4.3 AIR QUALITY, GREENHOUSE GAS EMISSIONS, AND ENERGY

4.3.1 INTRODUCTION

The Air Quality, Greenhouse Gas Emissions, and Energy chapter of the EIR describes the potential impacts of the Proposed Project/Biological Resources Preservation Alternative (BRPA) on local and regional air quality emissions, potential impacts related to greenhouse gas (GHG) emissions and climate change, and potential impacts related to energy. The chapter includes a discussion of the existing air quality, GHG, and energy setting, the existing regulatory setting, as well as potential local and regional air quality, GHG, and energy impacts resulting from construction and operation of the project/BRPA. In addition, the chapter includes mitigation measures warranted to reduce or eliminate any identified significant impacts. The chapter is primarily based on information and guidance within the Yolo-Solano Air Quality Management District (YSAQMD) Handbook for Assessing and Mitigating Air Quality Impacts,[1] as well as the City of Davis General Plan[2] and associated City of Davis General Plan EIR,[3] the City of Davis Climate Action and Adaptation Plan (CAAP),[4] and a technical analysis performed by Raney Planning and Management, Inc. (see Appendix C).

4.3.2 EXISTING ENVIRONMENTAL SETTING

The following information provides an overview of the existing environmental setting in relation to air quality within the Proposed Project area/ BRPA area. 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. In addition to the information pertaining to air quality, information related to climate change and GHGs, as well as energy, is provided.

Air Basin Characteristics

The City of Davis is located in Yolo County, within the Yolo-Solano portion of the Sacramento Valley Air Basin (SVAB), which is under the jurisdiction of the YSAQMD. 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 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

1 Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts*. July 11, 2007.
2 City of Davis. *Davis General Plan*. Adopted May 2001, Amended January 2007.
3 City of Davis. *Final Program EIR for the City of Davis General Plan Update and Final Project EIR for Establishment of a New Junior High School*. Certified May 2001.
4 City of Davis. *Climate Action and Adaptation Plan*. April 18, 2023.

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]

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 autumn and early winter 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 the 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

Both the U.S. Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB) have established AAQS for common pollutants. The federal standards are divided into primary standards, which are designed to protect the public health, and secondary standards, which are designed to protect the public welfare. The AAQS for each contaminant represent safe levels that avoid specific adverse health effects. Pollutants for which AAQS have been established are called "criteria" pollutants. Table 4.3-1 identifies the major pollutants, characteristics, health effects and typical sources. The national and California AAQS (NAAQS and CAAQS, respectively) are summarized in Table 4.3-2. The NAAQS and CAAQS were developed independently with differing purposes and methods. As a result, the national and State standards differ in some cases. In general, the State of California standards are more stringent than the federal standards, particularly for ozone and particulate matter (PM).

A description of each criteria pollutant and its potential health effects is provided in the following section.

Ozone

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

[5] Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts*. July 11, 2007.

Table 4.3-1
Summary of Criteria Pollutants

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

Sources:

- ***CARB. California Ambient Air Quality Standards (CAAQS). Available at: https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards. Accessed March 2024.***
- ***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: sparetheair.com. Accessed March 2024.***
- ***CARB. Glossary of Air Pollution Terms. Available at: https://ww2.arb.ca.gov/glossary. Accessed March 2024.***

Table 4.3-2
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	0.070 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	9 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: CARB. Ambient Air Quality Standards. July 16, 2024. Available at: https://ww2.arb.ca.gov/sites/default/files/2024-08/AAQS%20Table_ADA_FINAL_07222024.pdf. Accessed November 2024.

The primary source of ozone precursors is mobile sources, including cars, trucks, buses, construction equipment, and agricultural equipment.

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

Reactive Organic Gas

ROG refers to several reactive chemical gases composed of hydrocarbon compounds typically found in paints and solvents that contribute to the formation of smog and ozone by involvement

in atmospheric chemical reactions. A separate health standard does not exist for ROG. However, some compounds that make up ROG are toxic, such as the carcinogen benzene.

Oxides of Nitrogen

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

Nitrogen Dioxide

A particular oxide of nitrogen that is of concern to human health is NO_2. NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide (NO), which is a colorless, odorless gas.

A large body of health science literature indicates that exposure to NO_2 can induce adverse health effects. The strongest health evidence, and the health basis for the AAQS for NO_2, results from controlled human exposure studies that show that NO_2 exposure can intensify responses to allergens in allergic asthmatics. In addition, several epidemiological studies have demonstrated associations between NO_2 exposure and premature death, cardiopulmonary effects, decreased lung function growth in children, respiratory symptoms, emergency room visits for asthma, and intensified allergic responses. Infants and children are particularly at risk because they have disproportionately higher exposure to NO_2 than adults due to their greater breathing rate for their body weight and their typically greater outdoor exposure duration. Several studies have shown that long-term NO_2 exposure during childhood, the period of rapid lung growth, can lead to smaller lungs at maturity in children with higher compared to lower levels of exposure. In addition, children with asthma have a greater degree of airway responsiveness compared with adult asthmatics. In adults, the greatest risk is to people who have chronic respiratory diseases, such as asthma and chronic obstructive pulmonary disease.

Carbon Monoxide

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

Sulfur Dioxide

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

Particulate Matter

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

- "Inhalable coarse particles ($PM_{2.5-10}$)," which are found near roadways and dusty industries, are between 2.5 and 10 micrometers in diameter. $PM_{2.5-10}$ is deposited in the thoracic region of the lungs.
- "Fine particles ($PM_{2.5}$)," which are found in smoke and haze, are 2.5 micrometers in diameter and smaller. $PM_{2.5}$ particles could be directly emitted from sources such as forest fires, or could form when gases emitted from power plants, industries, and automobiles react in the air. They penetrate deeply into the thoracic and alveolar regions of the lungs.
- "Ultrafine particles (UFP)," are very, very small particles (less than 0.1 micrometers in diameter) largely resulting from the combustion of fossil fuels, meat, wood, and other hydrocarbons. While UFP mass is a small portion of $PM_{2.5}$, their high surface area, deep lung penetration, and transfer into the bloodstream could result in disproportionate health impacts relative to their mass. UFP is not currently regulated separately, but is analyzed as part of $PM_{2.5}$.

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

Lead

Lead is a relatively soft and chemically resistant metal that is a natural constituent of air, water, and the biosphere. Lead forms compounds with both organic and inorganic substances. As an air pollutant, lead is present in small particles. Sources of lead emissions in California include a variety of industrial activities. Gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels. The use of leaded fuel has been mostly phased out, with the result that ambient concentrations of lead have dropped dramatically. However, because lead was emitted in large amounts from vehicles when leaded gasoline was used, lead is present in many soils (especially urban soils) as a result of airborne dispersion and could become re-suspended into the air.

Because lead is slowly excreted by the human body, exposures to small amounts of lead from a variety of sources could accumulate to harmful levels. Effects from inhalation of lead above the

level of the AAQS may include impaired blood formation and nerve conduction. Lead can adversely affect the nervous, reproductive, digestive, immune, and blood-forming systems. Symptoms could include fatigue, anxiety, short-term memory loss, depression, weakness in the extremities, and learning disabilities in children. Lead also causes cancer.

Sulfates

Sulfates are the fully oxidized ionic form of sulfur and are colorless gases. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. The sulfur is oxidized to SO_2 during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features.

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

Hydrogen Sulfide

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

Vinyl Chloride

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

Visibility Reducing Particles

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

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are also a category of environmental concern. TACs are present in many types of emissions with varying degrees of toxicity. Public exposure to TACs can result from emissions from normal operations, as well as accidental releases. Common stationary sources of TACs include gasoline stations, dry cleaners, and diesel backup generators, which are subject to YSAQMD stationary source permit requirements. The other, often more significant, common source type is on-road motor vehicles, such as cars and trucks, on freeways and roads, and off-road sources such as construction equipment, ships, and trains.

Fossil fueled combustion engines, including those used in cars, trucks, and some pieces of construction equipment, 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, toluene, xylenes, and acetaldehyde. Gasoline vapors contain several TACs, including benzene, toluene, and xylenes. Diesel engines emit a complex mixture of air pollutants, including both gaseous and solid material. The solid material in diesel exhaust, DPM, is composed of carbon particles and numerous organic compounds, including over 40 known cancer-causing organic substances. Examples of such chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene. Diesel exhaust also contains gaseous pollutants, including ROG and NO_X. Due to the published evidence of a relationship between diesel exhaust exposure and lung cancer and other adverse health effects, the CARB has identified DPM from diesel-fueled engines as a TAC. Although a variety of TACs are emitted by fossil fueled combustion engines, the cancer risk due to DPM exposure represents a more significant risk than the other TACs discussed above.[6]

More than 90 percent of DPM is less than one micrometer in diameter, and, thus, DPM is a subset of $PM_{2.5}$. As a California statewide average, DPM comprises about eight percent of $PM_{2.5}$ in outdoor air, although DPM levels vary regionally due to the non-uniform distribution of sources throughout the State. Most major sources of diesel emissions, such as ships, trains, and trucks, operate in and around ports, rail yards, and heavily-traveled roadways. Such areas are often located near highly populated areas. Thus, elevated DPM levels are mainly an urban problem, with large numbers of people exposed to higher DPM concentrations, resulting in greater health consequences compared to rural areas.

Due to the high levels of diesel activity, high volume freeways, stationary diesel engines, rail yards 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.

The size of diesel particulates that are of the greatest health concern are fine particles (i.e., $PM_{2.5}$) and UFPs. The small diameter of UFPs imparts the particulates with unique attributes, such as high surface areas and the ability to penetrate deeply into lungs. Once UFPs have been deposited in lungs, the small diameter allows the UFPs to be transferred to the bloodstream. The high surface area of the UFPs also allows for a greater adsorption of other chemicals, which are transported along with the UFPs into the bloodstream of the inhaler, where the chemicals can eventually reach critical organs.[7] The penetration capability of UFPs may contribute to adverse health effects related to heart, lung, and other organ health.[8] UFPs are a subset of DPM and activities that create large amounts of DPM, such as the operations involving heavy diesel-powered engines, also release UFPs. Considering that UFPs are a subset of DPM, and DPM represents a subset of $PM_{2.5}$, estimations of either concentrations or emissions of $PM_{2.5}$ or DPM include UFPs.

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 can include birth

6 California Air Resources Board. *Reducing Toxic Air Pollutants in California's Communities*. February 6, 2002.
7 Health Effects Institute. *Understanding the Health Effects of Ambient Ultrafine Particles*. January 2013.
8 South Coast Air Quality Management District. *Final 2012 Air Quality Management Plan*. December 2012.

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

Naturally Occurring Asbestos

Another concern related to air quality is naturally occurring asbestos (NOA). Asbestos is a term used for several types of naturally-occurring fibrous minerals found in many parts of California. The most common type of asbestos is chrysotile, but other types are also found in California. When rock containing asbestos is broken or crushed, asbestos fibers may be released and become airborne. Exposure to asbestos fibers may result in health issues such as lung cancer, mesothelioma (a rare cancer of the thin membranes lining the lungs, chest and abdominal cavity), and asbestosis (a non-cancerous lung disease which causes scarring of the lungs). Because asbestos is a known carcinogen, NOA is considered a TAC. Sources of asbestos emissions include: unpaved roads or driveways surfaced with ultramafic rock; construction activities in ultramafic rock deposits; or rock quarrying activities where ultramafic rock is present.

According to mapping prepared by the California Geological Survey, Yolo County is not in an area likely to contain NOA.[9] Therefore, NOA is not expected to be present at the project site/BRPA site.

Attainment Status and Regional Air Quality Plans

The Federal Clean Air Act (FCAA) and the California Clean Air Act (CCAA) require all areas of California to be classified as attainment, nonattainment, or unclassified as to their status with regard to the NAAQS and/or CAAQS. Areas not meeting the NAAQS presented in Table 4.3-2, 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. Because of the differences between the national and State standards, the designation of nonattainment areas is different under the federal and State legislation. The FCAA 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 FCAA 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 CCAA. The CCAA classifies ozone nonattainment areas as moderate, serious, severe, and extreme based on severity of violations of CAAQS. The CCAA requires local air pollution control districts with air quality that is in violation of CAAQS to prepare air quality attainment plans that demonstrate district-wide emission reductions of five percent per year averaged over consecutive three-year periods, unless an approved alternative measure of progress is developed.

[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.

Table 4.3-3 below presents the current attainment status of the jurisdictional area of the YSAQMD, including Yolo County. As shown in the table, Yolo County is in an area designated as 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 nonattainment area for the 1-hour ozone standard, nonattainment for the 8-hour ozone standard, nonattainment for the PM_{10} 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 Sutter County (southern portion), attained the revoked 1-hour ozone NAAQS. The determination became effective November 19, 2012.

Table 4.3-3
Attainment Status

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

Source: YSAQMD. Attainment Status. Available at: https://www.ysaqmd.org/plans-data/attainment/. Accessed March 2024.

In compliance with the FCAA and CCAA, 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 PM. 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 discussion of this chapter.

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 local air quality monitoring station to the project site/BRPA site is the Davis-UCD Campus station, located along Campbell Road between Hutchinson Drive and Garrod Road in Davis, approximately 2.75 miles from the project site/BRPA

site. The Davis-UCD Campus station does not have data available for $PM_{2.5}$ or PM_{10}; thus, the nearest station with $PM_{2.5}$ and PM_{10} data was used, which was the Woodland-Gibson Road station located at 41929 Gibson Road in Woodland, approximately seven miles northwest of the project site/BRPA site. Table 4.3-4 presents the number of days that the NAAQS and CAAQS were exceeded for the three-year period from 2021 to 2023.

Table 4.3-4
Air Quality Data Summary (2021-2023)

Pollutant	Standard	Days Standard Was Exceeded		
		2021	2022	2023
1-Hour Ozone	State	0	0	0
	Federal	0	0	0
8-Hour Ozone	State	3	1	0
	Federal	2	1	0
24-Hour $PM_{2.5}$	Federal	0	0	1
24-Hour PM_{10}	State	4	2	2
	Federal	0	0	0
1-Hour Nitrogen Dioxide	State	0	0	0
	Federal	0	0	0

Source: CARB. Aerometric Data Analysis and Management (iADAM) System. Available at http://www.arb.ca.gov/adam/welcome.html. Accessed November 2024.

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. Adverse effects of odors on residential areas and other sensitive receptors warrant the closest scrutiny; but consideration is 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 could be generated from a variety of source types including both construction and operational activities. 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 near any of the aforementioned odor-generating uses.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others, due to the types of population groups or activities involved. 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, day care centers, playgrounds, and medical facilities. In the vicinity of the project site/BRPA site, sensitive land uses include residential uses to the west, south, and east, with the nearest residences located approximately 150 feet from the project site's/BRPA site's eastern boundary.

Greenhouse Gas Emissions

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

The primary GHG emitted by human activities is CO_2, with the next largest components being CH_4 and N_2O. A wide variety of human activities result in the emission of CO_2. Some of the largest sources of CO_2 include the burning of fossil fuels for transportation and electricity, industrial processes including fertilizer production, agricultural processing, and cement production. The primary sources of CH_4 emissions include domestic livestock sources, decomposition of wastes in landfills, releases from natural gas systems, coal mine seepage, and manure management. The main human activities producing N_2O are agricultural soil management, fuel combustion in motor vehicles, nitric acid production, manure management, and stationary fuel combustion. Emissions of GHG by economic sector indicate that transportation-related activities account for the majority of U.S. emissions. Transportation is the largest single-source of GHG emissions, and electricity generation is the second largest source, followed by industrial activities. The agricultural, commercial, and residential sectors account for the remainder of GHG emission sources.[10]

Emissions of GHG are partially offset by uptake of carbon and sequestration in trees, agricultural soils, landfilled yard trimmings and food scraps, and absorption of CO_2 by the Earth's oceans. Additional emission reduction measures for GHG could include, but are not limited to, compliance with local, State, or federal plans or strategies for GHG reductions, on-site and off-site mitigation, and project design features. Attainment concentration standards for GHGs have not been established by the federal or State government.

Global Warming Potential

Global warming potential (GWP) is one type of simplified index (based upon radiative properties) that can be used to estimate the potential future impacts of emissions of various gases. According to the USEPA, the GWP of a gas, or aerosol, to trap heat in the atmosphere is the "cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas." The reference gas for comparison is CO_2. GWP is based

[10] U.S. Environmental Protection Agency. *Sources of Greenhouse Gas Emissions*. Available at: https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions. Accessed March 2024.

on a number of factors, including the heat-absorbing ability of each gas relative to that of CO_2, as well as the decay rate of each gas relative to that of CO_2. Each gas's GWP is determined by comparing the radiative forcing associated with emissions of that gas versus the radiative forcing associated with emissions of the same mass of CO_2, for which the GWP is set at one. Methane gas, for example, is estimated by the USEPA to have a comparative global warming potential 25 times greater than that of CO_2, as shown in Table 4.3-5.

Table 4.3-5
GWPs and Atmospheric Lifetimes of Select GHGs

Gas	Atmospheric Lifetime (years)	GWP (100-year time horizon)
Carbon Dioxide (CO_2)	See footnote[1]	1
Methane (CH_4)	12	25
Nitrous Oxide (N_2O)	114	298
HFC-23	270	14,800
HFC-134a	14	1,430
HFC-152a	1.4	124
PFC: Tetrafluoromethane (CF_4)	50,000	7,390
PFC: Hexafluoroethane (C_2F_6)	10,000	12,200
Sulfur Hexafluoride (SF_6)	3,200	22,800

[1] For a given amount of CO_2 emitted, some fraction of the atmospheric increase in concentration is quickly absorbed by the oceans and terrestrial vegetation, some fraction of the atmospheric increase will only slowly decrease over a number of years, and a small portion of the increase will remain for many centuries or more.

Source: USEPA. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019 [Table 1-2]. April 14, 2021.

As shown in the table, at the extreme end of the scale, sulfur hexafluoride is estimated to have a comparative GWP 22,800 times that of CO_2. The atmospheric lifetimes of such GHGs are estimated by the USEPA to vary from 50 to 200 years for CO_2, to 50,000 years for CF_4. Longer atmospheric lifetimes allow GHG to buildup in the atmosphere; therefore, longer lifetimes correlate with the GWP of a gas. The common indicator for GHG is expressed in terms of metric tons of CO_2 equivalents ($MTCO_2e$), which is calculated based on the GWP for each pollutant.

Effects of Global Climate Change

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. The Intergovernmental Panel on Climate Change's (IPCC) Climate Change 2021: The Physical Science Basis report indicated that warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia.[11] Signs that global climate change has occurred include:

- Warming of the atmosphere and ocean;
- Diminished amounts of snow and ice;
- Rising sea levels; and
- Ocean acidification.

[11] Intergovernmental Panel on Climate Change. *Climate Change 2021: The Physical Science Basis Summary for Policymakers*. Available at: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf. Accessed March 2024.

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. The Office of Environmental Health Hazard Assessment (OEHHA) identified various indicators of climate change in California, which are scientifically based measurements that track trends in various aspects of climate change. Many indicators reveal discernable evidence that climate change is occurring in California and is having significant, measurable impacts in the State. Changes in the State's climate have been observed, including:

- An increase in annual average air temperature with record warmth in recent years;
- More frequent extreme heat events;
- More extreme drought;
- A decline in winter chill; and
- An increase in variability of statewide precipitation.

Warming temperatures and changing precipitation patterns have altered California's physical systems—the ocean, lakes, rivers and snowpack—upon which the State depends. Winter snowpack and spring snowmelt runoff from the Sierra Nevada and southern Cascade Mountains provide approximately one-third of the State's annual water supply. Impacts of climate on physical systems have been observed, such as high variability of snow-water content (i.e., amount of water stored in snowpack), decrease in snowmelt runoff, glacier change (loss in area), rise in sea levels, increase in average lake water temperature and coastal ocean temperature, and a decrease in dissolved oxygen in coastal waters. Impacts of climate change on biological systems, including humans, wildlife, and vegetation, have also been observed, including climate change impacts on terrestrial, marine, and freshwater ecosystems. However, it should be noted that the effects of climate change are not fully understood. For example, due to a series of atmospheric rivers that occurred throughout the 2022-2023 winter season, California saw the most snow the State has seen since the record was set in the 1982-1983 winter season. The California Department of Water Resources (DWR) has noted that the snowpack in the Sierra was 205 percent of the average in February 2023,[12] 190 percent of the average for March 2023,[13] 237 percent of the average for April 2023,[14] and 254 percent of the average for May of 2023.[15]

Nonetheless, according to the Climate Change Vulnerability Assessment conducted as part of the City's CAAP, like much of California, the City is already experiencing impacts from extreme heat events, flooding and extreme precipitation, drought and poor air quality caused by wildfire smoke. The Climate Change Vulnerability Assessment identified how such impacts are likely to change through mid-century and end-of-century timeframes. Specifically, projected changes

[12] California Department of Water Resources. *Second Snow Survey Reflects Boost from Atmospheric Rivers.* Available at: https://water.ca.gov/News/News-Releases/2023/Feb-23/Second-Snow-Survey-Reflects-Boost-from-Atmospheric-Rivers. Accessed March 2024.

[13] California Department of Water Resources. *California's Snowpack Shows Huge Gains from Recent Storms.* Available at: https://water.ca.gov/News/News-Releases/2023/March-23/March-2023-Snow-Survey. Accessed March 2024.

[14] California Department of Water Resources. *California's Snowpack is Now One of the Largest Ever, Bringing Drought Relief, Flooding Concerns.* Available at: https://water.ca.gov/News/News-Releases/2023/April-23/Snow-Survey-April-2023. Accessed March 2024.

[15] California Department of Water Resources. *DWR Conducts May 1 Snow Survey to Continue to Collect Data on Spring Runoff.* Available at: https://water.ca.gov/News/News-Releases/2023/May-2023/May-2023-Snow-Survey. Accessed March 2024.

include an increase in the number of extreme heat days, increased wildfire frequency and intensity, more intense precipitation events, and more frequent and/or prolonged droughts.[16]

Energy Use in California

California is one of the highest energy demanding states within the nation. According to the U.S. Department of Energy, the State consumes approximately 303,300 gigawatt-hours (GWh) of electricity per year.[17] Activities such as heating and cooling structures, lighting, the movement of goods, agricultural production, and other facets of daily life consume a variety of energy sources. However, despite California's high rate of energy use, the State has one of the lowest per capita energy consumption levels in the U.S.

