3.3 - Air Quality

3.3.1 - Introduction

This section describes the existing air quality setting and potential effects from project implementation on the site and its surrounding area. Michael Brandman Associates performed air quality analysis for the proposed project, which included construction and operational air quality modeling. URBEMIS 2007 Version 9.2.4 was used to quantify project related emissions. The air quality analysis, including model output, is provided in Appendix C.

3.3.2 - Environmental Setting

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

The SVAB is further divided into two planning areas: the Broader Sacramento Area that consists of the southern (more populated) portion of the SVAB, and the Upper Sacramento Valley. The project is located in the Broader Sacramento Area portion of the SVAB.

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

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

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

south. Essentially, this phenomenon causes the air pollutants to be blown south toward the Air District. This phenomenon has the effect of exacerbating the pollution levels in the area and increases the likelihood of violating federal or state standards. The eddy normally dissipates around noon when the delta sea breeze arrives.

Local Air Quality

The local air quality can be evaluated by reviewing relevant air pollution concentrations near the project area. The two ambient air monitoring stations nearest the project sites are the Woodland monitoring station located approximately 3 miles southeast of the Beamer/Cottonwood site, and the UC Davis monitoring station located approximately 5 miles northwest of the Grasslands site. Table 3.3-1 summarizes 2009 through 2011 published monitoring data, which is the most recent 3-year period available. The data shows that during the past few years, the project area has exceeded the ozone, PM_{10}, and $PM_{2.5}$ standards.

Table 3.3-1: Air Quality Monitoring Summary

Air Pollutant	Averaging Time	Item	2009	2010	2011
Ozone[1]	1 Hour	Max 1 Hour (ppm)	0.093	0.087	0.088
		Days > State Standard (0.09 ppm)	0	0	0
	8 Hour	Max 8 Hour (ppm)	0.082	0.069	0.072
		Days > State Standard (0.07 ppm)	11	0	2
		Days > National Standard (0.075 ppm)	3	0	0
Nitrogen dioxide[2]	Annual	Annual Average (ppm)	0.007	0.006	0.007
	1 Hour	Max 1 Hour (ppm)	0.040	0.037	0.043
		Days > State Standard (0.18 ppm)	0	0	0
Inhalable coarse particles[1] (PM_{10})	Annual	Annual Average ($\mu g/m^3$)	21.1	18.8	19.1
	24 hour	Max 24 Hour ($\mu g/m^3$)	64.0	87.4	56.6
		Est. Days > State Standard (50 $\mu g/m^3$)	12.2	6.5	6.1
		Est. Days > National Standard (150 $\mu g/m^3$)	0	0	0
Fine particulate matter[1] ($PM_{2.5}$)	Annual	Annual Average ($\mu g/m^3$)	7.5	5.6	*
	24 Hour	Max 24 Hour ($\mu g/m^3$)	27.6	26.7	39.4
		Est. Days > National Standard (35 $\mu g/m^3$)	0.0	0.0	*

Notes and Abbreviations:
> = exceed ppm = parts per million $\mu g/m^3$ = micrograms per cubic meter
max = maximum Est. = Estimated * = insufficient data or no data
State Standard = California Ambient Air Quality Standard
National Standard = National Ambient Air Quality Standard
[1] From the Woodland monitoring station
[2] From the UC Davis monitoring station
Source: California Air Resources Board 2012.

Sensitive Receptors

Those who are sensitive to air pollution include children, the elderly, and persons with pre-existing respiratory or cardiovascular illness. For purposes of CEQA, the Air District considers a sensitive receptor a location that houses or attracts children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Examples of sensitive receptors include hospitals, residences, convalescent facilities, and schools.

Grasslands Site

The nearest sensitive receptor to the project is an existing residence located southwest of the project boundary across Mace Boulevard. The residence is located approximately 110 feet west of the project boundary, and approximately 360 feet southwest of the solar facility.

Beamer/Cottonwood Site

The nearest sensitive receptors to the project are residences located adjacent to the project site to the west (across Ashley Drive) and north (across Woodland Avenue). In addition, the following sensitive receptors have been identified (all distances are approximate):

- Schools
  - Rhoda Maxwell Elementary School and Greengate School: 0.16 mile south of project
  - Woodland High School: 0.33 mile east of project

Attainment Status

The EPA and the ARB designate air basins where ambient air quality standards are exceeded as "nonattainment" areas. If standards are met, the area is designated an "attainment" area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." National nonattainment areas are further designated marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or "form" of what constitutes attainment, based on specific air quality statistics. For example, the federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the federal annual $PM_{2.5}$ standard is met if the 3-year average of the annual average $PM_{2.5}$ concentration is less than or equal to the standard.

