of the proposed project are presented in Table 4.3-7. As discussed in the Method of Analysis section above, the project-specific VMT data provided by Fehr & Peers, Inc. was applied to CalEEMod, as well as the project's required compliance with the California Green Building and

Building Energy Efficiency Standards Codes, and provision of on-site renewable energy sufficient to supply a minimum of 50 percent of the project's energy demand. .

Table 4.3-7
Unmitigated Project Operational Emissions

Pollutant	Project Emissions	YSAQMD Thresholds of Significance
ROG	19.51 tons/yr	10 tons/yr
NO_X	18.83 tons/yr	10 tons/yr
PM_{10}	138.95 lbs/day	80 lbs/day
Source: CalEEMod, July 2015 (see Appendix C).		

As shown in the table, the proposed project's operational emissions of ROG, NO_X, and PM_{10} would exceed the applicable YSAQMD thresholds of significance. Accordingly, the proposed project would result in a contribution to the region's nonattainment status of ozone and PM, and could violate an air quality standard or contribute substantially to an existing or projected air quality violation.

Compliance with Existing Law

The proposed project is required to comply with all applicable YSAQMD rules and regulations, such as Rule 2.1 (Control of Emissions), Rule 2.5 (Nuisance), Rule 2.11 (Particulate Matter Concentration), Rule 2.14 (Architectural Coatings), Rule 2.37 (Natural Gas-Fired Water Heaters and Small Boilers), Rule 2.40 (Wood Burning Appliances), Rule 3.4 (New Source Review), and Rule 3.7 (Emission Statements) , and any other YSAQMD rule or regulation related to operations determined to be applicable to the project by YSAQMD staff. Compliance with the aforementioned YSAMQD rules and regulations would help to minimize emissions generated during project operations.

Conclusion

By exceeding the YSAQMD's mass emission threshold for operational emissions of ROG, NO_X, and PM_{10}, the proposed project could conflict with and/or obstruct implementation of the YSAQMD's air quality planning efforts. Overall, even with mitigation, operation of the proposed project would be considered to result in a ***significant and unavoidable*** impact to air quality.

Mitigation Measure(s)

Implementation of Mitigation Measure 4.3-2 would reduce the proposed project's operational emissions. In addition, implementation of Mitigation Measure 4.14-6 as set forth in the Transportation and Circulation section of this EIR, which requires a reduction of vehicle trips by 10 percent, would further reduce the proposed project's operational emissions. The proposed project's operational emissions with implementation of Mitigation Measures 4.3-2 and 4.14-6 are shown in Table 4.3-8.

Table 4.3-8 Mitigated Project Operational Emissions		
Pollutant	**Project Emissions**	**YSAQMD Thresholds of Significance**
ROG	17.32 tons/yr	10
NO_X	17.56 tons/yr	10
PM_{10}	124.98 lbs/day	80
Source: CalEEMod, July 2015 (see Appendix C).		

As shown in the table, the proposed project's operational ROG, NO_X, and PM_{10}emissions would not be reduced to below the applicable threshold of significance.

The majority of mitigated operational ROG emissions are associated with area sources (10.0581 tons/yr), the majority of which are from consumer products (10.0559 tons/yr). Even if the project's operational ROG emissions associated with mobile and energy sources were to be reduced to zero tons/yr, the proposed project would still result in emissions from area sources (consumer products) in excess of the applicable YSAQMD threshold of significance.

Possible additional mitigation measures for further reducing consumer product emissions of ROG could include limitations on consumer products at the site (e.g., amounts, types, etc.); however, such mitigation cannot be feasibly enforced or verified. The sale, manufacturing, substance control, and content limitation (such as VOC limits) of consumer products are regulated by federal, State, and/or local government agencies. The YSAQMD is charged with local enforcement of regulations regarding consumer products that are associated with effects on air quality. The YSAQMD is also charged with developing measures to offset potential effects on regional air quality through their planning efforts. For example, the regional 2013 Ozone Attainment Plan includes existing and new control strategies intended to provide the necessary future emission reductions to meet the ozone NAAQS. In addition, the YSAQMD's 2012 Triennial Assessment and Plan Update includes control measures intended to ensure that the CAAQS for ozone is reached. Because the proposed project has not been anticipated per the City's General Plan, the associated emissions have not been anticipated in the air quality plans. As such, any future updates to the air quality plans would have to take into account the emission associated with buildout of the proposed project (if approved) and include additional strategies to offset the overall regional emissions of ozone, including ROG emissions, through local and/or regional programs.