In 2022, California was the fourth-largest electricity producer in the nation. Energy within the State is provided primarily to consumers through a mix of sources including natural gas, hydroelectric, non-hydroelectric renewable sources, nuclear, coal, and petroleum. California is the nation's top producer of electricity from solar, geothermal, and biomass energy. Renewable resources, including hydroelectric power and small-scale (less than 1-megawatt [MW]), customer-sited solar photovoltaic (PV) systems, accounted for 49 percent of California's in-state electricity generation; natural gas-fired power plants fueled another 42 percent of the State's energy generation; and nuclear power supplied almost all the rest.

Figure 4.3-1 presents the sources that are used to produce energy in the State. As presented therein, energy is mostly generated from natural gas combustion, followed by non-hydroelectric renewables (such as wind and solar) and hydroelectric.

Figure 4.3-2 presents energy consumption within California for the most recent year for which data is available (2021). As shown in the figure, transportation-related activity consumes the largest single share of energy within the State. The second largest consumer is the industrial sector.

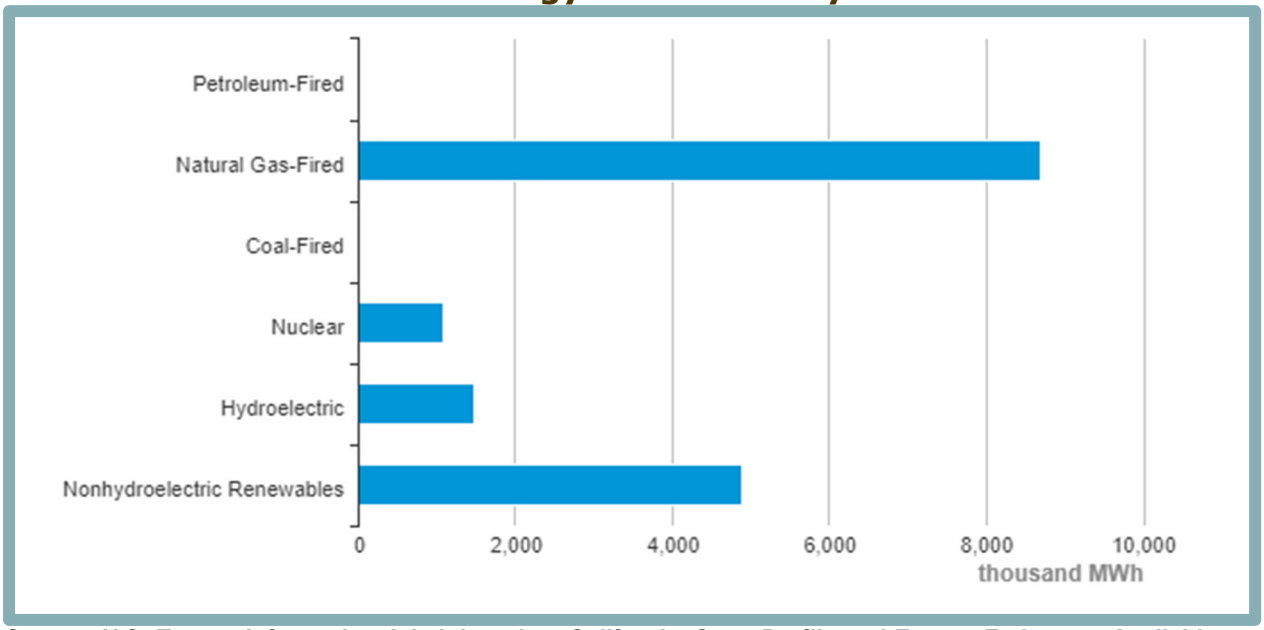
Of the total electricity supplied to the State in the year 2022, Yolo County consumed approximately 1,797 GWh,[18] which constitutes approximately 0.6 percent of the total energy consumed annually within the State.

Energy Consumption Within the City of Davis and at the Project Site

Historically, electricity and natural gas has been supplied to the City of Davis by the Pacific Gas and Electric Company (PG&E). However, on October 25, 2016, the Davis City Council adopted Resolution Number 16-153, Series 2016, which approved the Joint Exercise of Powers Agreement with Yolo County to form the Valley Clean Energy Alliance, now referred to as Valley Clean Energy (VCE). The resolution adopted by the City, along with similar resolutions adopted by the City of Woodland and Yolo County, led to the formation of the VCE Joint Powers Authority.

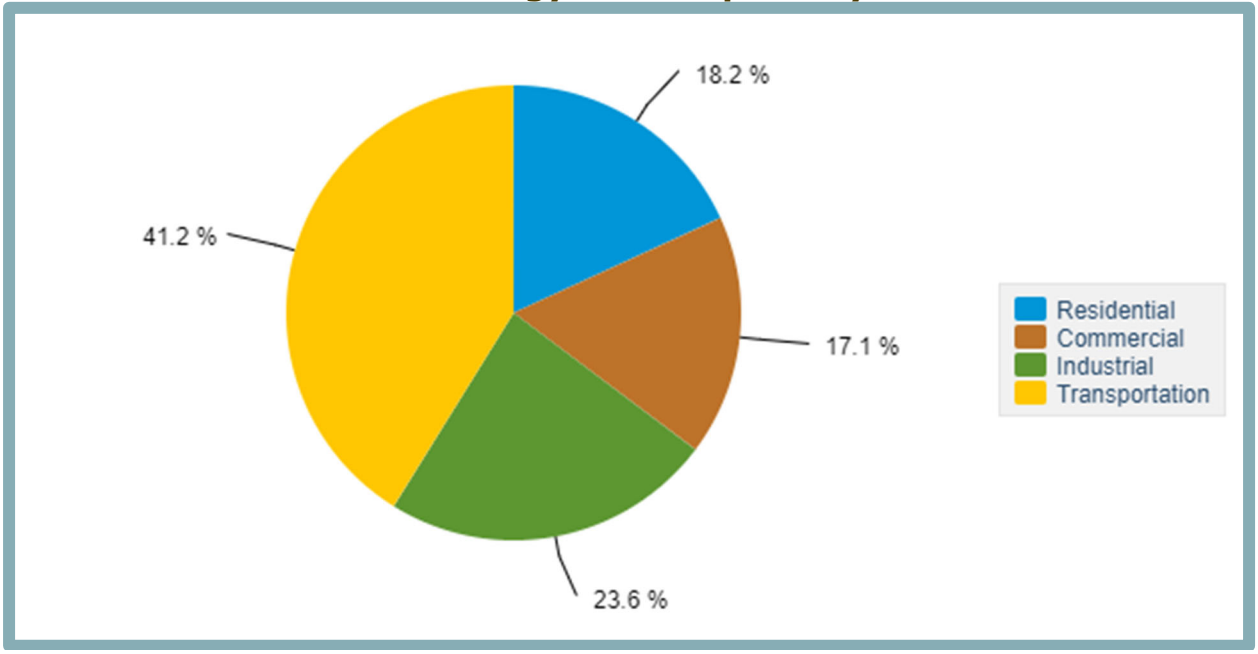
[16] City of Davis. *Climate Action and Adaptation Plan* [pg. 42]. April 18, 2023.
[17] U.S. Department of Energy. *State of California Energy Sector Risk Profile.* March 2021.
[18] California Energy Commission. *Electricity Consumption by County*. Available at: http://ecdms.energy.ca.gov/elecbycounty.aspx. Accessed March 2024.

Figure 4.3-1
California Energy Generation by Source



Source: U.S. Energy Information Administration. California: State Profile and Energy Estimates. Available at: https://www.eia.gov/state/index.php?sid=CA. Accessed March 2024.

Figure 4.3-2
California Energy Consumption by Sector



Source: U.S. Energy Information Administration. California: State Profile and Energy Estimates. Available at: https://www.eia.gov/state/index.php?sid=CA. Accessed March 2024.

Beginning in June 2018, the VCE started serving the electricity needs of the cities of Woodland and Davis, as well as unincorporated areas of Yolo County. Customers within the participating areas have the opportunity to continue receiving service from PG&E or to receive energy from VCE. VCE plans to provide energy with a higher renewable content and lower associated GHG emissions than PG&E. While VCE supplies the energy for customers enrolled in the VCE program, VCE electricity is transmitted through PG&E owned and operated distribution and power lines. PG&E will continue to provide natural gas supplies to the City. It should be noted that a Pacific Gas and Electric Co. (PG&E) easement occurs along the western and northern site boundaries.

Given the existing nature of the project site/BRPA site, which consists of generally flat agricultural land with a water tank house located in the southern portion of the site, the existing energy demand associated with the project site/BRPA site is little to null.

Public Safety Power Shutoffs

In an effort to prevent fires, PG&E initiated public safety power shutoffs (PSPS) in 2019, which may continue in subsequent years until fire risks associated with power lines are decreased. PSPS events involve PG&E turning off electrical service during times when the weather is predicted to have a heightened fire risk from gusty winds and dry conditions. Dependent on the fire risks, the power outage events may occur in specific areas or for all PG&E customers across the City. Based on the project site's location, the site is located within an area that is more likely to be affected by a PSPS event.[19] Areas more likely to be affected by a PSPS event include areas where PSPS events have previously occurred, or areas in or near high fire-risk areas. However, according to PG&E, zero PSPS events have occurred within the City of Davis since the initiative began in 2019.

4.3.3 REGULATORY CONTEXT

Air quality, GHG emissions, and energy consumption are 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 project area and monitoring or reducing GHG emissions and energy consumption are discussed below.

Federal Regulations Related to Air Quality

The following discussion provides a summary of the federal regulations relevant to air quality, organized by pollutant type.

Criteria Pollutants

The FCAA, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The USEPA is responsible for implementing most aspects of the FCAA, including setting NAAQS for major air pollutants; setting hazardous air pollutant standards; approving state attainment plans; setting motor vehicle emission standards; issuing stationary source emission standards and permits; and establishing acid rain control measures, stratospheric ozone

[19] Pacific Gas & Electric Co. *Interactive PSPS Planning Map.* Available at: https://vizmap.ss.pge.com/?_ga=2.94997403.624386528.1664230975-1068345172.1664230975. Accessed March 2024.

protection measures, and enforcement provisions. Under the FCAA, NAAQS are established for the following criteria pollutants: ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The NAAQS (other than for ozone, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for ozone, NO_2, SO_2, PM_{10}, $PM_{2.5}$ are based on statistical calculations over one- to three-year periods, depending on the pollutant. The FCAA requires the USEPA to reassess the NAAQS at least every five years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a state implementation plan that demonstrates how those areas will attain the standards within mandated time frames.

Hazardous Air Pollutants/Toxic Air Contaminants

The 1977 FCAA amendments required the USEPA to identify national emission standards for hazardous air pollutants to protect public health and welfare. Hazardous air pollutants include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 FCAA Amendments, which expanded the control program for hazardous air pollutants, 189 substances and chemical families were identified as hazardous air pollutants.

Federal Regulations Related to GHG Emissions

The following are the federal regulations relevant to GHG emissions.

Federal Vehicle Standards

In 2010, President Obama issued a memorandum directing the Department of Transportation, Department of Energy, USEPA, and National Highway Traffic Safety Administration (NHTSA) to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, the USEPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017 through 2025 light-duty vehicles. The proposed standards were projected to achieve emission rates as low as 163 grams of CO_2 per mile by model year 2025 on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if the foregoing emissions level was achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017 through 2021 (77 FR 62624–63200), and NHTSA intended to set standards for model years 2022 through 2025 in future rulemaking.

In August 2016, the USEPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program would have applied to vehicles with model years 2018 through 2027 for certain trailers, and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans, and all types of sizes of buses and work trucks. The final standards were expected to lower CO_2 emissions by approximately 1.1 billion metric tons (MT), and reduce oil consumption by up to two billion barrels over the lifetime of the vehicles sold under the program.

In August 2018, the USEPA and NHTSA proposed to amend certain fuel economy and GHG standards for passenger cars and light trucks and establish new, less-stringent standards for model years 2021 through 2026. Compared to maintaining the post-2020 standards that were previously in place, the 2018 proposal would increase U.S. fuel consumption by approximately

0.5 million barrels per day, and would impact the global climate by 3/1000th of one degree Celsius by 2100. California and other states stated their intent to challenge federal actions that would delay or eliminate GHG reduction measures, and committed to cooperating with other countries to implement global climate change initiatives.

On September 27, 2019, the USEPA and NHTSA published the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program (84 FR 51,310), which became effective November 26, 2019. The Part One Rule revokes California's authority to set its own GHG emissions standards and set zero-emission-vehicle mandates in California. On March 31, 2020, the USEPA and NHTSA issued the Part Two Rule, which sets CO_2 emissions standards and corporate average fuel economy standards for passenger vehicles and light-duty trucks for model years 2021 through 2026. On January 20, 2021, an Executive Order (EO) was issued on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, which includes review of the Part One Rule by April 2021 and review of the Part Two Rule by July 2021. In response to the Part One Rule, in December 2021, the U.S. Department of Transportation withdrew its portions of the "SAFE I" rule. As a result, states are now allowed to issue their own GHG emissions standards and zero-emissions vehicle mandates.[20] In addition, the Part Two Rule was adopted to revise the existing national GHG emission standards for passenger cars and light trucks through model year 2026. These standards are the strongest vehicle emissions standards ever established for the light-duty vehicle sector and will result in avoiding more than three billion tons of GHG emissions through 2050.[21]

Federal Regulations Related to Energy

The following are the federal regulations relevant to energy.

Energy Policy and Conservation Act

The Energy Policy and Conservation Act was originally enacted in 1975 with the intention of ensuring that all vehicles sold in the U.S. meet established fuel economy standards. Following congressional establishment of the original set of fuel economy standards the U.S. Department of Transportation was tasked with establishing additional on-road vehicle standards and making revisions to standards as necessary. Compliance with established standards is based on manufacturer fleet average fuel economy, which originally applied to both passenger cars and light trucks but did not apply to heavy-duty vehicles exceeding 8,500 pounds in gross vehicle weight. The fuel economy program implemented under the Energy Policy and Conservation Act is known as the Corporate Average Fuel Economy (CAFE) Standards. Updates to the CAFE standards since original implementation have increased fuel economy requirements and begun regulation of medium- and heavy-duty vehicles.

Energy Policy Act of 2005

The Energy Policy Act of 2005 addressed energy production in the U.S. from various sources. In particular, the Energy Policy Act of 2005 included tax credits, loans, and grants for the implementation of energy systems that would reduce GHG emissions related to energy production.

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[20] National Highway Traffic Safety Administration. *In Removing Major Roadblock to State Action on Emissions Standards, U.S. Department of Transportation Advances Biden-Harris Administration's Climate and Jobs Goals.* Available at: https://www.nhtsa.gov/press-releases/cafe-preemption-final-rule. Accessed March 2024.

[21] U.S. Environmental Protection Agency. *Final Rule to Revise Existing National GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026*. Available at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-revise-existing-national-ghg-emissions. Accessed March 2024.

State Regulations Related to Air Quality

The following discussion summarizes applicable State regulations related to air quality, organized by pollutant type. Only the most prominent and applicable California air quality-related legislation is included below. 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).

Criteria Air Pollutants

The FCAA delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB, which became part of the California Environmental Protection Agency (CalEPA) in 1991, is responsible for ensuring implementation of the CCAA of 1988, responding to the FCAA, and regulating emissions from motor vehicles and consumer products.

CARB has established CAAQS, which are generally more restrictive than the NAAQS. The CAAQS describe adverse conditions; that is, pollution levels must be below these standards before a basin can attain the standard. Air quality is considered "in attainment" if pollutant levels are continuously below the CAAQS and do not violate the standards more than once each year. The CAAQS for ozone, CO, SO_2 (one-hour and 24-hour), NO_2, PM_{10}, $PM_{2.5}$, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. The NAAQS and CAAQS are presented in Table 4.3-2.

Hazardous Air Pollutants/Toxic Air Contaminants

The State Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807 (Tanner), and involved definition of a list of TACs. The California TAC list identifies more than 700 pollutants, of which carcinogenic and noncarcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. The State list of TACs includes the federally-designated hazardous air pollutants. In 1987, the Legislature enacted the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) to address public concern over the release of TACs into the atmosphere. AB 2588 law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hot spots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over five years. TAC emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment, and, if specific thresholds are exceeded, the facility operator is required to communicate the results to the public in the form of notices and public meetings.

CARB Air Quality and Land Use Handbook

CARB's Air Quality and Land Use Handbook: A Community Health Perspective (CARB 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 (GDFs).[22] 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-405 and Interstate-

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

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."[23]

Importantly, the Introduction chapter 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."[24]

Diesel Particulate Matter

In 2000, CARB approved a comprehensive diesel risk reduction plan to reduce diesel emissions, including DPM, from new and existing diesel-fueled vehicles and engines. The regulation was anticipated to result in an 80 percent decrease in statewide diesel health risk by 2020 compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In-Use Off-Road Diesel Vehicle Regulation, and the New Off-Road Compression-Ignition (Diesel) Engines and Equipment program. The aforementioned regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel-powered equipment. Several Airborne Toxic Control Measures (ATCMs) exist that reduce diesel emissions, including In-Use Off-Road Diesel-Fueled Fleets (13 California Code of Regulations [CCR] 2449 et seq.) and In-Use On-Road Diesel-Fueled Vehicles (13 CCR 2025).

Heavy-Duty Diesel Truck and Bus Regulation

CARB adopted the final Heavy-Duty Truck and Bus Regulation, Title 13, Division 3, Chapter 1, Section 2025, on December 31, 2014, to reduce DPM and NO_X emissions from heavy-duty diesel vehicles. The rule requires nearly all diesel trucks and buses to be compliant with the 2010 model year engine requirement by January 1, 2023. CARB also adopted an ATCM to limit idling of diesel-fueled commercial vehicles on December 12, 2013. The rule requires diesel-fueled vehicles with gross vehicle weights greater than 10,000 pounds to idle no more than five minutes at any location (13 CCR 2485).

California Health and Safety Code Section 41700

Section 41700 of the Health and Safety Code states that a person must not discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any of those persons or the public; or that cause, or have

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

a natural tendency to cause, injury or damage to business or property. Section 41700 also applies to sources of objectionable odors.

Heavy-Duty Vehicle Idling Emission Reduction Program

On October 20, 2005, CARB approved a regulatory measure to reduce emissions of toxics and criteria pollutants by limiting idling of new and in-use sleeper berth equipped diesel trucks.[25] The regulation established new engine and in-use truck requirements and emission performance requirements for technologies used as alternatives to idling the truck's main engine. For example, the regulation requires 2008 and newer model year heavy-duty diesel engines to be equipped with a non-programmable engine shutdown system that automatically shuts down the engine after five minutes of idling, or optionally meet a stringent NO_X emission standard. The regulation also requires operators of both in-state and out-of-state registered sleeper berth equipped trucks to manually shut down their engine when idling more than five minutes at any location within California. Emission producing alternative technologies such as diesel-fueled auxiliary power systems and fuel-fired heaters are also required to meet emission performance requirements that ensure emissions are not exceeding the emissions of a truck engine operating at idle.

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.[26] 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 CCR.

State Regulations Related to GHG Emissions

The statewide GHG emissions regulatory framework is summarized below. The following text describes EOs, legislation, regulations, and other plans and policies that would directly or indirectly reduce GHG emissions and/or address climate change issues. The following discussion does not include an exhaustive list of applicable regulations; rather, only the most prominent and applicable California legislation related to GHG emissions and climate change is included below.

State Climate Change Targets

California has taken a number of actions to address climate change, including EOs, legislation, and CARB plans and requirements, which are summarized below.

Executive Order S-3-05

EO S-3-05 (June 2005) established California's GHG emissions reduction targets and laid out responsibilities among the State agencies for implementing the EO and for reporting on progress toward the targets. The EO established the following targets:

[25] California Air Resources Board. *Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling*. October 24, 2013. Available at: https://ww2.arb.ca.gov/our-work/programs/atcm-to-limit-vehicle-idling. Accessed March 2024.

[26] 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 2024.

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

EO S-3-05 also directed CalEPA to report biannually on progress made toward meeting the GHG targets and the impacts to California due to global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry. The Climate Action Team was formed, which subsequently issues yearly GHG reduction report cards to track the progress of emission reduction strategies. Each report card documents the effectiveness of measures to reduce GHG in California, presents GHG emissions from State agencies' operations, and shows reductions that have occurred in the two years prior to publication.

Assembly Bill 32

In furtherance of the goals established in EO S-3-05, the Legislature enacted AB 32 (Núñez and Pavley). The bill is referred to as the California Global Warming Solutions Act of 2006 (September 27, 2006). AB 32 provided initial direction on creating a comprehensive, multi-year program to limit California's GHG emissions at 1990 levels by 2020 and initiate the transformations required to achieve the State's long-range climate objectives. AB 32 also required that the CARB prepare a "scoping plan" for achieving the maximum technologically feasible and cost-effective GHG emission reductions by 2020. The CARB's Scoping Plan is described in further detail below.

Executive Order B-30-15

EO B-30-15 (April 2015) identified an interim GHG reduction target in support of targets previously identified under EO S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing GHG emissions to 40 percent below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80 percent below 1990 levels by 2050 as set forth in EO S-3-05. To facilitate achieving this goal, EO B-30-15 called for an update to the CARB's Climate Change Scoping Plan: A Framework for Change (Scoping Plan) to express the 2030 target in terms of million metric tons (MMT) of CO_2e. The CARB's Scoping Plan is discussed in further detail below. The EO also called for State agencies to continue to develop and implement GHG emission reduction programs in support of the reduction targets.

Senate Bill 32 and Assembly Bill 197

Senate Bill (SB) 32 and AB 197 (enacted in 2016) are companion bills. SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40 percent below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, to provide ongoing oversight over implementation of the State's climate policies. AB 197 also added two members of the Legislature to the Board as non-voting members; requires CARB to make available and update (at least annually via the CARB's website) emissions data for GHGs, criteria air pollutants, and TACs from reporting facilities; and requires CARB to identify specific information for GHG emissions reduction measures when updating the Scoping Plan.

CARB's Climate Change Scoping Plan

One specific requirement of AB 32 is for CARB to prepare a scoping plan for achieving the maximum technologically feasible and cost-effective GHG emission reductions by 2020 (Health and Safety Code Section 38561[a]), and to update the Scoping Plan at least once every five years.