The current attainment designations for the Air Basin are shown in Table 3.3-2. The project area is designated nonattainment for the state and federal ozone and $PM_{2.5}$ standards and the PM_{10} state standards. The project is located in an area identified as the Sacramento Federal Nonattainment Area. The federal 8-hour ozone attainment deadline for the Sacramento Federal Nonattainment Area is June 15, 2013. Additionally, the area is designated as nonattainment for both the 1-hour and 8-hour state ozone standards.

Table 3.3-2: Yolo County Attainment Status

Pollutant	Designation	
	State	Federal
Ozone – 1-hour	Nonattainment	No Federal Standard
Ozone – 8-hour	Nonattainment	Nonattainment
Carbon monoxide	Attainment	Unclassified/Attainment
Nitrogen dioxide	Attainment	Attainment
Sulfur dioxide	Attainment	Attainment
PM_{10}	Nonattainment	Unclassified
$PM_{2.5}$ – 24-hour	Unclassified	Partial Nonattainment
$PM_{2.5}$ – Annual	Unclassified	Attainment
Lead	Attainment	Attainment
Hydrogen sulfide	Attainment	No Federal Standard
Sulfates	Attainment	No Federal Standard
Vinyl chloride	Attainment	No Federal Standard
Visibility reducing particles	Attainment	No Federal Standard
Source: Yolo-Solano Air Quality Management District 2012. California Air Resources Board 2011.		

3.3.3 - Regulatory Framework

Air pollutants are regulated at the national, state, and air basin level; each agency has a different level of regulatory responsibility. The United States Environmental Protection Agency (EPA) regulates at the national level. The California Air Resources Board (ARB) regulates at the state level. The Air District regulates at the regional level.

National and State

The EPA is responsible for national and interstate air pollution issues and policies. The EPA sets national vehicle and stationary source emission standards, oversees approval of all State Implementation Plans, provides research and guidance for air pollution programs, and sets National Ambient Air Quality Standards, also known as federal standards. There are federal standards for six common air pollutants, called criteria air pollutants, which were identified from provisions of the Clean Air Act of 1970. The criteria pollutants are:

- Ozone
- Nitrogen dioxide
- Lead
- Particulate matter (PM_{10} and $PM_{2.5}$)
- Carbon monoxide (CO)
- Sulfur dioxide

The federal standards were set to protect public health, including that of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of

the criteria pollutants. Primary federal standards are the levels of air quality necessary, with an adequate margin of safety, to protect the public health (California Air Resources Board 2012).

A State Implementation Plan is a document prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain federal standards. The State Implementation Plan for the State of California is administered by the ARB, which has overall responsibility for statewide air quality maintenance and air pollution prevention. California's State Implementation Plan incorporates individual federal attainment plans for regional air districts—air district prepares their federal attainment plan, which sent to ARB to be approved and incorporated into the California State Implementation Plan. Federal attainment plans include the technical foundation for understanding air quality (e.g., emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms.

The ARB also administers California Ambient Air Quality Standards (state standards) for the 10 air pollutants designated in the California Clean Air Act. The 10 state air pollutants are the six federal standards listed above as well visibility-reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride.

The federal and state ambient air quality standards, relevant effects, properties, and sources of the pollutants are summarized in Table 3.3-3.