The majority of the proposed project's mitigated operational NO_X and PM_{10} emissions are associated with mobile sources (15.65 tons/yr and 124.18 lbs/day, respectively). The proposed project's inherent site and/or design features that would contribute to a reduction in vehicle trips and VMT, such as site enhancements and features that encourage alternative modes of transportation, which subsequently result in mobile source emissions of criteria pollutants including NO_X and PM_{10}, have already been accounted for in the project-specific VMT applied in the modeling. Additional measures for the reduction of mobile source emissions, sufficient to reduce emissions of NO_X and

PM_{10} to below the applicable thresholds of significance, are not available, nor feasible for the proposed project at this time.

Because additional feasible mitigation for the reduction of the proposed project's operational ROG, NO_X, and PM_{10} emissions is not currently available, even with implementation of the following mitigation measure, the above impact would remain *significant and unavoidable.*

MRIC and Mace Triangle

4.3-2 *Prior to issuance of any building permits, the project applicant shall show on project plans via notation that only zero-VOC paints, finishes, adhesives, and cleaning supplies shall be used for all buildings on the project site. Project plans shall be subject to review and approval by the Department of Community Development and Sustainability.*

4.3-3 Expose sensitive receptors to substantial pollutant concentrations. Based on the analysis below, the impact is *less than significant.*

As discussed above, land uses that are typically considered to be sensitive receptors include residences, schools, childcare centers, playgrounds, retirement homes, convalescent homes, hospitals, and medical clinics due to the expected presence of individuals that are especially vulnerable to the effects of air pollution (i.e., children, pregnant women, the elderly, and those with existing health problems). The primary uses proposed for the project would not involve any of the aforementioned uses or any uses that would attract children, the elderly, or those with existing health problems for any extended periods of time. Pregnant women or persons with existing health issues may be employed at the future project site and be present on-site during normal business hours. In addition, allowable uses at the site could potentially include a childcare center for future employee use. However, according to the typical definition of the term, the proposed project would not be considered a sensitive receptor. In addition, Health risks from TACs are typically associated with long-term exposure to high concentrations. Accordingly, methodologies for conducting health risk assessments are associated with long-term exposure periods (e.g., 24 hours per day over a 70-year lifetime). Any potential sensitive individuals at the proposed project site would not be expected to be on-site for any such long-term periods of time. The nearest existing sensitive receptors to the project site would be the multi-family residences located approximately 660 feet to the west of the site. The major pollutants of concern are localized CO emissions and TAC emissions, which are addressed in further detail below.

Localized CO Emissions

Localized concentrations of CO are related to the levels of traffic and congestion along streets and at intersections. Implementation of the proposed project would increase traffic volumes on streets near the project site; therefore, the project would be expected to increase local CO concentrations. Concentrations of CO approaching the ambient air

quality standards are only expected where background levels are high, and traffic volumes and congestion levels are high. The YSAQMD's preliminary screening methodology for localized CO emissions provides a conservative indication of whether project-generated vehicle trips would result in the generation of CO emissions that would contribute to an exceedance of AAQS. Per the YSAQMD screening methodology, if either of the following results at any intersection affected by a project, the project has the potential to result in localized CO emissions that could violate CO standards:

- A traffic study for the project indicates that the peak-hour Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity will be reduced to an unacceptable LOS (typically LOS E or F); or
- A traffic study indicates that the project will substantially worsen an already existing peak-hour LOS F on one or more streets or at one or more intersections in the project vicinity. "Substantially worsen" includes situations where delay would increase by 10 seconds or more when project-generated traffic is included.

According to the analysis within Section 4.14, Transportation and Circulation, of this EIR, the increase in traffic due to implementation of the proposed project would cause the following intersections to reduce from acceptable LOS to unacceptable LOS under Existing Plus Project conditions, according to the applicable standards of significance presented in Section 4.14:

- Covell Boulevard/Monarch Lane (a side street stop control intersection) would degrade from an acceptable LOS D to an unacceptable LOS F during the PM peak hour;
- Mace Boulevard/I-80 Westbound Ramps (a signalized intersection) would degrade from an acceptable LOS B to an unacceptable LOS F during the PM peak hour;
- Mace Boulevard/2nd Street/County Road 32A (a signalized intersection) would degrade from an acceptable LOS C to an unacceptable LOS F during the PM peak hour; and
- Mace Boulevard/Alhambra Drive (a signalized intersection) would degrade from an acceptable LOS A to an unacceptable LOS F during both the AM and PM peak hours.