In 2008, CARB approved the first Scoping Plan. The Scoping Plan included a mix of recommended strategies that combined direct regulations, market-based approaches, voluntary measures, policies, and other emission reduction programs calculated to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the State's long-range climate objectives. The key elements of the Scoping Plan include the following:

1. Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
2. Achieving a statewide renewable energy mix of 33 percent;
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85 percent of California's GHG emissions;
4. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
5. Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (LCFS) (17 CCR, Section 95480 et seq.); and
6. Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

The Scoping Plan also identified local governments as essential partners in achieving California's goals to reduce GHG emissions because they have broad influence and, in some cases, exclusive authority over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Specifically, the Scoping Plan encouraged local governments to adopt a reduction goal for municipal operations and for community emissions to reduce GHGs by approximately 15 percent from 2008 levels by 2020. Many local governments developed community-scale local GHG reduction plans based on this Scoping Plan recommendation.

In 2014, CARB approved the first update to the Scoping Plan. The First Update to the Climate Change Scoping Plan: Building on the Framework (First Update) defined the State's GHG emission reduction priorities for the next five years and laid the groundwork to start the transition to the post-2020 goals set forth in EO S-3-05 and EO B-16-2012. The First Update concluded that California is on track to meet the 2020 target but recommended a 2030 mid-term GHG reduction target be established to ensure a continuation of action to reduce emissions. The First Update recommended a mix of technologies in key economic sectors to reduce emissions through 2050, including energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies. As part of the First Update, CARB recalculated the State's 1990 emissions level using more recent GWPs identified by the IPCC, from 427 MMT CO_2e to 431 MMT CO_2e.

In 2015, as directed by EO B-30-15, CARB began working on an update to the Scoping Plan to incorporate the 2030 target of 40 percent below 1990 levels by 2030 to keep California on a trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80 percent below 1990 levels by 2050, as set forth in EO S-3-05. In summer 2016, the Legislature affirmed the importance of addressing climate change through passage of SB 32 (Pavley, Chapter 249, Statutes of 2016).

In December 2017, the Scoping Plan was once again updated. The 2017 Scoping Plan built upon the successful framework established in the initial Scoping Plan and First Update, while identifying new, technologically feasible and cost-effective strategies that would serve as the framework to achieve the 2030 GHG target as established by SB 32 and define the State's climate change priorities to 2030 and beyond. For local governments, the 2017 Scoping Plan replaced the initial Scoping Plan's 15 percent reduction goal with a recommendation to aim for a communitywide goal of no more than six $MTCO_2e$ per capita by 2030, and no more than two $MTCO_2e$ per capita by 2050, which are consistent with the State's long-term goals. The 2017 Scoping Plan recognized the benefits of local government GHG planning (e.g., through Climate Action Plans [CAPs]) and provided more information regarding tools to support those efforts. The 2017 Scoping Plan also recognized the CEQA streamlining provisions for project-level review where a legally adequate CAP exists.

When discussing project-level GHG emissions reduction actions and thresholds in the context of CEQA, the 2017 Scoping Plan stated that "achieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development" for project-level CEQA analysis, but also recognized that such a standard may not be appropriate or feasible for every development project. The 2017 Scoping Plan further provided that "the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA."

The most recent update to the Scoping Plan, the 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan Update) was adopted by the CARB in December 2022.[27] The 2022 Scoping Plan Update builds upon previous efforts to reduce GHG emissions and is designed to continue to shift the California economy away from dependence on fossil fuels. The 2022 Scoping Plan Update, the most comprehensive and far-reaching Scoping Plan developed to date, identifies a technologically feasible and cost-effective path to achieve carbon neutrality by 2045 while also assessing the progress California is making toward reducing its GHG emissions by at least 40 percent below 1990 levels by 2030, as called for in SB 32 and laid out in the 2017 Scoping Plan. The 2030 target is an interim but important stepping stone along the critical path to the broader goal of deep decarbonization by 2045. The relatively longer path assessed in the Scoping Plan incorporates, coordinates, and leverages many existing and ongoing efforts to reduce GHGs and air pollution, while identifying new clean technologies and energy. Given the focus on carbon neutrality, the Scoping Plan also includes discussion for the first time of the Natural and Working Lands (NWL) sectors as both sources of emissions and carbon sinks.

The 2022 Scoping Plan Update lays out a path to achieve targets for carbon neutrality and reduce GHG emissions by 85 percent below 1990 levels by 2045, as directed by AB 1279. The actions and outcomes in the plan will achieve significant reductions in fossil fuel combustion by deploying clean technologies and fuels, further reductions in short-lived climate pollutants, support for sustainable development, increased action on NWL to reduce emissions and sequester carbon, and the capture and storage of carbon.

CARB's Regulations for the Mandatory Reporting of GHG Emissions

CARB's Regulation for the Mandatory Reporting of GHG Emissions (17 CCR 95100–95157) incorporated by reference certain requirements that the USEPA promulgated in its Final Rule on

[27] California Air Resources Board. *2022 Scoping Plan for Achieving Carbon Neutrality*. November 16, 2022.

Mandatory Reporting of GHGs (40 Code of Federal Regulations [CFR] Part 98). In general, entities subject to the Mandatory Reporting Regulation that emit more than 10,000 $MTCO_2e$ per year are required to report annual GHGs through the California Electronic GHG Reporting Tool. Certain sectors, such as refineries and cement plants, are required to report regardless of emission levels. Entities that emit more than the 25,000 $MTCO_2e$ per year threshold are required to have their GHG emission report verified by a CARB-accredited third party.

Senate Bill 1383

SB 1383 establishes specific targets for the reduction of short-lived climate pollutants (SLCPs) (40 percent below 2013 levels by 2030 for CH_4 and HFCs, and 50 percent below 2013 levels by 2030 for anthropogenic black carbon), and provides direction for reductions from dairy and livestock operations and landfills. Accordingly, CARB adopted its SLCP Reduction Strategy in March 2017. The SLCP Reduction Strategy establishes a framework for the statewide reduction of emissions of black carbon, CH_4, and fluorinated gases.

Executive Order B-55-18/Assembly Bill 1279

EO B-55-18 (September 2018) establishes a statewide policy for California to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net-negative emissions thereafter. The goal is an addition to the existing statewide targets of reducing the State's GHG emissions. CARB intends to work with relevant State agencies to ensure that future scoping plan updates identify and recommend measures to achieve the carbon neutrality goal. On September 16, 2022, AB 1279, also known as the California Climate Crisis Act, codified the carbon neutrality goal established by EO B-55-18.

Mobile Sources

The following regulations relate to the control of GHG emissions from mobile sources. Mobile sources include both on-road vehicles and off-road equipment.

Assembly Bill 1493

AB 1493 (Pavley) (July 2002) was enacted in response to the transportation sector accounting for more than half of California's CO_2 emissions. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the State board to be vehicles that are primarily used for non-commercial personal transportation in the State. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. When fully phased in, the near-term (2009–2012) standards would result in a reduction of approximately 22 percent of GHG emissions compared to the emissions from the 2002 fleet, and the mid-term (2013–2016) standards would result in a reduction of approximately 30 percent.

Senate Bill 375

SB 375 (Steinberg) (September 2008) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 requires CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035, and to update those targets every eight years. SB 375 requires the State's 18 regional metropolitan planning organizations to prepare a sustainable communities strategy as part of their Regional Transportation Plans that will achieve the GHG reduction targets set by CARB. If a metropolitan planning organization is unable to devise a sustainable communities strategy to achieve the GHG reduction target, the metropolitan planning organization must prepare an alternative planning strategy demonstrating how the GHG reduction target would be achieved

through alternative development patterns, infrastructure, or additional transportation measures or policies.

Pursuant to California Government Code Section 65080(b)(2)(K), a sustainable communities strategy does not (1) regulate the use of land, (2) supersede the land use authority of cities and counties, or (3) require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with the sustainable community strategy. Nonetheless, SB 375 makes regional and local planning agencies responsible for developing those strategies as part of the federally required metropolitan transportation planning process and the State-mandated housing element process.

Advanced Clean Cars Program and Zero-Emissions Vehicle Program

The Advanced Clean Cars program (January 2012) is an emissions-control program for model years 2015 through 2025. The program combines the control of smog- and soot-causing pollutants and GHG emissions into a single coordinated package. The package includes elements to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean cars. To improve air quality, CARB has implemented new emission standards to reduce smog-forming emissions beginning with 2015 model year vehicles. By 2025, implementation of the rule is anticipated to reduce emissions of smog-forming pollution from cars by 75 percent compared to the average new car sold in 2015. To reduce GHG emissions, CARB, in conjunction with the USEPA and NHTSA, adopted GHG standards for model year 2017 to 2025 vehicles; the standards were estimated to reduce GHG emissions by 34 percent by 2025. The zero-emissions vehicle program acts as the focused technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of zero-emissions vehicles and plug-in hybrid electric vehicles in the 2018 to 2025 model years.

Executive Order B-16-12

EO B-16-12 (March 2012) required that State entities under the governor's direction and control support and facilitate the rapid commercialization of zero-emissions vehicles. The order directed CARB, California Energy Commission (CEC), California Public Utilities Commission (CPUC), and other relevant agencies to work with the Plug-In Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to help achieve goals by 2015, 2020, and 2025. On a statewide basis, EO B-16-12 established a target reduction of GHG emissions from the transportation sector equaling 80 percent less than 1990 levels by 2050. EO B-16-12 did not apply to vehicles that have special performance requirements necessary for the protection of the public safety and welfare.

Assembly Bill 1236

AB 1236 (October 2015) (Chiu) required a city, county, or city and county to approve an application for the installation of electric-vehicle charging stations, as defined, through the issuance of specified permits unless the city or county makes specified written findings based on substantial evidence in the record that the proposed installation would have a specific, adverse impact upon the public health or safety, and a feasible method to satisfactorily mitigate or avoid the specific, adverse impact does not exist. The bill provided for appeal of that decision to the planning commission, as specified. AB 1236 required electric-vehicle charging stations to meet specified standards. The bill required a city, county, or city and county with a population of 200,000 or more residents to adopt an ordinance, by September 30, 2016, that created an expedited and streamlined permitting process for electric-vehicle charging stations. The bill also required a city,

county, or city and county with a population of less than 200,000 residents to adopt the ordinance by September 30, 2017.

Water

The following regulations relate to the conservation of water, which reduces GHG emissions related to electricity demands from the treatment and transportation of water.

Executive Order B-29-15

In response to a drought in California, EO B-29-15 (April 2015) set a goal of achieving a statewide reduction in potable urban water usage of 25 percent relative to water use in 2013. The term of the EO extended through February 28, 2016, although many of the directives subsequently became permanent water-efficiency standards and requirements. The EO includes specific directives that set strict limits on water usage in the State. In response to EO B-29-15, the California DWR modified and adopted a revised version of the Model Water Efficient Landscape Ordinance (MWELO) that, among other changes, significantly increases the requirements for landscape water use efficiency, and broadens the applicability of the ordinance to include new development projects with smaller landscape areas.

Solid Waste

The following regulations relate to the generation of solid waste and means to reduce GHG emissions from solid waste produced within the State.

Assembly Bill 939 and Assembly Bill 341

In 1989, AB 939, known as the Integrated Waste Management Act (California Public Resources Code [PRC] Sections 40000 et seq.), was passed because of the observed increase in waste stream and the decrease in landfill capacity.

AB 341 (Chapter 476, Statutes of 2011 [Chesbro]) amended the California Integrated Waste Management Act of 1989 to include a provision declaring that the policy goal of the State is that not less than 75 percent of solid waste generated be source-reduced, recycled, or composted by 2020, and annually thereafter. In addition, AB 341 required the California Department of Resources Recycling and Recovery to develop strategies to achieve the State's policy goal.

Other State Actions

The following State regulations are broadly related to GHG emissions.

Senate Bill 97

SB 97 (Dutton) (August 2007) directed the Governor's Office of Planning and Research (OPR) (currently known as the Office of Land Use and Climate Innovation [LCI]) to develop guidelines under CEQA for the mitigation of GHG emissions. In 2008, the Governor's OPR issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents. The advisory indicated that the lead agency should identify and estimate a project's GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities. The advisory further recommended that the lead agency determine the significance of the impacts and impose all mitigation measures necessary to reduce GHG emissions to a level that is less than significant. The California Natural Resource Agency (CNRA) adopted the CEQA Guidelines amendments in December 2009, and the amended CEQA Guidelines became effective in March 2010.

Under the amended CEQA Guidelines, a lead agency has the discretion to determine whether to use a quantitative or qualitative analysis, or apply performance standards to determine the significance of GHG emissions resulting from a particular project (14 CCR 15064.4[a]). The CEQA Guidelines require a lead agency to consider the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4[b]). The CEQA Guidelines also allow a lead agency to consider feasible means of mitigating the significant effects of GHG emissions, including reductions in emissions through the implementation of project features or off-site measures. The adopted amendments do not establish a GHG emission threshold, instead allowing a lead agency to develop, adopt, and apply the lead agency's own thresholds of significance or those developed by other agencies or experts. CNRA acknowledges that a lead agency may consider compliance with regulations or requirements implementing AB 32 in determining the significance of a project's GHG emissions.

With respect to GHG emissions, the CEQA Guidelines state that lead agencies should "make a good faith effort, to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions (14 CCR 15064.4[a]). The CEQA Guidelines note that an agency may identify emissions by either selecting a "model or methodology" to quantify the emissions or by relying on "qualitative analysis or other performance based standards" (14 CCR 15064.4[a]). Section 15064.4(b) states that the lead agency should consider the following when assessing the significance of impacts from GHG emissions on the environment: (1) the extent to which a project may increase or reduce GHG emissions as compared to the existing environmental setting; (2) whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and (3) the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4[b]).

Executive Order S-13-08

EO S-13-08 (November 2008) is intended to hasten California's response to the impacts of global climate change, particularly sea-level rise. Therefore, the EO directs State agencies to take specified actions to assess and plan for such impacts. The final 2009 California Climate Adaptation Strategy report was issued in December 2009, and an update, Safeguarding California: Reducing Climate Risk, followed in July 2014. To assess the State's vulnerability, the report summarizes key climate change impacts to the State for the following areas: agriculture, biodiversity and habitat, emergency management, energy, forestry, ocean and coastal ecosystems and resources, public health, transportation, and water. Issuance of the Safeguarding California: Implementation Action Plans followed in March 2016. In January 2018, the CNRA released the Safeguarding California Plan: 2018 Update, which communicates current and needed actions that the State government should take to build climate change resiliency.

State Regulations Related to Energy

The primary State regulatory agencies governing energy consumption are the CEC and the CPUC.

The CEC, created by the Legislature in 1974, has seven major responsibilities: forecasting future energy needs; promoting energy efficiency and conservation by setting the State's appliance and building energy efficiency standards; supporting energy research that advances energy science and technology through research, development, and demonstration projects; developing renewable energy resources; advancing alternative and renewable transportation fuels and

technologies; certifying thermal power plants 50-MW and larger; and planning for and directing State response to energy emergencies.[28]

The CPUC regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. The CPUC is responsible for ensuring that customers have safe, reliable utility service and infrastructure at reasonable rates, regulating utility services, stimulating innovation, and promoting competitive markets.[29]

The State has adopted various regulations aimed at reducing energy consumption, increasing energy efficiency, and mandating sourcing requirements for electricity production. The following regulations are applicable to the Proposed Project and BRPA.

Building Energy

The following regulations relate to energy efficiency and energy use reductions in the built environment.

Title 24, Part 6

Title 24 of the CCR, which is known as the California Building Standards Code (CBSC), was established in 1978 and serves to enhance and regulate California's building standards. While not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically established Building Energy Efficiency Standards that are designed to ensure new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed periodically, and revised if necessary, by the Building Standards Commission and CEC (PRC Section 25402[b][1]). The regulations receive input from members of industry, as well as the public, with the goal of "reducing of wasteful, uneconomic, inefficient, or unnecessary consumption of energy" (PRC Section 25402). The regulations are scrutinized and analyzed for technological and economic feasibility (PRC Section 25402[d]) and cost effectiveness (PRC Sections 25402[b][2] and [b][3]). As a result, the standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment.

The 2022 Title 24 standards are the currently applicable building energy efficiency standards and became effective on January 1, 2023. Compliance with the 2022 Title 24 Building Energy Efficiency Standards will reduce energy use and associated GHG emissions compared to structures built in compliance with the previous 2019 Title 24 standards.

Title 24, Part 11

In addition to the CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11 of Title 24) is commonly referred to as CALGreen, and establishes minimum mandatory standards and voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The CALGreen standards took effect in January 2011 and instituted mandatory minimum environmental performance standards for all

[28] California Energy Commission. *About the California Energy Commission*. Available at: http://www.energy.ca.gov/about. Accessed March 2024.
[29] California Public Utilities Commission. *California Public Utilities Commission*. Available at: https://www.cpuc.ca.gov/about-cpuc. Accessed March 2024.

ground-up, new construction of commercial, low-rise residential and State-owned buildings and schools and hospitals. The original CALGreen standards have been updated several times. The CALGreen 2022 standards, which are the current standards, improved upon the 2019 CALGreen standards, and went into effect on January 1, 2023. The 2022 CALGreen Code focuses on four key areas in newly constructed homes and businesses:[30]

- Encouraging electric heat pump technology for space and water heating, which consumes less energy and produces fewer emissions than gas-powered units.
- Establishing electric-ready requirements for single-family homes to position owners to use cleaner electric heating, cooking and electric vehicle (EV) charging options whenever they choose to adopt those technologies.
- Expanding solar PV system and battery storage standards to make clean energy available onsite and complement the state's progress toward a 100 percent clean electricity grid.
- Strengthening ventilation standards to improve indoor air quality.

The CALGreen standards also include voluntary efficiency measures that are provided at two tiers and implemented at the discretion of local agencies and applicants. According to Section A4.602 of Appendix A4 of the CALGreen Code, CALGreen's Tier 1 standards call for a 15 percent improvement in energy requirements, stricter water conservation, 65 percent diversion of construction and demolition waste, 10 percent recycled content in building materials, 20 percent permeable paving, 20 percent cement reduction, and cool/solar-reflective roofs. CALGreen's more rigorous Tier 2 standards call for a 30 percent improvement in energy requirements, stricter water conservation, 80 percent diversion of construction and demolition waste, 15 percent recycled content in building materials, 30 percent permeable paving, 25 percent cement reduction, and cool/solar-reflective roofs.

Title 20

Title 20 of the CCR requires manufacturers of appliances to meet State and federal standards for energy and water efficiency. The CEC certifies an appliance based on a manufacturer's demonstration that the appliance meets the standards. New appliances regulated under Title 20 include refrigerators, refrigerator-freezers, and freezers; room air conditioners and room air-conditioning heat pumps; central air conditioners; spot air conditioners; vented gas space heaters; gas pool heaters; plumbing fittings and plumbing fixtures; fluorescent lamp ballasts; lamps; emergency lighting; traffic signal modules; dishwaters; clothes washers and dryers; cooking products; electric motors; low-voltage dry-type distribution transformers; power supplies; televisions and consumer audio and video equipment; and battery charger systems. Title 20 presents protocols for testing each type of appliance covered under the regulations, and appliances must meet the standards for energy performance, energy design, water performance, and water design. Title 20 contains three types of standards for appliances: federal and State standards for federally regulated appliances, State standards for federally regulated appliances, and State standards for non-federally regulated appliances.

Senate Bill 1

SB 1 (Murray) (August 2006) established a $3 billion rebate program to support the goal of the State to install rooftop solar energy systems with a generation capacity of 3,000 MW through

[30] California Energy Commission. *Energy Commission Adopts Updated Building Standards to Improve Efficiency, Reduce Emissions From Homes and Businesses.* Available at: https://www.energy.ca.gov/news/2021-08/energy-commission-adopts-updated-building-standards-improve-efficiency-reduce-0. Accessed March 2024.

2016. SB 1 added sections to the PRC, including Chapter 8.8 (California Solar Initiative), that require building projects applying for ratepayer-funded incentives for PV systems to meet minimum energy efficiency levels and performance requirements. Section 25780 established that it is a goal of the State to establish a self-sufficient solar industry. The goals included establishing solar energy systems as a viable mainstream option for homes and businesses within 10 years of adoption, and placing solar energy systems on 50 percent of new homes within 13 years of adoption. SB 1, also termed "Go Solar California," was previously titled "Million Solar Roofs."

Assembly Bill 1109

Enacted in 2007, AB 1109 required the CEC to adopt minimum energy efficiency standards for general-purpose lighting to reduce electricity consumption by 50 percent for indoor residential lighting and by 25 percent for indoor commercial lighting.

Climate Change Scoping Plan

Expanding and strengthening existing energy efficiency programs as well as building and appliance standards is the key element of the Scoping Plan, as introduced above, related to building energy.

Transportation/Fuel Energy

The following regulations relate to fuel efficiency and energy use reductions in the transportation and motorized vehicle sector.

Assembly Bill 1493

In 2002 California adopted AB 1493, also known as the Pavley I standards, which required new passenger vehicles with model years 2009 to 2016 to meet more stringent fuel efficiency standards. Additional laws have extended these rules to cover vehicles from future model years.

Executive Order S-1-07

EO S-1-07, otherwise known as the LCFS, was adopted in 2009 and requires transportation fuels such as gasoline and diesel sold within the state to be less carbon intensive. These policies reduce emissions from on-road transportation and off-road equipment use in the City of Davis.

Executive Order B-16-12

EO B-16-12 (March 2012) required that State entities under the governor's direction and control support and facilitate the rapid commercialization of zero-emissions vehicles. The order directed CARB, CEC, CPUC, and other relevant agencies to work with the Plug-In Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to help achieve goals by 2015, 2020, and 2025. On a statewide basis, EO B-16-12 established a target reduction of GHG emissions from the transportation sector equaling 80 percent less than 1990 levels by 2050. EO B-16-12 did not apply to vehicles that have special performance requirements necessary for the protection of the public safety and welfare.

Assembly Bill 1346

AB 1346 (October 2021) prohibits non-electric small off-road engines. Small off-road engines, which are used primarily in lawn and garden equipment, emit high levels of air pollutants and, in 2020, California daily criteria pollutant emissions from small off-road engines were higher than emissions from light-duty passenger cars. Thus, by January 1, 2024, regulations shall prohibit the engine exhaust and evaporative emissions from the sale of new small off-road engines.

Senate Bill 500

SB 500 (September 2021) requires that, beginning January 1, 2030, to the extent allowed by federal law, any autonomous vehicle that is model year 2031 or later, has a gross vehicle weight rating of less than 8,501 pounds, and is equipped with Level 3, 4, or 5 automation (as defined by the International Society of Automotive Engineers) to be a zero-emission vehicle to be operated on California public roads.