Table 3.3-3: Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Ozone	1 Hour	0.09 ppm	—	Irritate respiratory system; reduce lung function; breathing pattern changes; reduction of breathing capacity; inflame and damage cells that line the lungs; make lungs more susceptible to infection; aggravate asthma; aggravate other chronic lung diseases; cause permanent lung damage; some immunological changes; increased mortality risk; vegetation and property damage.	Ozone is a photochemical pollutant as it is not emitted directly into the atmosphere, but is formed by a complex series of chemical reactions between volatile organic compounds (VOC), NO_x, and sunlight. Ozone is a regional pollutant that is generated over a large area and is transported and spread by the wind.	Ozone is a secondary pollutant; thus, it is not emitted directly into the lower level of the atmosphere. The primary sources of ozone precursors (VOC and NO_x) are mobile sources (on-road and off-road vehicle exhaust).
	8 Hour	0.070 ppm	0.075 ppm			
Carbon monoxide (CO)	1 Hour	20 ppm	35 ppm	Ranges depending on exposure: slight headaches; nausea; aggravation of angina pectoris (chest pain) and other aspects of coronary heart disease; decreased exercise tolerance in persons with peripheral vascular disease and lung disease; impairment of central nervous system functions; possible increased risk to fetuses; death.	CO is a colorless, odorless, toxic gas. CO is somewhat soluble in water; therefore, rainfall and fog can suppress CO conditions. CO enters the body through the lungs, dissolves in the blood, replaces oxygen as an attachment to hemoglobin, and reduces available oxygen in the blood.	CO is produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). Sources include motor vehicle exhaust, industrial processes (metals processing and chemical manufacturing), residential wood burning, and natural sources.
	8 Hour	9.0 ppm	9 ppm			
Nitrogen dioxide[b] (NO_2)	1 Hour	0.18 ppm	0.100 ppm	Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; contribution to atmospheric discoloration; increased visits to hospital for respiratory illnesses.	During combustion of fossil fuels, oxygen reacts with nitrogen to produce nitrogen oxides - NO_x (NO, NO_2, NO_3, N_2O, N_2O_3, N_2O_4, and N_2O_5). NO_x is a precursor to ozone, PM_{10}, and $PM_{2.5}$ formation. NO_x can react with compounds to form nitric acid and related small particles and result in PM related health effects.	NO_x is produced in motor vehicle internal combustion engines and fossil fuel-fired electric utility and industrial boilers. NO_2 concentrations near major roads can be 30 to 100 percent higher than those at monitoring stations.
	Annual	0.030 ppm	0.053 ppm			

Table 3.3-3 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Sulfur dioxide[c] (SO_2)	1 Hour	0.25 ppm	0.075 ppm	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient sulfur dioxide levels. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.	Sulfur dioxide is a colorless, pungent gas. At levels greater than 0.5 ppm, the gas has a strong odor, similar to rotten eggs. Sulfur oxides (SO_x) include sulfur dioxide and sulfur trioxide. Sulfuric acid is formed from sulfur dioxide, which can lead to acid deposition and can harm natural resources and materials. Although sulfur dioxide concentrations have been reduced to levels well below state and federal standards, further reductions are desirable because sulfur dioxide is a precursor to sulfate and PM_{10}.	Human caused sources include fossil-fuel combustion, mineral ore processing, and chemical manufacturing. Volcanic emissions are a natural source of sulfur dioxide. The gas can also be produced in the air by dimethylsulfide and hydrogen sulfide. Sulfur dioxide is removed from the air by dissolution in water, chemical reactions, and transfer to soils and ice caps. The sulfur dioxide levels in the State are well below the maximum standards.
	3 Hour	—	0.5 ppm			
	24 Hour	0.04 ppm	0.14 (for certain areas)			
	Annual	—	0.030 ppm (for certain areas)			
Particulate matter (PM_{10})	24 hour	50 µg/m^3	150 µg/m^3	Short-term exposure (hours/days): irritation of the eyes, nose, throat; coughing; phlegm; chest tightness; shortness of breath; aggravate existing lung disease, causing asthma attacks and acute bronchitis; those with heart disease can suffer heart attacks and arrhythmias. Long-term exposure: reduced lung function; chronic bronchitis; changes in lung morphology; death.	Suspended particulate matter is a mixture of small particles that consist of dry solid fragments, droplets of water, or solid cores with liquid coatings. The particles vary in shape, size, and composition. PM_{10} refers to particulate matter that is between 2.5 and 10 microns in diameter, (1 micron is one-millionth of a meter). $PM_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter.	Stationary sources include fuel combustion for electrical utilities, residential space heating, and industrial processes; construction and demolition; metals, minerals, and petrochemicals; wood products processing; mills and elevators used in agriculture; erosion from tilled lands; waste disposal, and recycling. Mobile or transportation-related sources are from vehicle exhaust and road dust.
	Mean	20 µg/m^3	—			
Particulate matter ($PM_{2.5}$)	24 Hour	—	35 µg/m^3			
	Annual	12 µg/m^3	15 µg/m^3			
Visibility reducing particles	8 Hour	See note below[d]				
Sulfates	24 Hour	25 µg/m^3	—	(a) Decrease in ventilatory function; (b) aggravation of asthmatic symptoms; (c) aggravation of cardio-pulmonary disease; (d) vegetation damage; (e) degradation of visibility; (f) property damage.	The sulfate ion is a polyatomic anion with the empirical formula SO_4^{2-}. Sulfates occur in combination with metal and/or hydrogen ions. Many sulfates are soluble in water.	Sulfates are particulates formed through the photochemical oxidation of sulfur dioxide. In California, the main source of sulfur compounds is combustion of gasoline and diesel fuel.