All other intersections currently operate, and would continue to operate, at acceptable levels under Existing Plus Project conditions.

In addition, according to the analysis within Section 4.14, Transportation and Circulation, of this EIR, the increase in traffic due to implementation of the proposed project would degrade the following intersections under Cumulative Plus Project conditions:

- Mace Boulevard/Chiles Road (a signalized intersection) would degrade from an acceptable LOS E to an unacceptable LOS F during the PM peak hour;

- Mace Boulevard/I-80 Eastbound Ramps (an uncontrolled intersection) would degrade from an acceptable LOS C to an unacceptable LOS F during the PM peak hour;
- Mace Boulevard/I-80 Westbound Ramps (a signalized intersection) would substantially worsen an already unacceptable LOS F during the PM peak hour;
- Mace Boulevard/2nd Street/County Road 32A (a signalized intersection) would degrade from an acceptable LOS E to an unacceptable LOS F during the AM peak hour, and would substantially worsen an already unacceptable LOS F during the PM peak hour; and
- Chiles Road/I-80 Eastbound Off-ramp (an uncontrolled intersection) would degrade from an acceptable LOS C to an unacceptable LOS F during the AM peak hour, and would degrade from an acceptable LOS E to an unacceptable LOS F during the PM peak hour.

All other intersections would operate at acceptable levels under Cumulative Plus Project conditions.

Although the above conditions would trigger further CO analysis, because the Mace Boulevard/2nd Street/County Road 32A intersection under Cumulative Plus Project conditions would involve LOS F operations and the highest traffic volume during the PM peak hour in comparison to all other affected intersections, the Mace Boulevard/2nd Street/County Road 32A intersection during the PM peak hour would represent a worst-case intersection. Because the Chiles Road/I-80 Eastbound Off-ramp would involve LOS F operations and would have the highest delay during the PM peak hour under Cumulative Plus Project conditions, as well as higher traffic volumes than any of the intersections under Existing Plus Project conditions, the Chiles Road/I-80 Eastbound Off-ramp would represent another worst-case intersection. All other intersections that would be potentially affected by the proposed project would not be expected to experience CO concentrations in excess of the highest predicted CO concentrations at the Mace Boulevard/2nd Street/County Road 32A or Chiles Road/I-80 Eastbound Off-ramp intersections, as all other intersections would experience less traffic volume and delay. Therefore, the localized CO emissions associated with the Mace Boulevard/2nd Street/County Road 32A and Chiles Road/I-80 Eastbound Off-ramp intersections during the PM peak hour under Cumulative Plus Project conditions were estimated using the CALINE4 model.

All roadway segments would operate acceptably under Existing Plus Project conditions. However, according to the analysis within Chapter 5 of this EIR, the increase in traffic due to implementation of the proposed project would degrade the following roadway and freeway segments under Cumulative Plus Project conditions:

- Covell Boulevard East of Denali Drive would degrade from an acceptable LOS C to an unacceptable LOS F during the PM peak hour;

- John Jones Road North of Covell Boulevard would degrade from an acceptable LOS D to an unacceptable LOS F during the AM peak hour, and would degrade from an acceptable LOS D to an unacceptable LOS F during the PM peak hour;
- Old Davis Road north of I-80 would degrade from an acceptable LOS C to an unacceptable LOS E during the PM peak hour;
- Pole Line Road south of 5th Street would degrade from an acceptable LOS D to an unacceptable LOS F during the PM peak hour;
- Richards Boulevard east of Research Park Drive would substantially worsen an already unacceptable LOS F during the AM peak hour;
- I-80 Eastbound from Mace Boulevard to Chiles Road would substantially worsen an already unacceptable LOS F during the PM peak hour;
- I-80 Eastbound from Chiles Road to Enterprise Boulevard would degrade from an acceptable LOS E to an unacceptable LOS F during the PM peak hour;
- I-80 Westbound from Enterprise Boulevard to Chiles Road would degrade from an acceptable LOS D to an unacceptable LOS F during the AM peak hour;
- I-80 Westbound from Chiles Road to Mace Boulevard would degrade from an acceptable LOS D to an unacceptable LOS F during the AM peak hour; and

Although the above conditions would trigger further CO analysis, because the I-80 Eastbound freeway segment from Mace Boulevard to Chiles Road during the PM peak hour would involve the highest traffic count of all of the above LOS F operating segments, the I-80 Eastbound freeway segment from Mace Boulevard to Chiles Road during the PM peak hour would represent the worst-case roadway segment. All other roadway segments that would be potentially affected by the proposed project would not be expected to experience CO concentrations in excess of the highest predicted CO concentrations at the I-80 Eastbound freeway segment from Mace Boulevard to Chiles Road, as all other segments would experience a lower traffic volume. Therefore, the localized CO emissions associated with the I-80 Eastbound freeway segment from Mace Boulevard to Chiles Road during the PM peak hour under Cumulative Plus Project conditions were estimated using the CALINE4 model.