Climate Change Scoping Plan

The key elements of the Scoping Plan, as introduced above, related to transportation energy include the following:

1. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets; and
2. Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the LCFS (17 CCR, Section 95480 et seq.).

Renewable Energy and Energy Procurement

The following regulation relates to the source of electricity provided to consumers within the State, as well as standards related to the generation of electricity within the State.

Renewable Portfolio Standard (RPS), Senate Bill 350, and Senate Bill 100

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

Since the inception of the RPS program, the program has been extended and enhanced multiple times. In 2015, SB 350 extended the State's RPS program by requiring that publicly owned utilities procure 50 percent of their electricity from renewable energy sources by 2030. The requirements of SB 350 were expanded and intensified in 2018 through the adoption of SB 100, which mandated that all electricity generated within the State by publicly owned utilities be generated through carbon-free sources by 2045. In addition, SB 100 increased the previous renewable energy requirement for the year 2030 by 10 percent; thus, requiring that 60 percent of electricity generated by publicly owned utilities originate from renewable sources by the year 2030.

Local Regulations

The most prominent local regulations related to air quality, GHG emissions, and energy are established by the YSAQMD and the City of Davis, as discussed in further detail below.

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, 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 emissions reducing incentive programs.

YSAQMD CEQA Guidance

Nearly all development and mining 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.[31] The YSAQMD's handbook includes screening methodology and recommended thresholds of significance, including mass emission thresholds for construction-related and operational criteria pollutants. Although the YSAQMD's handbook includes emissions thresholds and analysis methodology for criteria pollutants, the YSAQMD has not yet established or adopted methodology or thresholds for the assessment of impacts related to GHG emissions.

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). Considering the relevance of Rule 2.5 and Rule 2.11 to the proposed activities, both rules are discussed in further depth below.

Rule 2.5 – Nuisance

Rule 2.5 prohibits the discharge of sufficient quantities of air contaminants or other materials that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public. The rule further protects the public from being subject to air contaminants and other materials that could endanger the comfort, repose, health, or safety of any persons, or could damage business or property.

Rule 2.11 – Particulate Matter Concentration

Rule 2.11 is intended to protect the ambient air quality within the YSAQMD's jurisdiction by establishing a standard for PM emissions. Per the definitions of Rule 2.11, PM is defined as any material that is emitted as a liquid or solid particles, or gaseous materials that becomes liquid or solid particles when collected at standard conditions. PM meeting the foregoing definition, shall not be released from any single source operation, dust,

[31] Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts*. July 11, 2007.

fumes, or other total suspended particulate matter emissions in excess of 0.1 grain per cubic foot of gas at dry standard conditions.

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

As a part of the SVAB federal ozone nonattainment area, the YSAQMD works with the other local air districts within the Sacramento area to develop a regional air quality management plan under the FCAA requirement. The currently applicable regional air quality management plan is called the SIP which describes and demonstrates how the Sacramento nonattainment area (in which the project site is located) would attain the required NAAQS by the proposed attainment deadline. In accordance with the requirements of the FCAA, the YSAQMD, along with the other air districts in the region, prepared the *Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan* (Ozone Attainment Plan) in December 2008. The CARB determined that the Ozone Attainment Plan met FCAA requirements and approved the Plan on March 26, 2009 as a revision to the SIP. An update to the plan, *2017 Revisions to the Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan* (2017 Ozone Attainment Plan), was prepared and adopted by CARB on November 16, 2017. An additional update to the plan was prepared and adopted by CARB on October 15, 2018, and known as the *2018 Updates to the California State Implementation Plan.*

The Ozone Attainment Plan, and subsequent updates, demonstrate how existing and new control strategies would provide the necessary future emission reductions to meet the FCAA requirements, including the NAAQS. It should be noted that in addition to strengthening the 8-hour ozone NAAQS, the USEPA also strengthened the secondary 8-hour ozone NAAQS, making the secondary standard identical to the primary standard. The SVAB remains classified as a severe nonattainment area for ozone with an attainment deadline of 2027. On October 26, 2015, the USEPA released a final implementation rule for the revised NAAQS for ozone to address the requirements for reasonable further progress, modeling and attainment demonstrations, and reasonably available control measures (RACM) and reasonably available control technology (RACT). The USEPA published designations for areas in attainment/unclassifiable for the 2015 ozone standards. The USEPA identified the entire Yolo County as nonattainment for the 2015 ozone standards.[32]

City of Davis

In addition to the City's General Plan goals and policies, the City of Davis has various strategies for reducing the City's air quality and GHG emissions, and energy demand. In 1999, Davis joined a small group of cities calling for local action and a national policy on climate change. In 2006, the City joined the U.S. Conference of Mayors Climate Protection Agreement that called for local and national action to reduce GHG emissions. In a follow-up action in spring 2007, the Davis City

[32] U.S. Environmental Protection Agency. *California Final Area Designations for the 2015 Ozone National Ambient Air Quality Standards Technical Support Document.* June 3, 2018.

Council unanimously adopted a strategy to reduce the City's GHG emissions. Based on the City Council action, the City joined the *Cities for Climate Protection* (CCP) program along with hundreds of other communities across the globe to reduce GHG emissions at the local level. The program is designed to educate and empower local governments to take action on climate change. The CCP is a performance-oriented campaign that offers a framework for local governments to reduce GHG emissions and improve livability within their municipalities. As part of this effort, the City of Davis has undertaken various actions to reduce GHG emissions within the City of Davis, including the adoption of the City's CAAP, as well as adoption of local GHG reduction targets, carbon budgets, and carbon allowances for residential land uses.

On March 5, 2019, the Davis City Council adopted a resolution declaring a climate emergency, which proposed a regional mobilization effort to reduce the effects of climate change. As part of the regional mobilization effort, the resolution accelerated the City's previously stated goal of achieving carbon neutrality by the year 2050 to a new carbon neutrality target date of 2040.

The most prominent regulations related to air quality, GHG emissions, and energy established by the City of Davis are discussed in further detail below.

City of Davis General Plan

The City's General Plan includes the following applicable goals, performance objectives, and policies related to air quality, GHG emissions, and energy.

Air Quality Chapter

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

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

Transportation Element

Goal #2 The Davis transportation system will evolve to improve air quality, reduce carbon emissions, and improve public health by encouraging usage of clean, energy-efficient, active (i.e. human powered), and economically sustainable means of travel.

Performance Objective #2.1 Reduce carbon emissions from the transportation sector by 61 percent by 2035.

Performance Objective #2.2 Reduce vehicle miles traveled (VMT) 39 percent by 2035.

Policy TRANS 1.5 Strive for carbon-neutrality or better from the transportation component of new residential development.

Policy TRANS 1.6 Reduce carbon emissions from the transportation system in Davis by encouraging the use of non-motorized and low carbon transportation modes.

Policy TRANS 1.7	Promote the use of electric vehicles and other low-polluting vehicles, including Neighborhood Electric Vehicles (NEV).
Policy TRANS 1.8	Develop and maintain a work trip-reduction program designed to reduce carbon emissions, criteria pollutants, and local traffic congestion.
Policy TRANS 3.3	Require new development to be designed to maximize transit potential.
Policy TRANS 4.4	Provide pedestrian and bicycle amenities.
Policy TRANS 4.5	Establish and implement bicycle parking standards for new developments and significant redevelopment.

Energy Chapter

Goal ENERGY 1. Reduce per capita energy consumption in Davis.

Policy ENERGY 1.3	Promote the development and use of advanced energy technology and building materials in Davis.
Policy ENERGY 1.5	Encourage the development of energy-efficient subdivisions and buildings.

Davis Climate Action and Adaptation Plan

The City of Davis adopted the Davis 2020-2040 CAAP in April 2023.[33] The CAAP is designed to place the community on a path to achieve carbon neutrality by 2040.

The CAAP includes measurable GHG emissions reduction and climate change adaptation actions that align with the City's net neutrality goals. When implemented, the actions are anticipated to reduce GHG emissions by 37 percent below 2016 levels by 2030 and set the community on a trajectory toward the 2040 carbon neutrality goal. The CAAP actions are intended to prepare the community for climate change impacts, improve public safety, address environmental justice, and enhance the quality of life for residents. Each action achieves a plan goal, organized by sector, as follows: (1) Building Energy and Design; (2) Transportation and Land Use; (3) Water Conservation and Waste Reduction; (4) Climate Adaptation; and (5) Carbon Removal. The CAAP also aims to reduce energy demand by making buildings more efficient, and expanding local renewable energy development and storage.

The Davis CAAP serves as a Qualified GHG Reduction Strategy under Section 15183.5 of the CEQA Guidelines, simplifying development review for new projects that are consistent with the CAAP.

[33] City of Davis. *Climate Action and Adaptation Plan*. April 18, 2023.

City of Davis Municipal Code

The following City of Davis Municipal Code sections would be applicable to the Proposed Project/BRPA.

Section 8.01.060

Section 8.01.060 of the Davis Municipal Code includes updated requirements related to energy efficient water heating systems and undergrounding of all electrical and communication service laterals to any new building or structures.

Section 8.01.090

Section 8.01.090 of the Municipal Code requires mandatory compliance with Tier 1 standards of the CALGreen Code, which would otherwise be voluntary under the CBSC. According to Section A4.602 of Appendix A4 of the CALGreen Code, CALGreen's voluntary Tier 1 standards call for a 15 percent improvement in energy requirements, stricter water conservation, 65 percent diversion of construction and demolition waste, 10 percent recycled content in building materials, 20 percent permeable paving, 20 percent cement reduction, and cool/solar-reflective roofs.

Section 8.01.100

In addition to all requirements of the California Energy Code applicable to new single-family dwellings and new low-rise multi-family dwellings,[34] Section 8.01.100 of the City of Davis Municipal Code requires that all mixed-fuel dwellings[35] comply with the following:

a) **New single-family dwellings.** New mixed-fuel, single-family dwellings shall be required to meet a Total Energy Design Rating (EDR) margin of 9.5 as defined by the 2022 California Energy Code. In addition, the electrical system design shall provide capacity for a future retrofit to facilitate the installation of all electric appliances. This includes capacity and space at the electrical service panel, prewiring and installed circuit breakers for the following appliances:
    1) Heat-pump water heater;
    2) Induction stove top and oven;
    3) Electric clothes dryer; and
    4) Heat-pump for code-required comfort heating.

b) **New low-rise multi-family dwellings.** New mixed-fuel, low-rise multi-family dwellings shall be required to meet a Total Energy Design Rating (EDR) margin of 10 as defined by the 2022 California Energy Code. In addition, the electrical system design shall provide capacity for a future retrofit to facilitate the installation of all electric appliances. This includes capacity and space at the electrical service panel, pre-wiring and installed circuit breakers for the following appliances:
    1) Heat-pump water heater (if applicable);
    2) Induction stove top and oven;
    3) Electric clothes dryer (if applicable); and
    4) Heat-pump for code-required comfort heating.

[34] For the purposes of CALGreen, low-rise multi-family is defined as residential buildings that include three stories or less.

[35] A "mixed-fuel dwelling" is a dwelling that uses natural gas or propane as fuel for space heating, water heating (including pools and spas), cooking appliances, or clothes drying appliances or is plumbed for such equipment.

Section 8.01.110

In addition to all requirements of the CALGreen Code applicable to new non-residential and high-rise multi-family dwellings,[36] Section 8.01.110 of the City of Davis Municipal Code requires the following:

a) **New non-residential buildings.** New non-residential buildings shall comply with the Tier 1 (ten percent compliance margin) requirement for energy efficiency by employing energy efficiency measures. In addition, a PV system sized to offset a portion of the total building energy use based on TDV energy is required. The PV sizing shall be consistent with the methodology included in the cost effectiveness study provided by TRC. The PV sizing calculations were developed such that PV size would be the lessor of approximately eighty percent offset of the building's modeled annual electric load or fifteen DC watts per square feet of solar zone. The solar zone must have a total area of no less than fifteen percent of the total roof area in accordance with Section 9.3.1 of the 2016 Non-residential Compliance Manual.

b) **New high-rise multi-family dwellings.** New high-rise multi-family dwellings shall comply with the Tier 1 (ten percent compliance margin) requirement for energy efficiency by employing energy efficiency measures. In addition, a PV system sized to offset a portion of the total building energy use based on TDV energy is required. The PV sizing calculations were developed such that PV size would be the lessor of approximately eighty percent offset of the building's modeled annual electric load or fifteen DC watts per square feet of solar zone. The solar zone must have a total area of no less than fifteen percent of the total roof area in accordance with Section 9.3.1 of the 2016 Non-residential Compliance Manual.

c) New non-residential and high-rise multi-family buildings shall incorporate EV charging stations as determined by Tables 1 and 2 (see Table 4.3-6 and Table 4.3-7). Each EV charging station installed shall be credited toward the CALGreen Code requirement for charging spaces.

4.3.4 IMPACTS AND MITIGATION MEASURES

The standards of significance and methodology used to analyze and determine the potential impacts related to air quality, GHG emissions, and energy 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

Consistent with Appendix G of the CEQA Guidelines, a significant impact related to air quality, GHG emissions, or energy would occur if the Proposed Project/BRPA would result in any of the following:

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

[36] For the purposes of CALGreen, high-rise multi-family is defined as residential buildings that include four stories or greater.

Table 4.3-6
Non-residential EV Charging Station Standards

Non-Residential Land Use Category	Required Parking Spaces	EV Chargers	Land Use (from City Parking Code; City Code Section 40.25.090)
Retail	0-10	0	1. Automobile or machinery sales and service garages. 2. Banks, post offices, business and professional offices. 3. Furniture and appliance stores, household equipment or furniture repair shop. 4. Launderettes. 5. Restaurants, beer parlors, nightclubs, and cardrooms. 6. Retail stores, shops, etc. 7. Rooming and lodging houses. 8. Shopping center, neighborhood. 9. Shopping center, community. 10. Land uses where up to 50% of spaces serving employees.
	11-51	1	
	52-102	2	
	Every Additional 50	+1	
Non-Retail	0-10	0	1. Group care homes. 2. Hospitals. 3. Hotels and motor hotels, motels. 4. Manufacturing plants, research or testing laboratories and bottling plants. 5. Medical or dental clinics. 6. Rest home, sanatorium, convalescent home or hospital. 7. Wholesale establishments, warehouses. 8. Land uses where more than 50% of spaces serving employees.
	11-26	1	
	27-42	2	
	Every Additional 15	+1	
Destination	0-10	0	1. Bowling alleys. 2. Churches, schools, day care centers and nursery schools. 3. Dance halls and assembly halls without fixed seats, exhibition halls except assembly rooms in conjunction with auditorium. 4. Funeral home, mortuaries. 5. Sports arenas auditoriums, theaters, assembly halls.
	11-36	1	
	37-62	2	
	Every Additional 25	+1	

Notes:

(1) All other non-modified Tier 1 standards for nonresidential EV charging apply.
(2) All required charging is Level 2 with the exception of non-retail (workplace) charging which can be satisfied by fifty percent Level 1 chargers with fifty percent payment-ready Level 2 chargers due to longer dwell times. Note: calculations for total number of chargers shall be rounded up and rounding shall favor Level 2 chargers.
(3) The first two chargers placed at non-retail (workplace) locations must be payment-ready Level 2 with subsequent chargers optionally Level 1.
(4) Fifty percent of required non-retail (workplace) chargers to be installed prior to issuance of certificate of occupancy if approved prior to January 1, 2020. Remaining required chargers do not have to be installed at time of construction but must be pre-wired and have adequate electrical panel capacity for each future charger. After January 1, 2020, all required chargers must be fully installed.
(5) Chargers should be placed to serve multiple parking spaces – see design recommendations in Section 5 of the City of Davis EV Charging Plan.
(6) EV charging parking spaces shall be included in the required number of parking spaces per Article 40.25 of the City of Davis Zoning Ordinance. If space is available in a parking lot, additional EV charging spaces may be installed beyond the minimum number required subject to review and approval by the department of community development and sustainability.

(Continues on next page)

Table 4.3-6
Non-residential EV Charging Station Standards

Non-Residential Land Use Category	Required Parking Spaces	EV Chargers	Land Use (from City Parking Code; City Code Section 40.25.090)

(7) Conversion of existing parking spaces for EV charging purposes shall be reviewed and approved by the director of community development to assure a balance between full-size parking spaces, compact parking spaces and parking spaces for persons with disabilities.

Table 4.3-7
Residential EV Charging Station Standards

Development Type	Tier 1 Modifications	Notes
Single-Family (1-3 units)	1. Single-family residential development required to pre-install 8 gauge wiring plus reserve room in electrical panel necessary to support Level 2 electric vehicle charging.	1. Addresses key barrier for adding Level 2 home EV charger.
Muti-Family (4 or more units)	1. Multi-family residential development projects are required to provide: (1) Level 1 charging at 5% of all required parking spaces with a minimum of 2 parking spaces served; (2) Level 2 charging at 1% of all required parking spaces where more than 20 parking spaces are required with a minimum of 1 parking space served; (3) conduit adequate for Level 2 charging to serve or reasonably be extended in the future to 25% of all parking spaces; and (4) room in panel(s) and capacity to serve 20% of all parking spaces with Level 1 charging and 5% of all parking spaces with Level 2 charging. Notes: (1) properly located, a single charger can serve multiple parking spaces; (2) reasonable future extension of conduit would not include the removal or trenching of hardscaped surfaces or areas where mature trees would be expected to establish (e.g., pavement, tree wells, etc.).	2. Addresses key barrier for EV use in residential rental settings.

Notes:

(1) All other non-modified Tier 1 standards for residential EV charging apply.
(2) Chargers in multi-family residential settings should be placed to serve multiple parking spaces – see design recommendations in Section 5 of the City of Davis EV Charging Plan.
(3) Level 1 in the context above is defined as a 20A 120V circuit and Level 2 is defined as a 40A 208V/240V circuit.
(4) Level 1 is defined as a 120V hardwired EVSE not a household outlet.
(5) Monitoring equipment to properly charge tenants is encouraged at multi-family locations.

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment;
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs;
- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources; or
- Conflict with or obstruct a State or local plan for renewable energy or energy efficiency.

Pursuant to CEQA Guidelines Section 15064.4(b)(2), the lead agency is charged with determining a threshold of significance that is applicable to the project. For the analysis within this EIR, the

City has elected to use the YSAQMD's thresholds of significance, as well as the City of Davis adopted goal of net carbon neutrality by the year 2040, as set forth in the City's CAAP. The analysis in this EIR uses the thresholds for criteria pollutants, localized CO, TAC emissions, and GHG emissions, as discussed below.

Criteria Pollutant Emissions

The YSAQMD significance thresholds for emissions of ROG, NO_X, and PM_{10} are presented in Table 4.3-8 below and are expressed in maximum tons per year (tons/yr) for ROG and NO_X and maximum pounds per day (lbs/day) for PM_{10}. If the Proposed Project's emissions exceed the pollutant thresholds presented in Table 4.3-8, the project could have a significant effect on air quality, the attainment of federal and State AAQS, and could conflict with or obstruct implementation of the applicable air quality plan.

Table 4.3-8
YSAQMD Thresholds of Significance

Pollutant	Construction Threshold	Operational/Cumulative Threshold
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.

With regard to cumulative emissions of criteria air pollutants, according to the YSAQMD Handbook for Assessing and Mitigating Air Quality Impacts, any project that would individually have a significant air quality impact (i.e., exceed the project level thresholds presented in Table 4.3-8) would also be considered to have a significant cumulative impact.[37] As a result, the cumulative-level emissions thresholds established by YSAQMD are assumed to be identical to the project-level emissions thresholds presented in Table 4.3-8, above.

Ascertaining cancer risk, or similar measurements of health effects from air pollutants, is very difficult for regional pollutants such as the ozone precursors ROG and NO_X. This challenge was addressed in Sierra Club v. County of Fresno (2018) 6 Cal.5th 502, 510, 517-522. In that case, the California Supreme Court held generally that an EIR should "make a reasonable effort to substantively connect a project's air quality impacts to likely health consequences." A possible example of such a connection would be to calculate a project's "impact on the days of nonattainment per year." But the court recognized that there might be scientific limitations on an agency's ability to make the connection between air pollutant emissions and public health consequences in a credible fashion, given limitations in technical methodologies. Thus, the court acknowledged that another option for an agency preparing an EIR might be "to explain why it was not feasible to provide an analysis that connected the air quality effects to human health consequences."

Here, the YSAQMD is the primary agency responsible for ensuring the health and welfare of sensitive individuals to elevated concentrations of emissions in Yolo County. At present, the YSAQMD has not provided any methodology to assist local governments in reasonably and accurately assessing the specific connection between mass emissions of ozone precursors (e.g.,

[37] Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts*. July 11, 2007.

ROG and NO_X) and other pollutants of concern on a regional basis and any specific effects on public health or regional air quality concentrations that might result from such mass emissions.

Ozone concentrations, for instance, depend upon various complex factors, including the presence of sunlight and precursor pollutants, natural topography, nearby structures that cause building downwash, atmospheric stability, and wind patterns. Because of the complexities of predicting ground level ozone concentrations related to the NAAQS and CAAQS, it is not possible to link health risks to the magnitude of emissions exceeding the significance thresholds. To achieve the health-based standards established by the EPA, the air districts prepare air quality management plans that detail regional programs to attain the AAQS. However, if a project within the YSAQMD exceeds the regional significance thresholds, the project could contribute to an increase in health effects in the basin until the attainment standards are met in the SVAB.

Notably, during the litigation process that led to the California Supreme Court decision in Sierra Club v. County of Fresno, the San Joaquin Valley Air Pollution Control District (SJVAPCD) submitted an amicus curiae brief that provided scientific context and expert opinion regarding the feasibility of performing regional dispersion modeling for ozone. In the brief, SJVAPCD states that "CEQA does not require an EIR to correlate a project's air quality emissions to specific health impacts, because such an analysis is not reasonably feasible." As SJVAPCD explains:

> Attainment of a particular NAAQS occurs when the concentration of the relevant pollutant remains below a set threshold on a consistent basis throughout a particular region. For example, the San Joaquin Valley attained the 1-hour ozone NAAQS when ozone concentrations remained at or below 0.124 parts per million Valley-wide on 3 or fewer days over a 3-year period. Because the NAAQS are focused on achieving a particular concentration of pollution region-wide, the Air District's tools and plans for attaining the NAAQS are regional in nature.
>
> For instance, the computer models used to simulate and predict an attainment date for the ozone or particulate matter NAAQS in the San Joaquin Valley are based on regional inputs, such as regional inventories of precursor pollutants (NOx, SOx and VOCs) and the atmospheric chemistry and meteorology of the Valley. At a very basic level, the models simulate future ozone or PM levels based on predicted changes in precursor emissions Valley wide. Because the NAAQS are set levels necessary to protect human health, the closer a region is to attaining a particular NAAQS, the lower the human health impact is from that pollutant.
>
> The goal of these modeling exercises is not to determine whether the emissions generated by a particular factory or development project will affect the date that the Valley attains the NAAQS. Rather, the Air District's modeling and planning strategy is regional in nature and based on the extent to which all of the emission-generating sources in the Valley (current and future) must be controlled in order to reach attainment.
>
> Accordingly, the Air District has based its thresholds of significance for CEQA purposes on the levels that scientific and factual data demonstrate that the [SJVAB] can accommodate without affecting the attainment date for the NAAQS. The Air District has tied its CEQA significance thresholds to the level at which stationary pollution sources must "offset" their emissions…Thus, the CEQA air quality analysis for criteria air pollutants is not really a localized, project-level impact analysis but one of regional cumulative impacts.