Table 3.3-3 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Lead[e]	30-day	1.5 µg/m^3	—	Lead accumulates in bones, soft tissue, and blood and can affect the kidneys, liver, and nervous system. It can cause impairment of blood formation and nerve conduction, behavior disorders, mental retardation, neurological impairment, learning deficiencies, and low IQs.	Lead is a solid heavy metal that can exist in air pollution as an aerosol particle component. Leaded gasoline was used in motor vehicles until around 1970. Lead concentrations have not exceeded state or federal standards at any monitoring station since 1982.	Lead ore crushing, lead-ore smelting, and battery manufacturing are currently the largest sources of lead in the atmosphere in the United States. Other sources include dust from soils contaminated with lead-based paint, solid waste disposal, and crustal physical weathering.
	Quarter	—	1.5 µg/m^3			
	Rolling 3-month average	—	0.15 µg/m^3			
Vinyl chloride [e]	24 Hour	0.01 ppm	—	Short-term exposure to high levels of vinyl chloride in the air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Epidemiological studies of occupationally exposed workers have linked vinyl chloride exposure to development of a rare cancer, liver angiosarcoma, and have suggested a relationship between exposure and lung and brain cancers.	Vinyl chloride, or chloroethene, is a chlorinated hydrocarbon and a colorless gas with a mild, sweet odor. In 1990, ARB identified vinyl chloride as a toxic air contaminant and estimated a cancer unit risk factor.	Most vinyl chloride is used to make polyvinyl chloride plastic and vinyl products, including pipes, wire and cable coatings, and packaging materials. It can be formed when plastics containing these substances are left to decompose in solid waste landfills. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites.
Hydrogen sulfide	1 Hour	0.03 ppm	—	High levels of hydrogen sulfide can cause immediate respiratory arrest. It can irritate the eyes and respiratory tract and cause headache, nausea, vomiting, and cough. Long exposure can cause pulmonary edema.	Hydrogen sulfide (H_2S) is a flammable, colorless, poisonous gas that smells like rotten eggs.	Manure, storage tanks, ponds, anaerobic lagoons, and land application sites are the primary sources of hydrogen sulfide. Anthropogenic sources include the combustion of sulfur containing fuels (oil and coal).
Volatile organic compounds (VOC)		There are no state or federal standards for VOCs because they are not classified as criteria pollutants.		Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations because of interference with oxygen uptake. In general, concentrations of VOCs	Reactive organic gases (ROGs), or VOCs, are defined as any compound of carbon—excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate—that participates in	Indoor sources of VOCs include paints, solvents, aerosol sprays, cleansers, tobacco smoke, etc. Outdoor sources of VOCs are from combustion and fuel evaporation. A reduction in VOC emissions reduces certain chemical reactions