A highly conservative assumption that the nearest sensitive receptor to the worst-case intersection and roadway segment would be approximately 32 feet (10 meters) away was applied to the CALINE4 model. Table 4.3-9 shows the worst-case concentration of CO from the Mace Boulevard/2nd Street/County Road 32A intersection, the Chiles Road/I-80 Eastbound Off-ramp intersection, and the I-80 Eastbound freeway segment from Mace Boulevard to Chiles Road at a distance of approximately 32 feet (10 meters) from the center of the intersection/roadway during both 1-hour and 8-hour scenarios, which were modeled using the CALINE4 roadway dispersion model.

As shown in Table 4.3-9, the highest predicted concentrations of CO associated with the worst-case intersections and roadway segment would be well below the 1-hour and 8-hour CAAQS for CO at a distance of approximately 32 feet (10 meters). It should be noted that such a distance provides a conservative estimate, as a sensitive receptor would not be located within such close proximity to any of the potentially affected intersections

or roadways. Because all other affected intersections and roadways would involve lower volumes of traffic, less of a delay, and would be further from the nearest sensitive receptor, the CO concentrations resultant of all other intersections would be expected to be less than what has been estimated for the Mace Boulevard/2nd Street/County Road 32A intersection, the Chiles Road/I-80 Eastbound Off-ramp intersection, and the I-80 Eastbound freeway segment from Mace Boulevard to Chiles Road. Therefore, the project's impact related to a contribution to local mobile-source concentrations of CO would be less than significant.

Table 4.3-9
Maximum Predicted CO Concentrations

Intersection/Roadway Segment	CO Concentration (ppm)
1-Hour Average	
Mace Boulevard/2nd Street/County Road 32A	2.6
Chiles Road/I-80 Eastbound Off-ramp	1.7
I-80 Eastbound from Mace Boulevard to Chiles Road	4.7
State Standard	**20.0**
8-Hour Average	
Mace Boulevard/2nd Street/County Road 32A	1.6
Chiles Road/I-80 Eastbound Off-ramp	0.7
I-80 Eastbound from Mace Boulevard to Chiles Road	3.7
State Standard	**9.0**

Source: CALINE4, March 2015.

Toxic Air Contaminant (TAC) Emissions

The CARB Handbook provides recommendations for siting new sensitive land uses near sources typically associated with significant levels of TAC emissions, including, but not limited to, freeways and high traffic roads, distribution centers, and rail yards. The CARB has identified DPM from diesel-fueled engines as a TAC; thus, high volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic are identified as having the highest associated health risks from DPM. Health risks from TACs are a function of both the concentration of emissions and the duration of exposure.

Construction-related activities have the potential to generate concentrations of TACs, specifically DPM, from on-road haul trucks and off-road equipment exhaust emissions. However, construction is temporary and occurs over a relatively short duration in comparison to the operational lifetime of the proposed project. Methodologies for conducting health risk assessments are associated with long-term exposure periods (e.g., over a 70-year lifetime). As discussed in the Method of Analysis section above, the proposed project would be built out over four separate phases (see Figure 3-19 of the Project Description chapter of this EIR). Although the specific uses to be built out per phase are speculative at this time and would ultimately be based on demand, the phases are anticipated to begin in the southern portion of the MRIC site, move out to the central core, and then north and east. The anticipated development pattern would represent a logical pattern of development with structures gradually extending from the current

urbanized areas toward the City's new urban boundary. Although speculative, the project phases are currently anticipated to consist of the following:

- Phase 1: 48 acres in southern portion of MRIC site to include approximately 540,000 square feet of buildout and two access points;
- Phase 2: 29 acres south of the Mace Drainage Channel to include approximately 700,000 square feet of buildout;
- Phase 3: 700,000 square feet of buildout;
- Phase 4: Northerly 82 acres of MRIC Site to include approximately 714,000 square feet buildout.