The brief explains that these CEQA thresholds of significance are not intended to be applied such that any localized human health impact associated with a project's regional pollutant emissions could be identified. Rather, CEQA thresholds of significance are used to determine whether a

project's emissions would obstruct a region's capability of attaining the NAAQS and CAAQS according to the emissions inventory prepared in a SIP, which is then submitted and reviewed by CARB and EPA. This sentiment is corroborated in an additional brief submitted by the South Coast Air Quality Management District. Based on the expert analyses submitted by these leading air districts, the City has concluded that it is not scientifically feasible to predict in a meaningful manner how mass emissions of pollutants of regional concern (e.g., ozone precursors) from a project of the size of the Proposed Project/BRPA could lead to specific public health consequences, changes in pollutant concentrations, or changes in the number of days for which the SVAB will be in nonattainment for regional pollutants.

Localized CO Emissions

The YSAQMD recommends the use of screening thresholds to assess a project's potential to create an impact through the creation of CO hotspots. A violation of the CO standard could occur if either of the following criteria is true of any street or intersection affected by the mitigated project:[38]

- The project would reduce peak-hour level of service (LOS) on one or more streets or at one or more intersections to an unacceptable LOS (typically LOS E or F); or
- The project would increase a traffic delay by 10 or more seconds on one or more streets or at one or more intersections in the project vicinity where a peak hour LOS of F currently exists.

However, considering that the law has changed with respect to how transportation-related impacts may be addressed under CEQA such that unacceptable LOS is no longer considered a significant impact on the environment under CEQA, the analysis herein related to localized CO emissions uses guidance from the nearby Sacramento Metropolitan Air Quality Management District (SMAQMD) and Placer County Air Pollution Control District (PCAPCD). According to the SMAQMD's CEQA Guide,[39] emissions of CO are generally of less concern than other criteria pollutants, as operational activities are not likely to generate substantial quantities of CO, and the SVAB has been in attainment for CO for multiple years. Thus, SMAQMD no longer recommends an analysis of localized CO emissions. The PCAPCD, which has jurisdiction over a portion of the SVAB, has a screening level for localized CO impacts. According to the PCAPCD screening level, a project could result in a significant impact if the project would result in CO emissions from vehicle operations in excess of 550 lbs/day.[40]

TAC Emissions

For TAC emissions, if a project would introduce a new source of TAC or a new sensitive receptor near an existing source of TAC that would not meet the CARB's minimum recommended setback, a detailed health risk assessment may be required. As such, in addition to the thresholds of significance presented above for criteria air pollutants, YSAQMD has also developed thresholds for potential exposure of the public to TACs from new stationary sources. Exposure of the public to TACs from new stationary sources in excess of the following thresholds would be considered a significant impact:

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38 Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts* [p. 21]. July 11, 2007.
39 Sacramento Metropolitan Air Quality Management District. *CEQA Guide*. April 2020.
40 Placer County Air Pollution Control District. *CEQA Air Quality Handbook*. November 21, 2017.

- Probability of contracting cancer for the Maximally Exposed Individual (MEI) equals 10 in one million or more; and
- Ground-level concentrations of non-carcinogenic TACs would result in a Hazard Index equal to 1.0 for the MEI or greater.

Although the YSAQMD has established thresholds for exposure to TACs from new stationary sources, a threshold for exposure of the public to mobile TAC emissions, such as emissions associated with DPM from heavy-duty diesel trucks or off-road construction equipment, does not currently exist. In the absence of a specified threshold for assessing impacts of mobile sources of TACs on a sensitive land use, the industry standard is to use the stationary source threshold of an increase in cancer risk of 10 in one million and a Hazard Index greater than one, which is the standard that has been used throughout the State for similar health risk analyses.

GHG Emissions

With respect to establishing significance thresholds for GHG emissions, CEQA Guidelines Section 15064.4 states:

> (a) The determination of the significance of GHG emissions calls for a careful judgment by the lead agency consistent with the provisions in Section 15064. A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of GHG emissions resulting from a project.
> (b) A lead agency should consider the following factors, among others, when assessing the significance of impacts from GHG emissions on the environment:
> (1) The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;
> (2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project;
> (3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of GHG emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

Thus, one threshold that is commonly used to analyze a project's GHG emissions is whether the project would conflict with or obstruct the goals, strategies, or governing regulation (Health & Safety Code, Section 38500-38599) of the California Global Warming Solutions Act of 2006 (AB 32) and the GHG reduction targets in SB 32.

The YSAQMD, in their Handbook for Assessing and Mitigating Air Quality Impacts, acknowledges that new emissions generated by development projects could potentially conflict with existing GHG emissions reductions targets, and, thus, a need for development of GHG emissions thresholds exists. However, the YSAQMD has not yet established or adopted any GHG emissions thresholds. The YSAQMD is currently recommending GHG analysis consistent with the SMAQMD adopted thresholds of significance. While SMAQMD recognizes that emissions from a single project cannot be determined to substantially impact overall GHG emissions levels in the atmosphere, an emissions threshold is useful to trigger further project review and assess mitigation. As such, SMAQMD has developed thresholds for project construction and operational

GHG emissions that allow for review of proposed projects to ensure consistency with the emissions-reduction goals of AB 32, SB 32, the Scoping Plan, and relevant executive orders. Although SMAQMD has developed thresholds for project CEQA review, SMAQMD further specified that where cities have adopted city-specific climate action plans or GHG reduction plans, proposed projects should be assessed in relation to those city-specific plans, rather than SMAQMD's thresholds. As discussed in further depth below, the City of Davis has adopted a CAAP, which is considered the relevant GHG reduction program for operational GHG emissions of existing and proposed developments within the City.

The 2020 Yolo County Regional GHG Emissions Inventory Update for the Cities of Davis, Winters and Woodland – Draft Technical Memorandum (2020 GHG Emissions Inventory), includes an estimation of citywide 2016 emissions levels, which were used as the basis for the City of Davis's citywide GHG reduction target thresholds.[41] The emissions reductions targets provide a desired rate of reduction, which are more ambitious than the State's most recent target set in EO B-55-18, and include achievement of citywide carbon neutrality by 2040.

The CAAP includes measurable GHG emissions reduction and climate change adaptation actions that align with the City's net neutrality goals. When implemented, the actions are anticipated to reduce GHG emissions within the City by 37 percent below 2016 levels by 2030 and set the community on a trajectory toward the 2040 carbon neutrality goal. As such, projects that were considered within the 2020 GHG Emissions Inventory can be addressed through the CAAP GHG emissions reduction and climate change adaptation actions.

The Proposed Project/BRPA would require a sphere of influence (SOI) amendment, annexation into the City of Davis, a General Plan amendment, and pre-zoning of the site. As such, the Proposed Project/BRPA was not considered within the 2020 GHG Emissions Inventory. In order to maintain the emissions reductions trajectory anticipated by the CAAP and mandated by the City's climate emergency declaration, the Proposed Project/BRPA would be required to demonstrate that operations would not exceed existing emissions levels associated with the project site/BRPA site. Should the Proposed Project/BRPA result in increased on-site emissions relative to existing levels, the project would be responsible for reducing post-project emissions to a level equal to the existing level of emissions. By ensuring that emissions from the Proposed Project/BRPA remain at or below existing levels, the project would provide a proportionate share of emissions reductions and would not inhibit attainment of citywide net carbon neutrality by the year 2040, nor would the project conflict with the City's CAAP.

A downward trajectory to carbon neutrality could be achieved through various means. For instance, design features could be incorporated into the project design to reduce operational emissions. Design features could include natural ventilation systems to reduce energy use or all electric appliances to reduce the consumption of natural gas on-site. The project applicant would be able to demonstrate the on-site emissions reductions achieved through design features, which would continue to reduce emissions throughout the lifespan of the project. Should project design features be insufficient to reduce emissions on-site, the project applicant would be required to show off-site reductions sufficient to meet reduction requirements for net carbon neutrality by 2040. Off-site measures could be implemented within the City of Davis, for instance through funding of tree-planting programs, or through the purchase of off-set credits through CARB or YSAQMD verified off-set programs. Furthermore, the project applicant could participate in any

[41] Yolo County Department of Community Services. *Yolo County Regional Greenhouse Gas Emissions Inventory Update for the Cities of Davis, Winters and Woodland – Draft Technical Memorandum*. April 30, 2020.

future off-set programs established by the City. Should project emissions be shown to achieve a downward trajectory from the anticipated emissions level to carbon neutrality (zero $MTCO_2e$/yr) by the year 2040, project operations would be considered in compliance with the City's adopted GHG emissions reduction goal and the City's CAAP.

Therefore, the Proposed Project/BRPA would be considered to conflict with the City's GHG reduction targets, if the project would result in net positive operational GHG emissions by the year 2040. Conformance with the City's goal of net carbon neutrality by 2040 would also demonstrate compliance with the City's CAAP and consistency with the statewide reduction targets of AB 32 and SB 32.

Although the City has adopted clear GHG reductions goals, which the City has elected to use as operational thresholds for the Proposed Project/BRPA in this EIR, the City has not specifically adopted goals or thresholds to analyze GHG emissions associated with construction of proposed projects. As discussed above, the YSAQMD is currently recommending GHG analysis consistent with the SMAQMD adopted thresholds of significance. For construction-related GHG emissions, the SMAQMD has adopted a threshold of significance of 1,100 $MTCO_2e$/yr. As such, if construction of the Proposed Project/BRPA would result in emissions that exceed 1,100 $MTCO_2e$/yr, then construction of the Proposed Project/BRPA could be considered to result in a potentially significant impact and mitigation measures would be required.

Energy

Quantitative thresholds for the analysis of potential impacts related to energy consumption have not been adopted by any local, regional, or statewide entities. Consequently, potential impacts of the project/BRPA related to energy will be determined based on whether the project/BRPA would result in wasteful, inefficient, or unnecessary use of energy. In addition, the potential for the project/BRPA to conflict with or obstruct a State or local plan for renewable energy generation or energy efficiency is considered. The analysis of energy consumption includes consideration of energy demand during both construction and operations of the Proposed Project/BRPA.

Method of Analysis

A comparison of project-related emissions (including emissions generated from the Proposed Project and the BRPA) to the thresholds discussed above shall determine the significance of the potential impacts to air quality and climate change resulting from the Proposed Project/BRPA. Emissions attributable to the Proposed Project/BRPA which exceed the significance thresholds could have a significant effect on regional air quality and the attainment of the federal and State AAQS, global climate change, and energy. Where potentially significant impacts are identified, mitigation measures are described that would reduce or eliminate the impact.

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 and the BRPA's air quality impacts, including screening criteria and pollutant thresholds of significance. Details regarding the methodology and assumptions used for the Proposed Project's and BRPA's air quality and GHG impact analysis are provided below.

Construction Emissions

The Proposed Project and the BRPA would both be built out over four phases across approximately seven years. As a result, modeling construction of the entire project area in one phase would not represent a realistic analysis. Thus, in order to provide a more realistic evaluation

of potential impacts, while also remaining conservative, the modeling conducted for construction of both the Proposed Project and the BRPA is for the most intensive construction phase, which would be Phase 1. The approximate boundaries of Phase 1 for the Proposed Project and the BRPA are shown in Figure 3-13 and Figure 3-23, included in Chapter 3, Project Description, of this EIR, respectively.

As discussed therein, Phase 1 of the Proposed Project is anticipated to include development of the following:

- West Park North (60 affordable, medium-density, multi-family residential units);
- West Park South (240 affordable, high-density, multi-family residential units);
- Central Village and Parkside Village East (470 medium-density homes consisting of starter single-family homes, townhomes, and cottages);
- East Village (220 market-rate low-density residential units);
- The Urban Agricultural Transition Area (UATA);
- Greenbelts along Pole Line Road, East Covell Boulevard, and the adjoining City-owned property to the north of the project site; and
- Internal greenbelts and trails.

Phase 1 of the BRPA is anticipated to include development of the following:

- West Park North and South (360 multi-family units, 270 of which would be affordable and 90 of which would be market-rate multi-family units);
- East Village (265 medium-density units consisting of single-family units and duplexes);
- Central Villages East and West (315 medium-density units consisting of single-family units and duplexes);
- Greenbelts along Pole Line Road, East Covell Boulevard, and the adjoining City-owned property to the north of the BRPA site;
- Internal greenbelts and trails; and
- The UATA.

It should also be noted that, as presented in the Public Services and Recreation chapter of this EIR, the City could condition the Proposed Project/BRPA to construct the proposed fire station during Phase 1 of the Proposed Project/BRPA. Therefore, to provide a conservative analysis, the Phase 1 construction modeling assumed construction of the proposed fire station.

In addition, Phase 1 of both the Proposed Project and the BRPA would include the installation of water, sewer, and storm drain infrastructure within existing and proposed roadways, as well as electrical and communication infrastructure. Phase 1 would also include the relocation and expansion of Channel A and the new detention basin.

Due to the size of the Phase 1 disturbance area, the backbone infrastructure proposed to be constructed as part of Phase 1, and certain level of development included in Phase 1, Phase 1 of the Proposed Project and the BRPA would represent the most emissions-intensive phase of construction. Notably, the entire project site/BRPA site would be mass graded as part of Phase 1, whereas all other phases of construction would result in a less intensive level of development as compared to Phase 1, as finished grading (i.e., setting building pads and street heights) would be done over smaller areas on top of the mass grading. Thus, the subsequent phases would be less emissions intensive as compared to Phase 1.

The Proposed Project's and BRPA's short-term construction emissions associated with buildout of Phase 1 were estimated using the CalEEMod version 2022.1.1.22 web-based software, which is 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 Institute of Transportation Engineers (ITE) Manual, vehicle mix (i.e., the proportion of diesel, gasoline, electric, natural gas, and plug-in hybrid vehicle types), trip length, average speed, etc. However, where project-specific data was available, such data was input into the model.

Accordingly, the Phase 1 construction modeling for both the Proposed Project and the BRPA assumed the following:

- Construction would commence in April of 2026 and would occur over an approximately four-year period;
- Approximately 11,261.3 cubic yards (CY) of material would be exported off-site during grading;
- The site preparation, grading, paving, and building construction phase timing was adjusted based on project-specific information provided by Cunningham Engineering;
- Based on typical construction practices, the architectural coating phase of construction was assumed to begin two weeks after the commencement of the building construction phase and occur over a similar number of days; and
- The number of anticipated pieces of construction equipment was increased during the grading phase to account for the amount of on-site material movement from the UATA to the proposed development area, which, according to Cunningham Engineering, is estimated to be approximately 1,000,000 CY.

Operational Emissions

Operational emissions associated with the Proposed Project and the BRPA were estimated using CalEEMod. Based on the construction information provided by the project engineer, the Proposed Project and the BRPA are both anticipated to be fully operational by 2033. The project-specific trip generation and VMT data provided by Fehr & Peers for full buildout of the Proposed Project and full buildout of the BRPA was applied to the project modeling.[42] In addition, the project applicant has committed to the prohibition of natural gas on-site. As such, the modeling assumes that the Proposed Project and the BRPA would be built all-electric. Given the program-level entitlements being sought at this time, the project engineer has not yet identified the extent of on-site roof-top solar that would be provided. On-site solar energy generation would be required in compliance with Title 24, through the provision of roof-top solar, and will be calculated prior to issuance of building permits in compliance with Mitigation Measure 4.3-8. For conservative purposes, the modeling in this EIR performed for the current set of program-level entitlements does not account for the provision of on-site solar energy systems.

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.

[42] Fehr & Peers. *Village Farms Davis Transportation Impact Study*. November 2024.

Project-Specific Impacts and Mitigation Measures

The following discussion of impacts is based on implementation of the Proposed Project/BRPA in comparison with the standards of significance identified above. GHG emissions are inherently cumulative; thus, the discussion of GHG impacts is included under the Cumulative Impacts and Mitigation Measures section below.

4.3-1 Conflict with or obstruct implementation of the applicable air quality plan during project construction. Based on the analysis below, the impact is *less than significant*.

During construction of the Proposed Project/BRPA, various types of equipment and vehicles would temporarily operate on the project/BRPA site. Construction-related emissions would be generated from demolition activity, 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/BRPA construction activities also represent sources of fugitive dust, which includes PM emissions. As construction of the Proposed Project/BRPA would generate emissions of criteria air pollutants, including ROG, NO_X, and PM_{10}, intermittently within the site and in the vicinity of the site, until all construction has been completed, construction is a potential concern, as the Proposed Project/BRPA is located in a nonattainment area for ozone and PM.

The following discussions include an analysis of the potential for the Proposed Project, as well as the BRPA, to conflict with or obstruct implementation of the applicable air quality plan during project construction.

Proposed Project

The maximum unmitigated construction emissions associated with Phase 1 of construction, which represents the most emissions-intensive phase of construction, have been estimated using CalEEMod for the Proposed Project and are presented in Table 4.3-9. The construction modeling assumptions are described in the Method of Analysis section above.

Table 4.3-9
Maximum Unmitigated Construction-Related Emissions – Proposed Project Phase 1

	ROG	NO_X	PM_{10}
Project Emissions	2.58 tons/yr	3.61 tons/yr	21.6 lbs/day
YSAQMD Threshold of Significance	*10.00 tons/yr*	*10.00 tons/yr*	*80.00 lbs/day*
Exceeds Threshold?	**NO**	**NO**	**NO**
Source: CalEEMod, November 2024 (see Appendix C).			

As shown in the table, the Proposed Project's maximum short-term construction-related emissions would be below the applicable YSAQMD thresholds of significance. Therefore, construction-related emissions resulting from implementation of the Proposed Project 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.

In addition, while all projects within the YSAQMD, including the Proposed Project, are 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), the Proposed Project was modeled without the inclusion of such rules and regulations to provide a conservative, worst-case emissions scenario. Even under the conservative assumptions used for this analysis, emissions of PM_{10} would remain below the YSAQMD's thresholds of significance.

According to YSAQMD Guidance, even projects not exceeding the YSAQMD construction-related PM thresholds should implement best management practices to reduce dust emissions and avoid localized health impacts. The YSAQMD's best management practices for dust include, but are not necessarily 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 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; and
- Treatment of accesses to distance of 100 feet from the paved road with a six- to 12-inch layer of wood chips, mulch, or gravel.

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

Biological Resources Preservation Alternative

Similar to the Proposed Project, the maximum unmitigated construction emissions associated with Phase 1 of construction for the BRPA have been estimated using CalEEMod and are presented in Table 4.3-10. The construction modeling assumptions are described in the Method of Analysis section above.

Table 4.3-10
Maximum Unmitigated Construction-Related Emissions – BRPA Phase 1

	ROG	NO_X	PM_{10}
Project Emissions	2.67 tons/yr	3.61 tons/yr	21.6 lbs/day
YSAQMD Threshold of Significance	*10.00 tons/yr*	*10.00 tons/yr*	*80.00 lbs/day*
Exceeds Threshold?	**NO**	**NO**	**NO**

Source: CalEEMod, November 2024 (see Appendix C).

As shown in the table, the BRPA's maximum short-term construction-related emissions would be below the applicable YSAQMD thresholds of significance. Therefore, construction-related emissions resulting from implementation of the BRPA 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.

Furthermore, as discussed above, all projects within the YSAQMD, are required to comply with all YSAQMD rules and regulations for construction. However, similar to the Proposed Project, the BRPA was modeled without the inclusion of such rules and regulations to provide a conservative, worst-case emissions scenario. Even under the conservative assumptions used for this analysis, emissions of PM_{10} would remain below the YSAQMD's thresholds of significance. In addition, as noted above, according to YSAQMD Guidance, even projects not exceeding the YSAQMD construction-related PM thresholds should implement best management practices to reduce dust emissions and avoid localized health impacts.

Similar to the Proposed Project, compliance with the aforementioned rules and regulations related to construction, as well as implementation of best management practices for dust, would help to minimize emissions generated during construction activities associated with the BRPA.

Conclusion

Because implementation of the Proposed Project and BRPA 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 and BRPA would result in a ***less-than-significant*** impact.

Mitigation Measure(s)

None required.

4.3-2 Conflict with or obstruct implementation of the applicable air quality plan during project operation. Based on the analysis below, even with implementation of mitigation, the impact is *significant and unavoidable*.

Due to the nonattainment designations of the area, the YSAQMD has developed plans to attain the State and federal standards for ozone and PM. The currently applicable air quality plan is the Ozone Attainment Plan. 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 the applicable air quality plan. Thus, if a project's operational emissions exceed the YSAQMD's mass emissions 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.

Emissions of ROG, NO_X, and PM_{10} would be generated during operations of the Proposed Project/BRPA from both mobile and stationary sources 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 most significant source of emissions related to the Proposed Project/BRPA would be from mobile sources. As discussed in the Method of Analysis section above, to capture the potential emissions related to mobile sources from the Proposed Project and BRPA, the project-specific trip generation rates and VMT estimates prepared by Fehr & Peers were applied to the project modeling.

The following discussions include an analysis of the potential for the Proposed Project, as well as the BRPA, to conflict with or obstruct implementation of the applicable air quality plan during project operation.

Proposed Project

The maximum unmitigated operational emissions for the Proposed Project have been estimated using CalEEMod and are presented in Table 4.3-11. The operational modeling assumptions are described in the Method of Analysis section above.

Table 4.3-11
Maximum Unmitigated Operational Emissions – Proposed Project

	ROG	NO_X	PM_{10}*
Project Emissions	22.6 tons/yr	8.6 tons/yr	88.4 lbs/day
YSAQMD Significance Threshold	*10.00 tons/yr*	*10.00 tons/yr*	*80.00 lbs/day*
Exceeds Threshold?	**YES**	**NO**	**YES**

* The CalEEMod modeling includes 88.396 lbs/day of mobile source PM_{10} emissions and 0.0528 lbs/day of area source emissions. Rounding within the CalEEMod report has resulted in slight differences in summation.