As the MRIC would occur in phases, only portions of the MRIC site would be disturbed at a time, with operation of construction equipment occurring intermittently throughout the course of a day. All construction equipment and operation thereof would be regulated per the In-Use Off-Road Diesel Vehicle Regulation. In addition, project construction would be required to comply with all applicable YSAQMD rules and regulations. The predominant prevailing wind direction in the area is from the south, which would help to direct any potential pollutants associated with the site away from the nearest sensitive receptors, which would be the existing multi-family residences located approximately 660 feet west of the project site. Similarly, as the anticipated phases would occur from the southern portion of the site moving towards the north, the prevailing winds would direct any pollutants occurring during the later construction phases from substantially affecting any people in the already built-out portions of the MRIC per the earlier phases.

Considering the intermittent nature of construction equipment operating within an influential distance to the nearest sensitive receptors, the duration of construction activities in comparison to the operational lifetime of the project, and the typical long-term exposure periods associated with conducting health risk assessment, the likelihood that any one sensitive receptor would be exposed to high concentrations of DPM for any extended period of time would be low. Nonetheless, to ensure concentrations of DPM would not exceed the established CAAQS for PM_{10} emissions, which, as stated previously, is the maximum amount of a pollutant that can be present in outdoor air without harm to public health, dispersion modeling was performed using AERMOD for the proposed project's construction-related PM_{10} emissions.

The AERMOD results are presented in Table 4.3-10. As shown in the table, the highest 24-hour average concentration of PM_{10} associated with construction of the proposed project at a nearby sensitive receptor was estimated to be 6.93 $\mu g/m^3$, which is below the 24-hour CAAQS of 50 $\mu g/m^3$ for PM_{10} emissions. It should be noted that the highest annual average concentration of PM_{10} associated with project construction at a nearby sensitive receptor was estimated using AERMOD to be 1.17 $\mu g/m^3$, which is below the annual average CAAQS of 20 $\mu g/m^3$ for PM_{10} emissions. Because the project's construction-related concentrations of PM_{10} would be below the CAAQS, and health risks associated with exposure to DPM or any TAC are correlated with high concentrations over a long period of exposure (e.g., over a 70-year lifetime), the

temporary, intermittent construction-related DPM emissions would not be expected to cause any health risks to any nearby sensitive receptors. As such, project construction would not be expected to expose sensitive receptors to substantial concentrations of DPM.

Table 4.3-10
Maximum Construction-Related DPM Concentration at Nearest Sensitive Receptor

	DPM Concentration ($\mu g/m^3$)	Threshold of Significance ($\mu g/m^3$)
24-Hour Average	6.93	50
Annual Average	1.17	20

Source: AERMOD, July 2015.

Operational-related emissions of TACs are typically associated with stationary diesel engines or land uses that involve heavy truck traffic or idling. The YSAQMD reviews the potential for TAC emissions from new and modified stationary sources through their permitting process. Facilities and equipment that require permits from the YSAQMD are screened for risks from TACs and are required by YSAQMD to install Toxic Best Available Control Technology (T-BACT) to reduce any risks to below significance. To the extent the future on-site uses are known, the proposed project is not expected to involve long-term operation of any stationary diesel engines or other major on-site stationary source of TACs. Should any future uses involve operation of stationary sources (i.e., equipment or devices that emit or have the potential to emit pollutants regulated under the CAA), such uses would be reviewed by the YSAQMD and regulated, if necessary, through the YSAQMD's permitting program. Compliance with such would ensure that any future stationary sources would be operated appropriately and any associated emissions are within regulated limits.

The CARB's Handbook includes facilities (distribution centers) with associated diesel truck trips of more than 100 trucks per day as a source of substantial TAC emissions. The project is not a distribution center, and is not located near any existing distribution center. The proposed project would primarily be focused on research and development uses with a manufacturing component, as opposed to a distribution center or heavy manufacturing use. Based on such, the proposed project would involve a maximum conservative estimate of 20 trucks per day, which is below the 100 trucks per day criteria per CARB for a source of substantial TAC emissions. Therefore, overall, the proposed project would not expose any existing sensitive receptors to any new permanent or substantial concentrations of TAC emissions.