Source: CalEEMod, October 2024 (see Appendix C).

As shown in the table above, the Proposed Project's maximum unmitigated operational emissions of NO_X would be below the applicable YSAQMD threshold of significance. However, the Proposed Project's maximum unmitigated operational emissions of ROG and PM_{10} would exceed the applicable YSAQMD thresholds of significance. Accordingly, the Proposed Project could violate an air quality standard or contribute substantially to an existing or projected air quality violation.

Biological Resources Preservation Alternative

Similar to the Proposed Project, the maximum unmitigated operational emissions for the BRPA have been estimated using CalEEMod and are presented in Table 4.3-12. The operational modeling assumptions are described in the Method of Analysis section above.

As shown in the table above, the BRPA's maximum unmitigated operational emissions of NO_X would be below the applicable YSAQMD threshold of significance. However, the BRPA's maximum unmitigated operational emissions of ROG and PM_{10} would exceed the applicable YSAQMD thresholds of significance. Accordingly, the BRPA

could violate an air quality standard or contribute substantially to an existing or projected air quality violation.

Table 4.3-12
Maximum Unmitigated Operational Emissions – BRPA

	ROG	NO_X	PM_{10}*
Project Emissions	24.6 tons/yr	9.27 tons/yr	95.9 lbs/day
YSAQMD Significance Threshold	*10.00 tons/yr*	*10.00 tons/yr*	*80.00 lbs/day*
Exceeds Threshold?	**YES**	**NO**	**YES**

* The CalEEMod modeling includes 95.864 lbs/day of mobile source PM_{10} emissions and 0.0528 lbs/day of area source emissions. Rounding within the CalEEMod report has resulted in slight differences in summation.

Source: CalEEMod, October 2024 (see Appendix C).

Conclusion

Based on the above, operation of the Proposed Project and the BRPA could violate an air quality standard or contribute substantially to an existing or projected air quality violation. Therefore, the Proposed Project and BRPA would be considered to result in a ***significant*** impact related to air quality.

Mitigation Measure(s)

The majority of the operational ROG emissions are associated with area sources (11.9 tons/yr for the Proposed Project and 13.8 tons/yr for the BRPA), which are largely from consumer products (11.0 tons/yr for the Proposed Project and 13.0 tons/yr for the BRPA), and with the exception of 0.05 lbs/day associated with area sources, the entirety of operational PM_{10} emissions generated by the Proposed Project/BRPA are associated with mobile sources (88.4 lbs/day for the Proposed Project and 95.9 lbs/day for the BRPA).

Implementation of Mitigation Measure 4.3-2 would reduce the operational area source emissions associated with the Proposed Project and BRPA through the use of zero-VOC paints, finishes, adhesives, and cleaning supplies as shown in Table 4.3-13 and Table 4.3-14. However, as shown in the tables, even with implementation of Mitigation Measure 4.3-2, the Proposed Project's and BRPA's operational ROG emissions would continue to exceed the applicable thresholds of significance.

Table 4.3-13
Maximum Mitigated Operational Emissions – Proposed Project

	ROG	NO_X	PM_{10}
Project Emissions	20.5 tons/yr	8.6 tons/yr	88.4 lbs/day
YSAQMD Significance Threshold	*10.00 tons/yr*	*10.00 tons/yr*	*80.00 lbs/day*
Exceeds Threshold?	**YES**	**NO**	**YES**

Source: CalEEMod, October 2024 (see Appendix C).

Table 4.3-14
Maximum Mitigated Operational Emissions – BRPA

	ROG	NO_X	PM_{10}
Project Emissions	22.4 tons/yr	9.27 tons/yr	95.9 lbs/day
YSAQMD Significance Threshold	*10.00 tons/yr*	*10.00 tons/yr*	*80.00 lbs/day*
Exceeds Threshold?	**YES**	**NO**	**YES**

Source: CalEEMod, October 2024 (see Appendix C).

Possible additional mitigation measures for further reducing consumer product emissions 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 Ozone Attainment Plan includes existing and new control strategies intended to provide the necessary future emission reductions to meet the ozone NAAQS. Because the Proposed Project or BRPA has not been anticipated by the City's General Plan, the associated emissions have not been anticipated in the regional air quality plans. As such, any future updates to the air quality plans would have to take into account the emissions associated with buildout of the Proposed Project or BRPA (if approved) and include additional strategies to offset the overall regional emissions of ozone, including ROG emissions, through local and/or regional programs.

Feasible mitigation measures to reduce area source PM_{10} emissions are not available, as PM_{10} emissions associated with the Proposed Project/BRPA are almost entirely from mobile sources. Even if area source PM_{10} emissions were reduced to zero lbs/day, PM_{10} emissions associated with the Proposed Project/BRPA would still exceed the applicable YSAQMD threshold of significance. Therefore, mitigation measures to reduce PM_{10} emissions should be focused on mobile source emissions, rather than area source emissions.

With regard to mobile source emissions, implementation of Mitigation Measure 4.13-4 as set forth in the Transportation chapter of this EIR, which requires implementation of Transportation Demand Management (TDM) strategies to reduce the number of vehicle trips that would be generated by the residential component of the Proposed Project/BRPA, would further reduce the Proposed Project's/BRPA's operational mobile source ROG and PM_{10} emissions. However, as discussed therein, existing evidence indicates that the effectiveness of the TDM strategies with regards to vehicle trip reduction can vary based on a variety of factors, including the context of the surrounding built environment (e.g., urban versus suburban) and the aggregate effect of multiple TDM strategies deployed together. Moreover, many TDM strategies are not just site specific, but also rely on implementation and/or adoption by private entities (e.g., elective use of carpool program by residents) and other agencies (e.g., transit service operators). Thus, the effectiveness of the TDM strategies set forth within Mitigation Measure 4.13-4 cannot be quantified at this time and subsequent vehicle trip reduction effects cannot be guaranteed.

Furthermore, the Proposed Project's/BRPA'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 a reduction in mobile source emissions of criteria pollutants, including ROG 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 (beyond the Proposed Project's/BRPA's inherent site and/or design features and the measures included in Mitigation Measure 4.13-4), sufficient to reduce emissions of ROG and PM_{10} to below the applicable thresholds of significance, are not available, nor feasible for the Proposed Project or BRPA at this time.

Therefore, even with the implementation of feasible mitigation measures, the Proposed Project's/BRPA's operational ROG and PM_{10} emissions would remain *significant and unavoidable*.

Proposed Project, Biological Resources Preservation Alternative

4.3-2 *The following requirement shall be included in the Covenants, Conditions, and Restrictions (CC&Rs) for the residential subdivisions and all commercial and residential leases: Only zero-VOC paints, finishes, adhesives, and cleaning supplies shall be used for all buildings on the project site. Prior to approval of improvement plans for each small lot tentative map, draft language shall be provided to the City of Davis Community Development Department for review and approval.*

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

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

Localized CO Emissions

The following includes a discussion of impacts related to localized CO emissions associated with both the Proposed Project and the BRPA.

Proposed Project, Biological Resources Preservation Alternative

Localized concentrations of CO are related to the levels of traffic and congestion along streets and at intersections. Concentrations of CO approaching the AAQS are only expected where background levels are high, and traffic volumes and congestion levels are high. Implementation of the Proposed Project/BRPA would increase traffic volumes on streets near the project site/BRPA site; therefore, the Proposed Project/BRPA would be expected to increase local CO concentrations.

As discussed in the Method of Analysis section above, considering that the law has changed with respect to how transportation-related impacts may be addressed under CEQA such that unacceptable LOS is no longer considered a significant impact on the environment under CEQA, the analysis herein uses guidance from the nearby

SMAQMD and PCAPCD. According to the SMAQMD's CEQA Guidelines, emissions of CO are generally of less concern than other criteria pollutants, as operational activities are not likely to generate substantial quantities of CO, and the SVAB has been in attainment for CO for multiple years. Additionally, the PCAPCD, which has jurisdiction over a portion of the SVAB and is adjacent to the YSAQMD, has a screening level for localized CO impacts. According to the PCAPCD screening levels, a project could result in a significant impact if the project would result in CO emissions from vehicle operations in excess of 550 lbs/day.

According to the modeling performed for the Proposed Project and BRPA, operation of the Proposed Project would result in maximum unmitigated mobile source CO emissions of 425 lbs/day, and operation of the BRPA would result in maximum unmitigated mobile source CO emissions of 462 lbs/day (see Appendix C). Consequently, CO emissions related to mobile sources associated with operation of both the Proposed Project and BRPA would be below the 550 lbs/day screening threshold used by PCAPCD. Therefore, according to the PCAPCD's screening methodology for localized CO emissions, the Proposed Project/BRPA would not be expected to generate localized CO emissions that would contribute to an exceedance of AAQS, and the Proposed Project/BRPA would not expose sensitive receptors to substantial concentrations of localized CO.

TAC Emissions

The following includes a discussion of impacts related to TAC emissions associated with both the Proposed Project and the BRPA.

Proposed Project, Biological Resources Preservation Alternative

Another category of environmental concern is TACs. Health risks associated with TACs are a function of both the concentration of emissions and the duration of exposure, where the higher the concentration and/or the longer the period of time that a sensitive receptor is exposed to pollutant concentrations would correlate to a higher health risk. The CARB's Handbook provides recommended setback distances for sensitive land uses from major sources of TACs, including, but not limited to, freeways and high traffic roads, GDFs, chrome plating operations, 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.

Operational-related emissions of TACs are typically associated with stationary diesel engines or land uses that involve heavy truck traffic or idling. The proposed land uses would not involve long-term or frequent operations of any stationary diesel engines and would not involve heavy truck traffic or idling. Thus, neither the Proposed Project nor the BRPA would expose sensitive receptors to substantial concentrations of DPM during operations.

Construction-related activities have the potential to generate concentrations of TACs, specifically DPM, from on-road haul trucks and off-road equipment exhaust emissions. The construction period would be temporary and would occur over a relatively short duration in comparison to the operational lifetime of the Proposed Project/BRPA. While

methodologies for conducting health risk assessments are associated with long-term exposure periods (e.g., over a 30-year period or longer), construction activities associated with Phase 1 of the Proposed Project and BRPA were estimated to occur over an approximately four-year period, and each subsequent development phase would be anticipated to occur over an even shorter time period. In addition, only portions of the site would be disturbed at a time throughout the construction period, with operation of construction equipment occurring intermittently throughout the course of a day, rather than continuously at any one location on the project site/BRPA site.

All construction equipment and operation thereof would be regulated per the In-Use Off-Road Diesel Vehicle Regulation. The In-Use Off-Road Diesel Vehicle Regulation includes emissions reducing requirements such as limitations on vehicle idling, disclosure, reporting, and labeling requirements for existing vehicles, as well as standards relating to fleet average emissions and the use of Best Available Control Technologies (BACTs).

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, the typical long-term exposure periods associated with conducting health risk assessments, and compliance with regulations, the likelihood that any one nearby sensitive receptor would be exposed to high concentrations of DPM for any extended period of time would be low.

Furthermore, as discussed above, both the Proposed Project's and the BRPA's construction-related emissions would be below the applicable mass emissions thresholds of significance for PM_{10}. According to CARB, more than 90 percent of DPM is less than one micrometer in diameter,[43] and, thus, DPM is a subset of $PM_{2.5}$, which comprises a portion of PM_{10}. As a California statewide average, DPM comprises about eight percent of $PM_{2.5}$ in outdoor air,[44] and would represent an even smaller percentage of PM_{10} emissions. Considering that the Proposed Project's/BRPA's construction-related PM_{10} emissions, which include emissions of DPM, would be below the YSAQMD's thresholds of significance, construction of the Proposed Project/BRPA would not be expected to generate substantial DPM emissions such that an increase in cancer risk levels of more than 10 in one million persons or a non-cancer hazard index greater than 1.0 would occur.

Based on the above, the Proposed Project/BRPA would not expose sensitive receptors to substantial concentrations of DPM during construction.

Criteria Pollutants

The following includes a discussion of impacts related to criteria pollutant emissions associated with both the Proposed Project and the BRPA.

[43] California Air Resources Board. *Inhalable Particulate Matter and Health ($PM_{2.5}$ and PM_{10}).* Available at: https://ww2.arb.ca.gov/resources/inhalable-particulate-matter-and-health. Accessed March 2024.

[44] California Air Resources Board. *Overview: Diesel Exhaust & Health.* Available at: https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health. Accessed March 2024.

Proposed Project, Biological Resources Preservation Alternative

As discussed in the Existing Environmental Setting section and summarized in Table 4.3-1, criteria pollutant emissions can cause negative health effects. With regard to the Proposed Project and BRPA, the principal criteria pollutants of concern are localized CO, ozone, and PM. The Proposed Project and BRPA are not anticipated to result in impacts related to localized exposure of sensitive receptors to substantial concentrations of CO. Unlike CO and many TACs, due to atmospheric chemistry and dynamics, ozone and atmospheric PM typically act to impact public health on a cumulative and regional level, rather than a localized level. Due to the cumulative and regional nature of effects from criteria pollutants, the analysis of potential health effects of criteria pollutants is further discussed in Impact 4.3-6.

Conclusion

Based on the above, the Proposed Project/BRPA would not result in the exposure of sensitive receptors to substantial levels of pollutant concentrations, and a ***less-than-significant*** impact would result.

Mitigation Measure(s)

None required.

4.3-4 Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. Based on the analysis below, the impact is *less than significant*.

Pollutants of principal concern include emissions leading to odors, emissions that have the potential to cause dust, or emissions considered to constitute air pollutants. Air pollutants have been discussed in Impacts 4.3-1 through 4.3-3 above. Therefore, the following discussion focuses on emissions of odors and dust.

Odors

The following includes a discussion of impacts related to odors associated with both the Proposed Project and the BRPA.

Proposed Project, Biological Resources Preservation Alternative

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 analysis to determine the presence of a significant odor impact is difficult. 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.[45] The Proposed Project/BRPA would not introduce any such land uses and is not located in the vicinity of any such existing or planned land uses.

[45] Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts [pg. 14].* July 11, 2007.

Construction activities often include diesel-fueled equipment and heavy-duty trucks, which could create odors associated with diesel fumes that may be considered objectionable. However, construction activities would be temporary and operation of construction equipment would be regulated in accordance with the In-Use Off-Road Diesel Vehicle Regulation, as discussed above. In addition, as required by Mitigation Measure 4.10-1 of this EIR, construction activities would be limited to normal daytime working hours (i.e., 7:00 AM to 7:00 PM Monday through Friday and 8:00 AM to 8:00 PM Saturday and Sunday). The Proposed Project/BRPA would also 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. Considering the large development area and buildout over multiple phases, construction equipment would operate at various locations throughout the project site intermittently, and the distances from the nearest sensitive receptors would allow for dispersal of diesel odors. Accordingly, substantial objectionable odors would not be expected to occur during construction activities.

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 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 or BRPA is developed, the YSAQMD would ensure that such odors are satisfactorily addressed.

Dust

The following includes a discussion of impacts related to dust associated with both the Proposed Project and the BRPA.

Proposed Project, Biological Resources Preservation Alternative

As noted previously, the Proposed Project and BRPA are required to comply with all applicable YSAQMD rules and regulations for construction, including, but not limited to, Rule 2.1 (Control of Emissions), Rule 2.5 (Nuisance), and Rule 2.11 (Particulate Matter Concentration). Furthermore, according to YSAQMD Guidance, even projects not exceeding the YSAQMD construction-related PM thresholds should implement best management practices to reduce dust emissions and avoid localized health impacts, as described in Impact 4.3-1, above. Compliance with YSAQMD rules and regulations and best management practices would help to ensure that dust is minimized during project construction. Following project construction, vehicles operating within the project site/BRPA site would be limited to paved areas of the site, which would not have the potential to create substantial dust emissions. Thus, Proposed Project/BRPA operations would not include sources of dust that could adversely affect a substantial number of people.

Conclusion

For the aforementioned reasons, construction and operations associated with the Proposed Project and BRPA would not result in substantial emissions, such as those leading to odors or dust, which could adversely affect a substantial number of people, and a ***less-than-significant*** impact would result.

Mitigation Measure(s)

None required.

4.3-5 Result in the inefficient or wasteful use of energy, or conflict with a State or local plan for renewable energy or energy efficiency. Based on the analysis below, the impact is *less than significant*.

Energy use associated with construction of the Proposed Project and BRPA, as well as building energy use and transportation energy use associated with operations of the Proposed Project and BRPA, are discussed separately below.

Construction Energy Use

The following includes a discussion of impacts related to construction energy use associated with both the Proposed Project and the BRPA.

Proposed Project, Biological Resources Preservation Alternative

Construction of the Proposed Project and BRPA would involve increased energy demand and consumption related to use of oil in the form of gasoline and diesel fuel for construction worker vehicle trips, hauling and materials delivery truck trips, and operation of off-road construction equipment. In addition, diesel-fueled portable generators may be necessary to provide additional electricity demands for temporary lighting, welding, and for supplying energy to areas of the site where energy supply cannot be met through a hookup to the existing electricity grid; however, grid power would be used as opposed to diesel generators, where feasible.

Typically, at construction sites, electricity from the existing grid is used to power portable and temporary lights or office trailers. Because grid electricity would be used primarily for steady sources such as lighting, not sudden, intermittent sources such as welding or other hand-held tools, the increase in electricity usage at the site during construction would not be expected to cause any substantial peaks in demand. Construction of the Proposed Project/BRPA, which would result in temporary increases in electricity demand, would not cause a permanent or substantial increase in demand that would exceed PG&E's demand projections or exceed the ability of PG&E's existing infrastructure to handle such an increase. Therefore, construction of the Proposed Project or BRPA would not result in any significant impacts on local or regional electricity supplies, the need for additional capacity, or on peak or base period electricity demands. In addition, standards or regulations specific to construction-related electricity usage do not currently exist.

Even during the most intense period of construction, due to the different types of construction activities (e.g., site preparation, grading, building construction), only

portions of the project site/BRPA site would be disturbed at a time, with operation of construction equipment occurring at different locations on the project site/BRPA site, rather than a single location. In addition, all construction equipment and operation thereof would be regulated pursuant to the CARB In-Use Off-Road Diesel Vehicle Regulation. The In-Use Off-Road Diesel Vehicle Regulation is intended to reduce emissions from in-use, off-road, heavy-duty diesel vehicles in California by imposing a five-minute limit on idling, requiring all vehicles to be reported to CARB, restricting the addition of older vehicles into fleets, and requiring fleets to reduce emissions by retiring, replacing, or repowering older engines, or installing exhaust retrofits. Furthermore, as a means of reducing emissions, construction vehicles are required to become cleaner through the use of renewable energy resources. Engine tiers are used to describe the emissions intensity and efficiency of an engine. Construction equipment with Tier 0 or Tier 1 engines are the least efficient, and Tier 4 is the most efficient. In November 2021, the CARB began developing standards for Tier 5 engines. All fleets are currently prohibited from adding Tier 0, Tier 1, or Tier 2 vehicles to the fleet. In addition, starting January 1, 2024, fleets with a total horsepower over 2,501, excluding non-profit training centers, may not add any Tier 3 or Tier 4 Interim vehicles.[46] The In-Use Off-Road Diesel Vehicle Regulation would, therefore, help to improve fuel efficiency for equipment used in construction of the Proposed Project/BRPA.

The CARB enforces off-road equipment regulations through their reporting system, Diesel Off-road Online Reporting System (DOORS). Each construction fleet is required to update their DOORS account within 30 days of buying or selling a vehicle, and DOORS automatically calculates the fleet average index for each fleet. The fleet average index is an indicator of a fleet's overall emission rate, and is based on each vehicle's engine horsepower and model year, and whether it is equipped with a Verified Diesel Emission Control Strategy (VDECS). If a fleet cannot, or does not want to, meet the fleet average target in a given year, the fleet may instead choose to comply with the BACT requirements. A fleet may meet the BACT requirements each year by turning over or installing VDECS on a certain percentage of its total fleet horsepower. 'Turnover' means retiring a vehicle, designating a vehicle as permanent low-use (a vehicle used less than 200 hours per year), repowering a vehicle with a higher tier engine, or rebuilding the engine to a more stringent emission standard. By each compliance date (annually on January 1st), the fleet must either show that its fleet average index was less than or equal to the calculated fleet average target rate, or that the fleet has met the BACT requirements.[47] The project would be required to comply with such regulations, which would ensure that construction equipment meets all State efficiency requirements.

Technological innovations and more stringent standards are being researched, such as multi-function equipment, hybrid equipment, or other design changes, which could help to further reduce demand on oil and limit emissions associated with construction. Over time, as technology progresses and more stringent emissions standards are put in place, construction equipment engines become increasingly efficient. Proposed

[46] California Air Resources Board. *Amendments to the In-Use Off-Road Diesel-Fueled Fleets Regulation*. August 29, 2023.

[47] California Air Resources Board. *Frequently Asked Questions, Regulation for In-Use Off-Road Diesel-Fueled Fleets (Off-Road Regulation)*. August 2014.

Project/BRPA construction would also be required to comply with all applicable YSAQMD rules and regulations, which are indirectly related to energy efficiency, which would help to further reduce energy use associated with the Proposed Project/BPRA.

Based on the above, the temporary increase in energy use occurring during construction of the Proposed Project/BPRA would not result in a significant increase in peak or base demands or require additional capacity from local or regional energy supplies. In addition, the Proposed Project/BRPA would be required to comply with all applicable regulations related to energy conservation and fuel efficiency, which would help to reduce the temporary increase in demand.

Building Energy Demand

The following includes a discussion of impacts related to building energy demand associated with both the Proposed Project and the BRPA.

Proposed Project, Biological Resources Preservation Alternative

The Proposed Project and BRPA would both include development of residential, neighborhood service, public, semi-public, and educational uses. Energy use associated with operation of the Proposed Project/BRPA would be typical of such uses, requiring electricity for interior and exterior building lighting, heating, ventilation, and air conditioning (HVAC) systems, electronic equipment, machinery, refrigeration, appliances, security systems, and more. Maintenance activities during operations, such as landscape maintenance, would involve the use of electric or gas-powered equipment.