As discussed above, existing UPRR tracks are located approximately 70 feet from the southern boundary of the Mace Triangle and from the southern border of the MRIC anywhere from approximately 1,100 feet to 130 feet. The UPRR tracks are currently used for not only freight operations, but for Capitol Corridor passenger trains, which involve 30 passenger trains per day (nearly hourly service) during weekdays. New or expanded development is not proposed for the Mace Triangle at this time. The Mace Triangle has

been included in the overall project boundary for annexation purposes (i.e., to avoid the creation of a County island property). This EIR has assumed that the Mace Triangle, with the exception of the Park-and-Ride lot, could be developed at a later date, subject to approval of additional discretionary entitlements. As detailed in the Project Description chapter, the potential for impacts associated with 71,056 sf of new development on the Mace Triangle is considered in this EIR. A green space buffer zone would be located along the southern boundary of the MRIC site, further separating the MRIC site from the UPRR tracks. Although the passing trains may involve emission of air pollutants, CARB does not consider passing railroad trains to represent a potentially significant source of TAC emissions due to the lack of idling trains. Rail yards are considered by CARB to be a significant source of TACs due to the amount of trains and idling, and CARB recommends a 1,000-foot buffer from a rail yard. The nearest rail yard to the project site is located over 20 miles northeast of the project site. Therefore, the project would not be affected by DPM emissions associated with rail activity.

The CARB, per its Handbook, recommends the evaluation of emissions when freeways are within 500 feet of sensitive receptors. Any project placing sensitive receptors within 500 feet of a major roadway or freeway may have the potential to expose those receptors to DPM. With inclusion of a 150-foot buffer along the southern border of the MRIC site, the nearest future building to I-80 that could be built on the MRIC site would be located approximately 414 feet from the nearest travel lane along I-80 and would be separated by CR 32A and the UPRR tracks, which are at a slightly higher elevation than the proposed project site. The Mace Triangle site is located approximately 200 feet from the nearest through travel lane along I-80. Future development of the Mace Triangle could include Research, Office, Research and Development, and Ancillary Retail uses. As discussed above, the proposed project would not involve any uses that would attract children, the elderly, or those with existing health problems to the site. Pregnant employees and children at a potential childcare center may be present at the proposed project site during normal business hours. However, any potential sensitive individuals at the proposed project site would not be expected to be on-site for any long-term period of time that is typically associated with health risks (e.g., 24 hours per day over a 70-year lifetime). Because methodologies for conducting health risk assessments are associated with such long-term exposure periods and the potential for any one future sensitive user to be on-site and in close proximity to I-80 traffic for any extended period of time would be low, future sensitive individuals would not be expected to be exposed to substantial pollutant concentrations associated with I-80 traffic. Furthermore, compliance with applicable building codes would ensure that all future on-site buildings include adequate ventilation systems to warrant acceptable indoor air quality conditions. Nonetheless, as the potential exists for future on-site employees and/or children at a potential childcare center to be exposed to DPM emissions associated with nearby traffic along I-80, the risks have been evaluated.

The YSAQMD does not have a recommended protocol for analyzing DPM emissions associated with freeway traffic. However, SMAQMD has developed a screening methodology for DPM cancer risk (potential incremental cancer chances per million people) in its *Recommended Protocol for Evaluating the Location of Sensitive Land Uses*

Adjacent to Major Roadways,[21] which was utilized for this analysis. The screening level established by SMAQMD for incremental cancer risk per million due to DPM is 276 per million, which is based on the level of increased individual risk corresponding to a 70 percent reduction from the highest risk. The highest risk represents the worst-case conditions. The screening threshold is not intended to be a safe risk level or regulatory threshold, but a point at which a site-specific health risk assessment is recommended.

The screening table for incremental DPM cancer risk per million for projects north (downwind) of an east-west roadway from the SMAQMD's *Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways*[22] was used in conjunction with the estimated peak hour traffic volume along the portion of I-80 closest to the project site obtained from Caltrans.[23] In order to provide a conservative analysis, the approximate distance of 200 feet from the nearest travel lane of I-80 to the proposed development was used. According to Caltrans, the traffic volume on the segment of I-80 nearest the proposed project site is 12,100 vehicles per hour during the peak hour. The SMAQMD screening table does not offer values correlated with peak hour traffic volumes between 12,000 or 16,000 vehicles per hour. Accordingly, a conservative traffic volume of 16,000 was used for the proposed project's estimate. Using the SMAQMD screening table for a project located north (downwind) of an east-west roadway with a peak hour traffic volume of 16,000 vehicles per hour at a distance of 200 feet from the edge of the nearest travel lane, an incremental DPM cancer risk of 270 per million was estimated, which is less than that of the 276 per million screening level set forth by SMAQMD. Therefore, according to the SMAQMD's methodology and as expected based on the above discussion, a site-specific health risk assessment for DPM emissions associated with I-80 traffic is not necessary for the proposed project. Accordingly, new sensitive receptors would not be exposed to any substantial DPM emissions associated with the nearby freeway traffic.