The Proposed Project and BRPA are required to comply with all applicable standards and regulations regarding energy conservation and fuel efficiency, including the CBSC and CARB standards, which would ensure that the future uses would be designed to be energy efficient to the maximum extent practicable. Adherence to the most recent CALGreen Code and the Building Energy Efficiency Standards would ensure that the proposed development on-site would consume energy efficiently through the incorporation of such features as efficient water heating systems, high performance attics and walls, and high efficacy lighting. As required by Section 8.01.090 of the Municipal Code, the Proposed Project/BRPA would comply with Tier 1 standards of the CALGreen Code, which would otherwise be voluntary under the CBSC. The Proposed Project and BRPA would also both be subject to the requirements included in Sections 8.01.060, 8.01.100, and 8.01.110 of the Municipal Code, and all applicable CAAP measures related to energy demand, as discussed in the Regulatory Context section, above. In addition, the 2022 CBSC and the 2022 Building Energy Efficiency Standards also require that newly constructed residential and non-residential buildings, including grocery stores, offices, financial institutions, unleased tenant space, retail space, schools, warehouses, auditoriums, convention centers, hotel/motels, libraries, medical office building/clinics, and theaters, be developed to include a solar PV system. Therefore, a portion of the electricity demand associated with the Proposed Project/BRPA would be met by on-site renewable energy.

State regulations promote the generation of renewable energy and encourage energy efficiency through requirements placed on utility providers and strict development standards. For instance, the RPS require utilities, including the PG&E and VCE, to

procure an increasing proportion of electricity from renewable sources. Ultimately the RPS requirements mandate that all electricity produced within the State be renewably sourced by the year 2045.

Based on the air quality modeling prepared for the Proposed Project, the Proposed Project is anticipated to result in increased electricity consumption of approximately 14.02 GWh annually during operations. Compared to the electricity consumption for all of Yolo County, the Proposed Project's contribution would represent a 0.78 percent increase in annual electricity demand as compared to current conditions.

Similarly, based on the air quality modeling prepared for the BRPA, the BRPA is anticipated to result in increased electricity consumption of approximately 13.33 GWh annually during operations. Compared to the electricity consumption for all of Yolo County, the BRPA's contribution would represent a 0.74 percent increase in electricity demand as compared to current conditions.

Although the Proposed Project/BRPA would increase electricity demand in the project/BRPA area, the increased demand is not anticipated to conflict with the PG&E's or VCE's ability to meet the RPS requirements, or exceed PG&E's or VCE's capacity such that the energy demands associated with the Proposed Project/BRPA would not be met. Neither the Proposed Project nor the BRPA would include the use of natural gas.

Increased energy does not necessarily mean that a project would have an impact related to energy resources. Based on Appendix F of the CEQA Guidelines, a proposed project would result in an impact related to energy resources if a project would result in the inefficient use or waste of energy. As stated above, the Proposed Project/BRPA would be required to comply with the efficiency standards set forth in the CBSC, CALGreen Code, Building Energy Efficiency Standards, CARB, the City's Municipal Code, and the City's CAAP, and the Proposed Project/BRPA would not conflict with or obstruct any State or local plans related to renewable energy.

With regard to landscaping and maintenance equipment, AB 1346 requires all new small off-road engines sold after January 1, 2024 to be all-electric. By the time the Proposed Project/BRPA is operational, a reasonable assumption can be made that at least a portion of the landscaping and maintenance equipment that would be used on-site would be electric. Given that electricity from PG&E and VCE is partially generated from renewable sources, the use of electric landscaping and maintenance equipment would be considered more energy efficient than diesel- or gas-powered landscaping and maintenance equipment.

Transportation Energy Demand

The following includes a discussion of impacts related to transportation energy demand associated with both the Proposed Project and the BRPA.

Proposed Project, Biological Resources Preservation Alternative

In addition to on-site energy use, the Proposed Project and BRPA would both result in transportation energy use associated with vehicle trips generated by residents, visitors, and employees travelling to and from the project site/BRPA site.

The average fuel economy for the U.S. passenger vehicle fleet was 24.8 miles per gallon (mpg) in 2022, the most recent year such data is available.[48] In addition, petroleum refineries in the U.S. typically produce approximately 20 gallons of gasoline from one 42-gallon barrel of crude oil.

Using an average of 24.8 mpg and an annual VMT of approximately 44,900,000,[49] the Proposed Project would result in the consumption of approximately 90,524 barrels of crude oil per year. Similarly, using an average of 24.8 mpg and an annual VMT of approximately 47,900,000,[50] the BRPA would result in the consumption of approximately 96,573 barrels of crude oil per year.

California is estimated to consume approximately 605 million barrels of petroleum per year.[51] Based on the annual consumption within the State, vehicle trips generated by both the Proposed Project and the BRPA would result in an approximately 0.01 percent increase in the State's current consumption of gasoline.

The calculation above is likely an overestimate, as the estimate does not account for the increasing ownership of electric vehicles. California leads the nation in registered alternatively-fueled and hybrid vehicles. In fact, under SB 500, the State has required that, starting in the year 2030, all cars sold shall be zero-emission/electric vehicles. In addition, State-specific regulations encourage fuel efficiency and reduction of dependence on oil. Improvements in vehicle efficiency and fuel economy standards help to reduce consumption of gasoline and reduce the State's dependence on petroleum products. The 2022 CBSC also requires new developments to include the necessary electrical infrastructure for EV charging stations. Based on the above, the actual consumption of gasoline associated with the Proposed Project/BRPA is anticipated to be even lower than the 0.01 percent statewide contribution noted above.

The Proposed Project and BRPA would both be required to comply with all applicable regulations associated with vehicle efficiency and fuel economy. In addition, buildout of the Proposed Project/BRPA would involve the provision of sidewalks throughout the project site/BRPA site, as well as several bicycle and pedestrian infrastructure improvements, as described in Impact 4.13-2 included in the Transportation chapter of this EIR and required by Mitigation Measures 4.13-2(a) through 4.13-2(h). Such improvements would provide pedestrian and bicycle connectivity within the project site/BRPA site, thereby helping to discourage driving and reduce vehicle trips and associated transportation energy demand.

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48 U.S. Energy Information Administration. *Total Energy, Table 1.8 Motor Vehicle Mileage, Fuel Consumption, and Fuel Economy*. Available at: https://www.eia.gov/totalenergy/data/browser/?tbl=T01.08#/?f=A&start=200001. Accessed March 2024.

49 The annual VMT estimate presented herein is based on the Transportation Impact Study prepared for the Proposed Project by Fehr & Peers.

50 *Ibid.*

51 U.S. Energy Information Administration. *California: State Profile and Energy Estimates*. Available at: https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_fuel/html/fuel_use_pa.html&sid=US&sid=CA. Accessed March 2024.

Conclusion

Based on the above, the Proposed Project/BRPA would not be considered to result in a wasteful, inefficient, or unnecessary use of energy, and neither the Proposed Project, nor the BRPA, is anticipated to conflict with a State or local plan for renewable energy or energy efficiency. Thus, impacts would be considered ***less than significant***.

Mitigation Measure(s)

None required.

Cumulative Impacts and Mitigation Measures

As defined in Section 15355 of the CEQA Guidelines, "cumulative impacts" refers to two or more individual effects which, when considered together, are considerable, compound, or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects.

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

Climate change occurs on a global scale, and emissions of GHGs, even from a single project, contribute to the global impact. However, due to the existing regulations within the State, for the purposes of this analysis, the geographic context for the analysis of GHG emissions presented in this EIR is the State of California.

Finally, a project's impacts related to energy use may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development projects. The following discussion of energy impacts is based on the implementation of the Proposed Project/BRPA in combination with buildout of the adopted City's General Plan, as well as a list of approved or planned local projects within the project area. Additional detail regarding the cumulative project setting can be found in Chapter 6, Statutorily Required Sections, of this EIR.

4.3-6 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). Based on the analysis below, even with implementation of mitigation, the project's incremental contribution to this significant cumulative impact is *cumulatively considerable* and *significant and unavoidable.*

Buildout of the Proposed Project/BRPA would lead to the release of emissions that would contribute to the cumulative regional air quality setting. The following section includes a discussion of both the Proposed Project's and the BRPA's contribution to

the cumulative operational emissions, and the cumulative health effects of exposure to criteria pollutants. Because construction would occur over a relatively short time period as compared to the operational lifetime of the Proposed Project/BRPA, construction emissions are not considered to be cumulative in nature.

Cumulative Emissions

The following includes a discussion of impacts related to cumulative criteria pollutant emissions associated with both the Proposed Project and the BRPA.

Proposed Project, Biological Resources Preservation Alternative

The Proposed Project/BRPA is within an area currently designated as nonattainment for ozone and PM AAQS. By nature, air pollution is largely a cumulative impact. Thus, the Proposed Project/BRPA, in combination with other proposed and pending projects in the region, would significantly contribute to air quality effects within the SVAB, resulting in an overall significant cumulative impact. However, any single project is not sufficient enough in size to, alone, result in nonattainment of AAQS. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's incremental impact on air quality would be considered significant. In developing thresholds of significance for air pollutants, YSAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the significance thresholds, as identified by the YSAQMD and shown in Table 4.3-8 above, that project's emissions would be cumulatively considerable, resulting in a significant adverse air quality impact to the region's existing air quality conditions.[52]

Accordingly, if the Proposed Project/BRPA would result in an increase of ROG, NO_X, or PM_{10} in excess of the YSAQMD's operational phase cumulative-level emissions thresholds, which are equivalent to the YSAQMD's project-level operational emissions thresholds, the project could potentially result in a significant incremental contribution towards cumulative air quality impacts. The Proposed Project's and BRPA's unmitigated cumulative contribution to regional emissions are equivalent to the Proposed Project's and BRPA's unmitigated operational emissions, as presented in Table 4.3-11 and Table 4.3-12.

As shown in Table 4.3-11 and Table 4.3-12, unmitigated operational emissions of NO_X associated with both the Proposed Project and the BRPA would be below the YSAQMD's applicable thresholds of significance. However, the Proposed Project and BRPA would result in operational emissions of ROG and PM_{10} that would exceed the applicable YSAQMD thresholds of significance. Therefore, the Proposed Project and BRPA could result in a cumulatively considerable net increase of a criteria pollutant for which the project region is in non-attainment.

Cumulative Health Effects of Criteria Pollutants

The following includes a discussion of cumulative health impacts related to criteria pollutant emissions associated with both the Proposed Project and the BRPA.

[52] Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts* [pg. 7]. July 11, 2007.

Proposed Project, Biological Resources Preservation Alternative

The AAQS presented in Table 4.3-2 are health-based standards designed to ensure safe levels of criteria pollutants that avoid specific adverse health effects. Because the YSAQMD is designated as nonattainment for ozone, PM_{10}, and $PM_{2.5}$, the YSAQMD, along with other air districts in the SVAB region, has adopted federal and State attainment plans to demonstrate progress towards attainment of the AAQS. Full implementation of the attainment plans would ensure that the AAQS are attained and sensitive receptors within the SVAB are not exposed to excess concentrations of criteria pollutants. The YSAQMD's thresholds of significance were established with consideration given to the health-based air quality standards established by the AAQS and are designed to aid the district in implementing the applicable attainment plans to achieve attainment of the AAQS. Thus, if a project's criteria pollutant emissions exceed the YSAQMD's mass emission thresholds of significance, a project would be considered to conflict with or obstruct implementation of the YSAQMD's air quality planning efforts, thereby delaying attainment of the AAQS. Because the AAQSs are representative of safe levels that avoid specific adverse health effects, a project's hinderance of attainment of the AAQS could be considered to contribute towards regional health effects associated with the existing nonattainment status of ozone and PM standards. However, as noted above, ascertaining cancer risk, or similar measurements of health effects from air pollutants, is very difficult for regional pollutants such as the ozone precursors ROG and NO_X, as there might be scientific limitations on an agency's ability to make the connection between air pollutant emissions and public health consequences in a credible fashion, given limitations in technical methodologies. For example, ozone concentrations depend upon various complex factors, including the presence of sunlight and precursor pollutants, natural topography, nearby structures that cause building downwash, atmospheric stability, and wind patterns. Because of the complexities of predicting ground level ozone concentrations related to the NAAQS and CAAQS, it is not possible to link health risks to the magnitude of emissions exceeding the significance thresholds.

Nonetheless, as discussed in Impact 4.3-2, operation of the Proposed Project and BRPA would result in emissions that exceed the YSAQMD's thresholds of significance. Consequently, implementation of the Proposed Project and BRPA could conflict with the YSAQMD's adopted attainment plans or inhibit attainment of regional AAQS. Therefore, implementation of the Proposed Project and BRPA could contribute towards regional health effects associated with the existing nonattainment status of ozone and PM standards.

Conclusion

Based on the above analysis, the Proposed Project's/BRPA's incremental contribution to the significant cumulative effect could be considered ***cumulatively considerable*** and, as a result, a ***significant*** impact could occur.

Mitigation Measure(s)

The following mitigation measure would reduce operational area-source ROG emissions. However, as discussed under Impact 4.3-2 above, with implementation of Mitigation Measure 4.3-2, operational area-source ROG emissions associated with the Proposed Project and BRPA would still not be reduced to below the applicable

thresholds of significance. In addition, possible additional mitigation measures for further reducing ROG emissions cannot be feasibly enforced or verified, and feasible mitigation measures to reduce area source PM_{10} emissions are not available, as PM_{10} emissions associated with the Proposed Project/BRPA are almost entirely from mobile sources.

With regard to mobile source emissions, implementation of Mitigation Measure 4.13-4 as set forth in the Transportation chapter of this EIR, which requires implementation of TDM strategies to reduce the number of vehicle trips that would be generated by the residential component of the Proposed Project/BRPA, would further reduce the Proposed Project's/BRPA's operational mobile source ROG and PM_{10} emissions. However, as detailed above, the effectiveness of the TDM strategies set forth within Mitigation Measure 4.13-4 cannot be quantified at this time and subsequent vehicle trip reduction effects cannot be guaranteed. Furthermore, additional measures for the reduction of mobile source emissions (beyond the Proposed Project's/BRPA's inherent site and/or design features and the measures included in Mitigation Measure 4.13-4), sufficient to reduce emissions of ROG and PM_{10} to below the applicable thresholds of significance, are not available, nor feasible for the Proposed Project or BRPA at this time.

Based on the above, even with implementation of the following mitigation measure, the Proposed Project's/BRPA's incremental contribution to the significant cumulative effect would remain *cumulatively considerable* and *significant and unavoidable*.

Proposed Project, Biological Resources Preservation Alternative

4.3-6 Implement Mitigation Measure 4.3-2.

4.3-7 Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs during construction. Based on the analysis below and with implementation of mitigation, the project's incremental contribution to this significant cumulative impact is *less than cumulatively considerable*.

Global climate change is inherently a cumulative effect that occurs over a long period of time and is quantified on a yearly basis. Therefore, operational GHG emissions are generally of greater concern as compared to construction-related GHG emissions, as construction-related GHG emissions are a one-time release that would occur over a relatively shorter time period and are not typically expected to generate a significant contribution to global climate change. Nonetheless, construction GHG emissions can marginally contribute to global climate change, and, thus, are discussed in further detail below.

As discussed above, the City has not specifically adopted goals or thresholds to analyze GHG emissions from construction of proposed projects. As such, the YSAQMD is currently recommending GHG analysis consistent with the SMAQMD's

adopted thresholds of significance. For construction-related GHG emissions, the SMAQMD has adopted a threshold of significance of 1,100 $MTCO_2e$/yr.

The following discussions include an analysis of the potential for the Proposed Project, as well as the BRPA to generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs during construction.

Proposed Project

Unmitigated construction-related GHG emissions have been estimated for development of Phase 1 of the Proposed Project, as presented in Table 4.3-15, below. As discussed in the Method of Analysis section above, due to the size of the Phase 1 disturbance area, the backbone infrastructure proposed to be constructed as part of Phase 1, and level of development included in Phase 1, Phase 1 of the Proposed Project would represent the most emissions-intensive phase of construction.

Table 4.3-15
Maximum Unmitigated Construction GHG Emissions ($MTCO_2e$/yr) – Proposed Project

Project GHG Emissions	Threshold of Significance	Exceeds Threshold?
1,274	1,100	**YES**

Source: CalEEMod, March 2024 (see Appendix C).

As shown in Table 4.3-15, the total unmitigated construction emissions associated with the Proposed Project would exceed the SMAQMD 1,100 $MTCO_2e$/yr threshold of significance. As a result, based on the applicable SMAQMD threshold of significance being applied for this analysis, as recommended by YSAQMD, implementation of the Proposed Project could generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHG during construction.

Biological Resources Preservation Alternative

Similar to the Proposed Project, unmitigated construction-related GHG emissions have been estimated for development of Phase 1 of the BRPA, as presented in Table 4.3-16, below.

Table 4.3-16
Maximum Unmitigated Construction GHG Emissions ($MTCO_2e$/yr) – BRPA

Project GHG Emissions	Threshold of Significance	Exceeds Threshold?
1,424	1,100	**YES**

Source: CalEEMod, November 2024 (see Appendix C).

As shown in Table 4.3-16, the total unmitigated construction emissions associated with the BRPA would exceed the SMAQMD 1,100 $MTCO_2e$/yr threshold of significance. As a result, based on the applicable SMAQMD threshold of significance being applied for this analysis, as recommended by YSAQMD, implementation of the BRPA could generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHG during construction.

Conclusion

Based on the above, implementation of both the Proposed Project and the BRPA could generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHG during construction. Thus, construction of the Proposed Project and BRPA could result in a ***cumulatively considerable*** incremental contribution to this significant cumulative impact.

Mitigation Measure(s)

Implementation of Mitigation Measure 4.3-7(a), which requires the use of renewable diesel fuel in all off-road equipment greater than 25 horsepower, would reduce the project's construction-related GHG emissions. As shown in Table 4.3-17, construction-related GHG emissions associated with the Proposed Project would be reduced to below the applicable SMAQMD threshold of significance.

However, as presented in Table 4.3-18, construction-related GHG emissions associated with the BRPA would still exceed the applicable SMAQMD threshold of significance with implementation of Mitigation Measure 4.3-7(a). Consequently, Mitigation Measure 4.3-7(b) would be required for the BRPA only, to ensure construction-related GHG emissions would be below the applicable SMAQMD threshold of significance.

Table 4.3-17
Maximum Mitigated Construction GHG Emissions ($MTCO_2e$/yr) – Proposed Project

Project GHG Emissions	Threshold of Significance	Exceeds Threshold?
1,086.93	1,100.00	**NO**

Source: CalEEMod, November 2024 (see Appendix C).

Table 4.3-18
Maximum Mitigated Construction GHG Emissions ($MTCO_2e$/yr) – BRPA

Project GHG Emissions	Threshold of Significance	Exceeds Threshold?
1,236.93	1,100.00	**NO**

Source: CalEEMod, November 2024 (see Appendix C).

Overall, implementation of the following mitigation measures would reduce the Proposed Project's and BRPA's incremental contribution to the above significant cumulative impact to *less than cumulatively considerable*.

Proposed Project, Biological Resources Preservation Alternative

4.3-7(a) *Prior to approval of any Improvement Plans and/or Grading Plans, the project applicant shall provide proof of compliance with the following to the satisfaction of the City of Davis Community Development Department:*

The project applicant shall show on the plans via notation that the contractor shall ensure that all off-road vehicles 25 horsepower or more to be used in the construction of the Proposed Project, including owned, leased, and subcontractor vehicles, shall be fueled by renewable diesel.

In addition, all off-road equipment operating at the construction site must be maintained in proper working condition according to manufacturer's specifications. Idling shall be limited to five minutes or less in accordance with the In-Use Off-Road Diesel Vehicle Regulation as required by CARB. Clear signage regarding idling restrictions shall be placed at the entrances to the construction site.

Portable equipment over 50 horsepower must have either a valid YSAQMD Permit to Operate (PTO) or a valid statewide Portable Equipment Registration Program (PERP) placard and sticker issued by CARB.

Proof of conformance with the foregoing requirements shall be submitted by the project contractor to the City of Davis Community Development and Public Works Departments for review and approval.

Biological Resources Preservation Alternative

4.3-7(b) *Prior to the initiation of construction of Phase 1 the BRPA, the project applicant shall demonstrate that construction-related GHG emissions would be reduced to 1,100 $MTCO_2e$/yr and shall submit proof to the City of Davis Community Development Department.*

Construction-related GHG emissions can be reduced through several options, including, but not limited to, the following:

- *Modify the construction schedule to reduce the intensity of construction to lower emissions;*
- *Ensure that phases of development do not overlap;*
- *Improve fuel efficiency from construction equipment by:*
    - *Minimizing idling time either by shutting equipment off when not in use or reducing the time of idling to no more than three minutes (five-minute limit is*

required by the state airborne toxics control measure [Title 13, sections 2449(d)(3) and 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site; and

- *Using equipment with new technologies (repowered engines, electric drive trains).*

- *Perform on-site emission reductions such as implementing on-site material hauling with trucks equipped with on-road engines (if determined to be less emissive than the off-road engines) or real, quantifiable, permanent, verifiable, and enforceable on-site emission reductions;*
- *Use alternative fuels for generators at construction sites such as propane or solar, or use electrical power;*
- *Use a CARB-approved low carbon fuel for construction equipment; (NOX emissions from the use of low carbon fuel must be reviewed and increases mitigated.)*
- *Encourage and provide carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes;*
- *Reduce electricity use in the construction office by using LED bulbs, powering off computers every day, and replacing heating and cooling units with more efficient ones;*
- *Recycle or salvage non-hazardous construction and demolition debris (goal of at least 75 percent by weight);*
- *Use locally sourced or recycled materials for construction materials (goal of at least 20 percent based on costs for building materials, and based on volume for roadway, parking lot, sidewalk and curb materials). Wood products utilized should be certified through a sustainable forestry program;*
- *Minimize the amount of concrete for paved surfaces or utilize a low carbon concrete option;*
- *Produce concrete on-site if determined to be less emissive than transporting ready mix;*
- *Use SmartWay certified trucks for deliveries and equipment transport; and*
- *Develop a plan to efficiently use water for adequate dust control.*

The project applicant may elect to implement any combination of the foregoing measures to reduce construction-related GHG emissions. All GHG emissions reductions must be quantified. Compliance with the aforementioned measures shall be ensured by the City of Davis Community Development and Public Works Department.