Conclusion

Based on the above analysis, because the proposed project would not produce substantial pollutant concentrations, and is not located near any existing sources of substantial pollutant concentrations, sensitive receptors would not be exposed to significant levels of pollutant concentrations as a result of the proposed project. Thus, a ***less-than-significant*** impact would result.

Mitigation Measure(s)
None required.

[21] Sacramento Metropolitan Air Quality Management District. *Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways*. March 2011.
[22] Sacramento Metropolitan Air Quality Management District. *Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways [pg. 9]*. March 2011.
[23] California Department of Transportation, Traffic Data Branch. *2013 All Traffic Volumes on CSHS*. 2013. Available at: http://traffic-counts.dot.ca.gov/2013all/Route71-80.html. Accessed March 2015.

4.3-4 Create objectionable odors affecting a substantial number of people. Based on the analysis below, the impact is *less than significant.*

As discussed above, due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, quantitative methodologies to determine the presence of a significant odor impact do not exist. According to the YSAQMD, common types of facilities that are known to produce odors include, but are not limited to, wastewater treatment facilities, chemical or fiberglass manufacturing, landfills, composting facilities, food processing facilities, refineries, dairies, and asphalt or rending plants.[24] The proposed project is not located in the vicinity of any such existing or planned land uses.

The proposed project would include, among other uses, Research and Development and Manufacturing uses. Research and Development uses would involve laboratories for the research, design, analysis, development, and/or testing of a product. Operations at the laboratories may involve the use of chemicals that could have the potential to create objectionable odors. However, as discussed in further detail in the Hazards and Hazardous Materials section of this EIR, any chemicals would be required to be adequately stored and handled in accordance with all applicable federal, State, and local hazards regulations, including City Fire and Municipal Code requirements. Light manufacturing uses would consist of assembly or packaging of products, including but not limited to electrical, pharmaceutical, and biomedical and food products and devices, as well as associated warehousing and distribution. Heavy manufacturing, exclusive distribution, and exclusive warehousing uses would be prohibited at the project site. Depending on the product, the manufacturing process could involve operations that may produce objectionable odors. However, the nearest sensitive receptors to the site are located approximately 660 feet to the west of the site, and the proposed project would include buffer areas along the perimeter of the project site that would further separate the future on-site uses from the nearest sensitive receptors. In addition, according to the anticipated building use layout (see Figure 3-7 of Project Description chapter of this EIR), the proposed manufacturing uses would primarily be located along the northern and eastern portion of the site further increasing the buffer between the nearest sensitive receptors and the proposed manufacturing uses. As such, the proposed uses would not be expected to create objectionable odors that would affect a substantial number of people.

The YSAQMD also regulates objectionable odors through Rule 2.5 (Nuisance), which prohibits any person or source from emitting air contaminants or other material that result in any of the following: cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; endanger the comfort, repose, health, or safety of any such persons or the public; or have a natural tendency to cause injury or damage to business or property. Rule 2.5 is enforced based on complaints. If complaints

[24] Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts [pg. 14]*. July 11, 2007. Available at: http://www.ysaqmd.org/documents/CEQAHandbook2007.pdf. Accessed February 2015.

are received, the YSAQMD is required to investigate the complaint, as well as determine and ensure a solution for the source of the complaint, which could include operational modifications. Thus, although not anticipated, if odor complaints are made after the proposed project is developed, the YSAQMD would ensure that such odors are addressed and any potential odor effects reduced to less than significant.

It should be noted that diesel fumes from construction equipment are often found to be objectionable; however, construction is temporary and associated diesel emissions would be regulated in accordance with the In-Use Off-Road Diesel Vehicle Regulation, as discussed above. In addition, the proposed project would be required to comply with all applicable YSAQMD rules and regulations, including, but not limited to, Rule 2.1, Rule 2.28, and Rule 2.5, which would help to control construction-related odorous emissions. Therefore, construction of the proposed project would not be expected to create objectionable odors affecting a substantial number of people.