If the quantified reduction measures do not reduce construction-related GHG emissions associated with Phase 1 of the BRPA to

below 1,100 $MTCO_2e$/yr, offsite carbon credits may be purchased to make up the difference. The purchase of off-site mitigation credits shall be negotiated with the City and YSAQMD at the time that credits are sought. Off-site mitigation credits shall be real, quantifiable, permanent, verifiable, enforceable, and additional, consistent with the standards set forth in Health and Safety Code section 38562, subdivisions (d)(1) and (d)(2). The offsets shall be retired, and emissions must be offset through the year 2045. Such credits shall be based on CARB-approved protocols that are consistent with the criteria set forth in subdivision (a) of Section 95972 of Title 17 of the California Code of Regulations, and shall not allow the use of offset projects originating outside of California, except to the extent that the quality of the offsets, and their sufficiency under the standards set forth herein, can be verified by the City of Davis and/or the YSAQMD. Such credits must be purchased through one of the following: (i) a CARB-approved registry, such as the Climate Action Reserve, the American Carbon Registry, and the Verified Carbon Standard; (ii) any registry approved by CARB to act as a registry under the California Cap and Trade program; or (iii) any registry established by YSAQMD.

4.3-8 Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs during operation. Based on the analysis below and with implementation of mitigation, the project's incremental contribution to this significant cumulative impact is *cumulatively considerable* and *significant and unavoidable*.

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

Implementation of both the Proposed Project and the BRPA would cumulatively contribute to increases of GHG emissions that are associated with global climate change. Estimated GHG emissions attributable to future development would be primarily associated with increases of CO_2 and, to a lesser extent, other GHG pollutants, such as CH_4 and N_2O. Sources of GHG emissions include area sources, mobile sources or vehicles, utilities (electricity and natural gas), water usage, wastewater generation, and the generation of solid waste.

As discussed above, the City of Davis has recently adopted a CAAP, as well as emissions reductions targets and emissions allowances for projects within the City. In March of 2019, the City adopted a resolution declaring a climate change emergency and accelerating the City's previously identified emissions reductions goal to a new

goal of carbon neutrality by the year 2040. In recognition of the City Council's actions and emissions reductions efforts and policies enacted by the City's CAAP, for the purposes of this EIR, the Proposed Project/BRPA would be considered to have a significant impact if emissions from Proposed Project/BRPA operations would result in net positive operational emissions in the year 2040. Should the Proposed Project/BRPA be shown to reach net neutrality by the year 2040 compared to existing emissions levels associated with the site, the Proposed Project/BRPA would be considered to provide a proportional share of emissions reductions and would not inhibit attainment of citywide net carbon neutrality by the year 2040, nor would the Proposed Project/BRPA conflict with the City's CAAP.

The following discussions include an analysis of the potential for the Proposed Project, as well as the BRPA to generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs during operation.

Proposed Project

The total unmitigated annual operational GHG emissions for the first full year of operation for full buildout of the Proposed Project (assumed to be 2033) were estimated as presented in Table 4.3-19, as emissions from the first full year of operation represent the most conservative assumptions.

Table 4.3-19
Unmitigated Operational GHG Emissions ($MTCO_2e$/yr) – Proposed Project

Source	Annual GHG Emissions
Mobile	16,262
Area	23.5
Energy	1,318
Water	139
Waste	413
Refrigerants	3.47
Total Annual Operational GHG Emissions	**18,160**

Note: Rounding may result in slight differences in summation.

Source: CalEEMod, March 2024 (see Appendix C).

As shown in the table, maximum annual emissions resulting from project operations would equal 18,160.00 $MTCO_2e$/yr. Between 2033 and 2040, existing State regulations, such as EV requirements, would act to reduce emissions from the levels shown in Table 4.3-19. In addition, while the Proposed Project cannot rely solely on compliance with the CAAP GHG emissions reduction and climate change adaptation actions, the project applicant has committed to several project design features that would ensure the Proposed Project is developed in accordance with the CAAP goals. For example, the project applicant has committed to the prohibition of natural gas on site; a portion of on-site units would be affordable housing units; the Proposed Project would include several bicycle and pedestrian infrastructure improvements; and the Proposed Project would implement TDM strategies to reduce VMT, as required by

Mitigation Measure 4.13-4 of this EIR. Such project design features were accounted for in the Proposed Project modeling, as applicable.

Nonetheless, project-specific features sufficient to reduce the anticipated emissions of 18,160.00 $MTCO_2e$/yr in the year 2033 to net carbon neutrality by the year 2040 are not currently included in the Proposed Project. Because project emissions could exceed net carbon neutrality in the year 2040, implementation of the Proposed Project would conflict with the City's recently adopted goal of carbon neutrality by the year 2040.

In addition, the Proposed Project would be required to implement all applicable GHG emissions reduction actions included in the City's CAAP. The Proposed Project's consistency with the reduction actions set forth in the CAAP is discussed in further detail below.

Biological Resources Preservation Alternative

Similar to the Proposed Project, the total unmitigated annual operational GHG emissions for the first full year of operation for full buildout of the BRPA (assumed to be 2033) were estimated as presented in Table 4.3-20, as emissions from the first full year of operation represent the most conservative assumptions.

Table 4.3-20
Unmitigated Operational GHG Emissions ($MTCO_2e$/yr) – BRPA

Source	Annual GHG Emissions
Mobile	17,389
Area	23.5
Energy	1,246
Water	138
Waste	406
Refrigerants	3.8
Total Annual Operational GHG Emissions	**19,206**

Note: Rounding may result in slight differences in summation.

Source: CalEEMod, March 2024 (see Appendix C).

As shown in the table, maximum annual emissions resulting from project operations would equal 19,206.00 $MTCO_2e$/yr. Between 2033 and 2040, existing State regulations would act to further reduce emissions from the levels shown in Table 4.3-20. In addition, similar to the Proposed Project, while the BRPA cannot rely solely on compliance with the CAAP GHG emissions reduction and climate change adaptation actions, the project applicant has committed to the same project design features for the BRPA as listed for the Proposed Project, above, which would ensure the BRPA is developed in accordance with the CAAP goals. Such project design features were accounted for in the BRPA modeling, as applicable.

Nonetheless, project-specific features sufficient to reduce the anticipated emissions of 19,206.00 $MTCO_2e$/yr in the year 2033 to net carbon neutrality by the year 2040 are not currently included in the BRPA. Because project emissions could exceed net

carbon neutrality in the year 2040, implementation of the BRPA would conflict with the City's recently adopted goal of carbon neutrality by the year 2040.

In addition, the BRPA would be required to implement all applicable GHG emissions reduction actions included in the City's CAAP. The BRPA's consistency with the reduction actions set forth in the CAAP is discussed in further detail below.

City of Davis Climate Action and Adaptation Plan

The primary goal of a CAAP is to provide a plan for reducing GHG emissions. The City of Davis CAAP identifies reduction actions intended to reduce future GHG emissions to 37 percent below 2016 levels by 2030 and set the community on a trajectory toward the 2040 carbon neutrality goal.

The following discussion includes an analysis of the Proposed Project's and the BRPA's consistency with the City of Davis CAAP.

Proposed Project, Biological Resources Preservation Alternative

The majority of the reduction actions included within the City's CAAP are targeted for implementation at the City-level, and are, therefore, not applicable to the Proposed Project or the BRPA. For example, under CAAP Action BE.6, the City would establish a carbon mitigation fund to collect voluntary and/or mandatory payments to mitigate local emissions activities, with collected funds used to support a range of local, climate-change-related projects. The Proposed Project/BRPA could be subject to the referenced program, should any such program be adopted by the City in the future. However, CAAP Action BE.6, and many of the other measures included in the CAAP, are not directly applicable to the Proposed Project or the BRPA.[53]

Both the Proposed Project and the BRPA would be generally consistent with the remaining CAAP actions that are applicable to the Proposed Project/BRPA. Specifically, Action TR.11 aims to "develop sustainable housing", which is further expanded on as "Increase housing opportunities to support the jobs/housing balance and decrease vehicle miles traveled. Develop incentive options to increase housing construction in the City, including high-density, mixed-use (especially office space and food service), transit oriented, and affordable options." Both the Proposed Project and the BRPA would consist of a mixed-use development community, including a total of 1,800 dwelling units, comprised of both affordable and market-rate single- and multi-family residences across various residential neighborhoods. In addition, the Proposed Project and the BRPA would include neighborhood services; public, semi-public, and educational uses; associated on-site roadway improvements; utility improvements;

[53] Additional CAAP actions not applicable to the Proposed Project/BRPA include voluntary Actions BE.1 and BE.2 related to existing buildings; actions related to implementation of future policies and programs that have not yet been developed within the City, such as Action BE.3, BE.8, TR.3, TR.4, TR.6, TR.7, TR.9, TR.10. WW.1, AD.1, AD.3, AD.5, CR.1, and CR.2; actions related to implementation of existing City programs not applicable to the Proposed Project/BRPA such as Action TR.1, which aims to implement specifically-located EV charging projects, as identified in the City's EV Charging Plan (none of which are located on or near the project site/BRPA site), and Action TR.8, which aims to implement parking improvements in the downtown area; and Actions, such as BE.7, TR.2, AD.4, and AD.6 related to requirements associated with City-owned facilities and transportation fleets or critical public infrastructure such as hospitals. Similar to the future program proposed by Action BE.6, should any program or policy be adopted by the City in the future related to the aforementioned actions, the Proposed Project/BRPA could be subject to such requirements, as applicable.

parks, open space, and greenbelts; and off-site improvements. Therefore, the Proposed Project and the BRPA are generally consistent with Action TR.11, as the Proposed Project/BRPA would increase housing opportunities, including high-density, mixed-use, transit oriented, and affordable options. While the Proposed Project and BRPA would have a significant VMT impact with respect to the VMT per capita standards used for the transportation analysis, Action TR.11 includes no explicit reference to new housing having to be at or below the City's VMT per capita thresholds. Instead, it correctly states that providing more local housing development will improve the City's jobs/housing balance, thereby resulting in fewer long-distance trips into the City from adjacent communities. The Action does reference the additive benefits of that housing having density, being situated in infill sites, and/or being a transit-oriented development. However, the policy does not conclude that this is the only type of housing that should be considered to achieve the Action. Therefore, the fact that the proposed project would result in increased per capita VMT does not in itself render the project inconsistent with Action TR.11.

As discussed above, neither the Proposed Project nor the BRPA would include the use of natural gas and, thus, the Proposed Project/BRPA would be consistent with Action BE.4 related to all-electric new construction. All on-site residents would also have the opportunity to opt into receiving energy from VCE, ensuring that the Proposed Project/BRPA would be consistent with Action BE.5, which is intended for the City to provide increased community solar energy by partnering with VCE to increase capacity in support of citywide building and transportation electrification, invest in community solar energy, and provide solar battery storage, as well as develop financing/incentive options to support building and transportation energy electrification and energy efficiency improvements. Action BE.5 also encourages all subscribers to enroll in the VCE UltraGreen option.

Several CAAP actions, such as Action TR.5, which is directly applicable to the Proposed Project and the BRPA, and Citywide actions such as Actions TR.3, TR.4, TR.6, and TR.7, are related to increasing the use of alternative transportation modes within the City. The Proposed Project and the BRPA would include several improvements to the bicycle and pedestrian network within the City, such as construction of new bicycle lanes, bicycle and pedestrian crossings, and incorporation of signage and traffic-calming measures to improve mode-share safety on internal roadways used by bicyclists. The aforementioned improvements would facilitate the use of alternative transportation modes within the City. Furthermore, several existing bus stops are located less than 0.25-mile from the project site/BRPA site along roadways in the project vicinity such as Pole Line Road, F Street, and East Covell Boulevard. The Proposed Project and the BRPA also both include the construction of a new bus stop on East Covell Boulevard at L Street. The project vicinity is served by Unitrans Routes E, F, L, P, Q, and T, which serve a variety of retail, employment, medical, institutional, and recreational destinations throughout the City and on the UC Davis campus, as well as Yolobus Route 43, which provides commute bus service for Davis residents who work in Downtown Sacramento. Therefore, the Proposed Project and BRPA would be generally consistent with Action TR.5, and, while not directly applicable to the Proposed Project or the BRPA, would generally be consistent with the goals Citywide Actions TR.3, TR.4, TR.6, and TR.7.

Finally, with regard to Action AD.2, which aims to expand urban forest in parks, greenbelts, and open space with climate-ready species that provide shade, the Proposed Project and the BRPA would include a total of approximately 186.0 acres and approximately 186.3 acres, respectively, of parks, open space, and greenbelts, including the Heritage Oak Park and Village Trails Park, and natural vegetation areas along Channel A (including the agricultural buffer). With the exception of the UATA, which is not anticipated to be planted with a significant number of trees, trees would be planted throughout such areas, in accordance with City requirements. In addition, an oak grove would be included in the 20.3-acre Heritage Oak Park as part of both the Proposed Project and the BRPA. Therefore, the Proposed Project would be generally consistent with Action AD.2.

It should also be noted that while, as discussed above, several actions included in the CAAP are related to implementation of future citywide policies and programs that have not yet been developed within the City, the Proposed Project and the BRPA would include several design features that would generally be consistent with the goals of such actions. For example, although the modeling does not assume any on-site solar, the Proposed Project and the BRPA would both be built in compliance with the requirements of the CalGreen Tier 1 standards, as required by Section 8.01.090 of the Municipal Code, and would include the provision of on-site renewable energy as well as EV charging infrastructure, generally consistent with the goals of Actions BE.3, TR.10, and AD.1. In addition, the Proposed Project and the BRPA would integrate Low Impact Development (LID) measures and volume-based best management practices such as bioretention, infiltration features, and pervious pavement, and flow-based best management practices, such as vegetated swales and stormwater planters throughout the site to provide stormwater quality treatment, consistent with the City of Davis Storm Water Quality Control Standards, generally consistent with the goals of Action AD.3. With regard to on-site landscaping improvements, the Proposed Project and the BRPA would be required to select a plant palette that includes a mix of native, drought-tolerant, climate-ready, and carbon-capturing qualities associated with the new trees, shrubs, and seasonal grasses, generally consistent with the goals of Action WW.1. Finally, as discussed in Chapter 4.6, Transportation, of this EIR, the Proposed Project and the BRPA would both implement a series of TDM strategies, as recommended by the California Air Pollution Control Officers Association (CAPCOA) Handbook for Assessing GHG Emission Reductions, Climate Vulnerabilities, and Health and Equity (December 2021), to reduce project-generated VMT to the maximum extent feasible, generally consistent with the goals of Action TR.11.

Therefore, implementation of the Proposed Project/BRPA would be consistent with the overarching goal of the CAAP, which is to reduce GHG emissions.

Conclusion

Based on the above, implementation of both the Proposed Project and the BRPA could generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHG, and both the Proposed Project's and BRPA's incremental contribution to this significant cumulative impact would be ***cumulatively considerable***.

Mitigation Measure(s)

Implementation of Mitigation Measures 4.3-8 would achieve a downward trajectory of operational GHG emissions, assuming an equal-level reduction per year sufficient to reach zero $MTCO_2e$/yr by 2040. Mitigation Measure 4.3-8 would assure that implementation of the Proposed Project/BRPA would not result in long-term operational impacts related to GHG emissions or the creation of conflicts with an applicable regulation. However, due to uncertainties related to the potential efficacy and feasibility of the GHG reductions measures, as well as the availability of off-site carbon credit programs, the full GHG reductions associated with the Proposed Project or the BRPA cannot be guaranteed at this time. Therefore, the impact would remain *cumulatively considerable* and *significant and unavoidable*.

Proposed Project, Biological Resources Preservation Alternative

4.3-8 *The project proponent shall prepare and implement a GHG Reduction Plan, to the satisfaction of the City, to demonstrate a downward trajectory in GHG emissions, towards the goal of zero net GHG emissions by the year 2040. Prior to the approval of the entitlement for each phase of the Proposed Project or the BRPA, the project proponent shall indicate how to complete and implement the following steps:*

1. *Model net non-mobile operational GHG emissions using CalEEMod, or another method accepted for the purpose of modeling GHG emissions for the Proposed Project or the BRPA, taking into account applicable building standards and other regulatory requirements, as well as building design, use of renewable energy, etc. The updated modeling shall take into account any updated project design measures incorporated in compliance with this mitigation measure or as proposed in future project design details.*
2. *Based on the construction and operational schedules proposed at the time of building permitting, the modeled emissions shall be compared to the maximum permitted emissions for the first year of occupancy, based on the applicable Table below:*

Proposed Project		
Year	**Maximum Permitted Net Project Emissions ($MTCO_2e$)**	**Emissions Reductions Achieved ($MTCO_2e$)**
2033	18,160.00	0.00
2034	15,565.71	2,594.29
2035	12,971.43	5,188.57
2036	10,377.14	7,782.86
2037	7,782.86	10,377.14
2038	5,188.57	12,971.43
2039	2,594.29	15,565.71

2040	0.00	18,160.00
Total Emissions Reductions		*72,640.00*

BRPA		
Year	**Maximum Permitted Net Project Emissions ($MTCO_2e$)**	**Emissions Reductions Achieved ($MTCO_2e$)**
2033	19,206.00	0.00
2034	16,462.29	2,743.71
2035	13,718.57	5,487.43
2036	10,974.86	8,231.14
2037	8,231.14	10,974.86
2038	5,487.43	13,718.57
2039	2,743.71	16,462.29
2040	0.00	19,206.00
Total Emissions Reductions		*76,824.00*

3. *Should net operational emissions be shown to exceed the maximum emissions levels presented in the applicable table above, the project applicant shall identify feasible actions to achieve sufficient emissions reductions for the year or years being modeled. Reduction measures may include, but are not limited to:*
    - *Use of energy-star appliances in all or part of the project;*
    - *Installation of on-site photovoltaic systems in excess of the City's or State standards in place at the time of this environmental analysis;*
    - *Construct on-site or fund off-site carbon sequestration projects (such as tree plantings or reforestation projects);*
    - *Implement Transportation Demand Management strategies, such as CAPCOA Handbook Strategy T-16 and T-20-A, in accordance with Mitigation Measure 4.13-4 of this EIR;*
    - *Provide electric vehicle charging infrastructure in excess of existing Tier 1 CBSC requirements; and/or*
        - *Purchase carbon credits to offset project annual emissions. Carbon offset credits shall be verified and registered with The Climate Registry, the Climate Action Reserve, or another source approved by CARB, YSAQMD, or the City of Davis. Off-site mitigation credits shall be real, quantifiable, permanent, verifiable, enforceable, and additional, consistent with the standards set*

forth in Health and Safety Code Section 38562, subdivisions (d)(1) and (d)(2). The offsets shall be retired, and emissions must be offset through the year 2045. Such credits shall be based on CARB-approved protocols that are consistent with the criteria set forth in subdivision (a) of Section 95972 of Title 17 of the CCR, and shall not allow the use of offset projects originating outside of California, except to the extent that the quality of the offsets, and their sufficiency under the standards set forth herein, can be verified by the City of Davis and/or the YSAQMD. Such credits must be purchased through one of the following: (i) a CARB-approved registry, such as the Climate Action Reserve, the American Carbon Registry, and the Verified Carbon Standard; (ii) any registry approved by CARB to act as a registry under the California Cap and Trade program; or (iii) any registry established by YSAQMD.

4. *The emissions reductions resulting from implementation of the above measures shall be calculated, using methods acceptable to the City.*
5. *Proof of compliance with the maximum annual net emissions targets and the steps above shall be verified through the submittal of a Technical Memorandum of Compliance (TMC) to the City of Davis Department of Community Development. The TMC shall document the following minimum items: modeling (step 1); comparison of modeled emissions to maximum emissions levels identified in Mitigation Measure 4.3-8(a) (step 2); chosen feasible actions to achieve required reductions (step 3); and measurable GHG reduction value of each action (step 4). TMCs prepared in compliance with the foregoing steps may cover individual operational years or multiple operational years. Should a TMC be prepared for multiple operational years, the TMC shall demonstrate compliance with the maximum emissions levels for each year included in the TMC.*
6. *Implement the authorized actions and provide evidence of this to the City of Davis Department of Community Development. The City upon review and acceptance of implementation, shall issue the certificate of occupancy.*

4.3-9 Result in a cumulatively considerable inefficient or wasteful consumption of energy or conflict with a State or local plan for renewable energy or energy efficiency. Based on the analysis below, the cumulative impact is *less than significant*.

The following includes a discussion of cumulative impacts related to energy use associated with both the Proposed Project and the BRPA.

Proposed Project, Biological Resources Preservation Alternative

Impact 4.3-5 discusses the energy demand on a project-level associated with both the Proposed Project and the BRPA, within the context of existing State plans and regulations, as well as local plans. As discussed previously, the Proposed Project/BRPA would involve consumption of diesel, gasoline, and electricity throughout construction and operations. However, all proposed structures would be built in compliance with existing statewide mandatory energy efficiency standards, such as those contained in the California Building Energy Efficiency Standards and the CALGreen Code. In addition, similar to the Proposed Project/BRPA, as required by Section 8.01.090 of the Municipal Code, all future development within the City of Davis would be required to comply with Tier 1 standards of the CALGreen Code, which would otherwise be voluntary under the CBSC. Future development would also be subject to the requirements included in Sections 8.01.060, 8.01.100, and 8.01.110 of the Municipal Code, and all applicable CAAP measures related to energy demand, as discussed in the Regulatory Context section, above. Compliance with the energy efficiency standards would reduce the amount of electricity consumed by the proposed development. State regulations would also help to reduce the amount of energy consumed by on-road vehicles over time. For instance, State and federal emissions standards and fuel economy standards result in increased fuel efficiency for on-road vehicles. Overall, as concluded above, the Proposed Project/BRPA would result in a less-than-significant impact related to the inefficient or wasteful use of energy or conflicting with a State or local plan for renewable energy or energy efficiency.

Similar to the Proposed Project/BRPA, all future development within the City of Davis would be required to comply with applicable State and local regulations related to energy efficiency. Increased efficiency would be ensured in the future as cumulative development occurs due to compliance with the State's robust energy efficiency requirements. For example, the 2022 CBSC and the 2022 Building Energy Efficiency Standards require that newly constructed residential and non-residential buildings, including grocery stores, offices, financial institutions, unleased tenant space, retail space, schools, warehouses, auditoriums, convention centers, hotel/motels, libraries, medical office building/clinics, and theaters install a solar PV system. Furthermore, energy efficiency regulations have been getting progressively more stringent over time. Thus, as cumulative development occurs under the increasingly stringent regulations, the energy use associated with such cumulative development is anticipated to be increasingly energy efficient over time as well.

Based on the above, implementation of the Proposed Project/BRPA, in combination with other cumulative development, would not result in the wasteful or inefficient use of energy. Because the Proposed Project/BRPA would not conflict with a local plan to

increase energy efficiency and reduce energy consumption, a ***less-than-significant*** cumulative impact would occur.

Mitigation Measure(s)

None required.