Existing ongoing agricultural uses are located adjacent to the MRIC site to the north, northeast, and east, including the Mace 391 and Howat permanent agricultural easements, which would be maintained as agricultural land indefinitely. Accordingly, agricultural operations would continue to occur and the future employees at the proposed project site could potentially be exposed to odors associated with the ongoing agricultural operations. The proposed project would include a minimum 150-foot agricultural buffer/agricultural transition area along the western and northern boundaries, which, per Davis Municipal Code Section 40A.01.050, would consist of a 50-foot-wide agricultural transition area located contiguous to a 100-foot-wide agricultural buffer located contiguous to the agricultural area. The agricultural buffer for the MRIC would include planned and natural spaces, as well as a biking and walking trail, which would be restricted to the inner 50-foot transitional zone. The buffer/transition area would provide a separation between the proposed project and the ongoing agricultural operations, including any pesticide applications.

In addition, consistent with Yolo County's Conditions Covering the Use of Restricted Materials, any pesticides applied near the northern and eastern boundaries of the MRIC as part of adjacent farming operations would be done using ground rigs. Depending upon the type of pesticide being applied, ground rigs are allowed to spray pesticides within 50 to 100 feet of environmental sensitive areas, which, for the MRIC, could be considered the proposed bike/pedestrian trail within the 50-foot transition zone; and, during storm events, any stormwater detained within the agricultural buffer. Use of ground rigs would minimize any drift of pesticides, where drift is the movement of pesticides through the air away from the intended target. Agricultural drift is not necessarily a result of improper or illegal applications, but could occur with every application. California has strict standards concerning drift and many rules limiting applications in order to minimize drift and associated potential harmful residues from entering the air. Rules are updated based on post-application problems encountered from legal applications. Applicators that have

been determined to improperly or illegally apply pesticides are faced with fines and other penalties.[25]

Thus, the nearby agricultural operations would not be expected to create objectionable odors that would affect a substantial number of people on the project site. Furthermore, odors associated with potential pesticide odor related to agricultural operations are addressed by the Yolo County Agricultural Commissioner. If an odor complaint is reported, a biologist representing the Yolo County Agricultural Commissioner investigates the complaint and is required to determine if a nearby pesticide application has caused the odor and if a nearby farmer has violated pesticide permit conditions. The Yolo County Agricultural Commissioner would ensure that any issue is rectified.[26]

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

Mitigation Measure(s)
None required.

4.3-5 Conflict, or create an inconsistency, with any applicable plan, policy, or regulation adopted for the purpose of avoiding or mitigating environmental effects related to air quality. Based on the analysis below, the impact is *less than significant.*

The City of Davis General Plan includes one policy related to air quality, Policy AIR 1.1, which states, "Take appropriate measures to meet the AQMD's goal for improved air quality." The policy implies that the proposed project be consistent with the YSAQMD's established air quality plans, thresholds of significance, and rules and regulations. As discussed throughout the impact discussions above, the proposed project is required to comply with all applicable YSAQMD rules and regulations. Although, as determined above, the proposed project would result in operational emissions of ROG in excess of the applicable threshold of significance, overall, the proposed project would include design features that would support the City's policy of improved air quality. Specifically, per Mitigation Measure 4.14-6 in the Transportation and Circulation section of this EIR, a Travel Demand Management (TDM) Program would be required to be implemented, which would contribute towards a reduction in VMT and an associated reduction in air pollutant emissions. In addition, the City objectives for the proposed project include, but are not limited to, the following: application of low impact development principles;

[25] California Department of Pesticide Regulation. *A Community Guide to Recognizing & Reporting Pesticide Problems.* April 2008. Available at: http://www.yolocounty.org/home/showdocument?id=4692. Accessed March 2015.

[26] California Department of Pesticide Regulation. *A Community Guide to Recognizing & Reporting Pesticide Problems.* April 2008. Available at: http://www.yolocounty.org/home/showdocument?id=4692. Accessed March 2015.

minimization of the carbon footprint of the proposed project; vehicle trip reduction via alternative transportation modes; and building envelope efficiencies.

Incorporation of the aforementioned project features would support a project-level reduction in emissions, which would contribute towards the City policy of taking appropriate measures to meet the YSAQMD's goal for improved air quality. Consequently, a finding of consistency or a finding of substantial compliance with the City's air quality policy could be made. Therefore, the proposed project would not be considered to conflict, or create an inconsistency, with an applicable plan, policy, or regulation adopted for the purpose of avoiding or mitigating environmental effects related to air quality, and impacts would be ***less than significant***.

Mitigation Measure(s)
None required.