Table 3.3-3 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
				are suspected to cause eye, nose, and throat irritation; headaches; loss of coordination; nausea; and damage to the liver, the kidneys, and the central nervous system. Many VOCs have been classified as toxic air contaminants.	atmospheric photochemical reactions. Although there are slight differences in the definition of ROGs and VOCs, the two terms are often used interchangeably.	that contribute to the formulation of ozone. VOCs are transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} and lower visibility.
Benzene		There are no ambient air quality standards for benzene.		Short-term (acute) exposure of high doses from inhalation of benzene may cause dizziness, drowsiness, headaches, eye irritation, skin irritation, and respiratory tract irritation, and at higher levels, loss of consciousness can occur. Long-term (chronic) occupational exposure of high doses has caused blood disorders, leukemia, and lymphatic cancer.	Benzene is a VOC. It is a clear or colorless light-yellow, volatile, highly flammable liquid with a gasoline-like odor. The EPA has classified benzene as a "Group A" carcinogen.	Benzene is emitted into the air from fuel evaporation, motor vehicle exhaust, tobacco smoke, and from burning oil and coal. Benzene is used as a solvent for paints, inks, oils, waxes, plastic, and rubber. Benzene occurs naturally in gasoline at 1 to 2 percent by volume. The primary route of human exposure is through inhalation.
Diesel particulate matter (DPM)		There are no ambient air quality standards for DPM.		Some short-term (acute) effects of DPM exposure include eye, nose, throat, and lung irritation, coughs, headaches, light-headedness, and nausea. Studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems. Human studies on the carcinogenicity of DPM demonstrate an increased risk of lung cancer, although the increased risk cannot be clearly attributed to diesel exhaust exposure.	DPM is a source of $PM_{2.5}$—diesel particles are typically 2.5 microns and smaller. Diesel exhaust is a complex mixture of thousands of particles and gases that is produced when an engine burns diesel fuel. Organic compounds account for 80 percent of the total particulate matter mass, which consists of compounds such as hydrocarbons and their derivatives, and polycyclic aromatic hydrocarbons and their derivatives. Fifteen polycyclic aromatic hydrocarbons are confirmed carcinogens, a number of which are found in diesel exhaust.	Diesel exhaust is a major source of ambient particulate matter pollution in urban environments. Typically, the main source of DPM is from combustion of diesel fuel in diesel-powered engines. Such engines are in on-road vehicles such as diesel trucks, off-road construction vehicles, diesel electrical generators, and various pieces of stationary construction equipment.

Table 3.3-3 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources

Notes:
ppm = parts per million (concentration) $\mu g/m^3$ = micrograms per cubic meter Annual = Annual Arithmetic Mean 30-day = 30-day average Quarter = Calendar quarter

[a] Federal standard refers to the primary national ambient air quality standard, or the levels of air quality necessary, with an adequate margin of safety to protect the public health. All standards listed are primary standards except for 3 Hour SO_2, which is a secondary standard. A secondary standard is the level of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[b] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (0.100 ppm).

[c] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[d] Visibility reducing particles: In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

[e] The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Source of effects: South Coast Air Quality Management District 2003 and 2007b; California Environmental Protection Agency 2002; California Air Resources Board 2009; U.S. Environmental Protection Agency 2009a, 2010, and 2012; National Toxicology Program 2011a.
Source of standards: California Air Resources Board 2012.
Source of properties and sources: U.S. Environmental Protection Agency 2009a; U.S. Environmental Protection Agency 2003; U.S. Environmental Protection Agency 2011b; U.S. Environmental Protection Agency 2009b; National Toxicology Program 2011b.

Several pollutants listed in Table 3.3-3 are not addressed in this analysis. Analysis of lead is not included in this analysis because the project is not anticipated to emit lead. Visibility-reducing particles are not explicitly addressed in this analysis because particulate matter is addressed. The project is not expected to generate or be exposed to vinyl chloride because proposed project uses do not utilize the chemical processes that create this pollutant and there are no such uses in the project vicinity. The proposed project is not expected to cause exposure to hydrogen sulfide because it would not generate hydrogen sulfide in any substantial quantity.

Asbestos

Asbestos is listed as a toxic air contaminant by ARB and as a Hazardous Air Pollutant by the EPA. Asbestos occurs naturally in surface deposits of several types of rock formations. Asbestos most commonly occurs in ultramafic rock that has undergone partial or complete alteration to serpentine rock (serpentinite) and often contains chrysotile asbestos. In addition, another form of asbestos, tremolite, can be found associated with ultramafic rock, particularly near faults. Crushing or breaking these rocks, through construction or other means, can release asbestoform fibers into the air. Asbestos emissions can result from the sale or use of asbestos-containing materials, road surfacing with such materials, grading activities, and surface mining. The risk of disease is dependent upon the intensity and duration of exposure. When inhaled, asbestos fibers may remain in the lungs and with time may be linked to such diseases as asbestosis, lung cancer, and mesothelioma.

The nearest location of naturally occurring asbestos is west of Lake Berryessa, more than 25 miles from either project site (U.S. Geological Survey 2011).

Toxic Air Contaminants

A toxic air contaminant (TAC) is defined as an air pollutant that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. The California Almanac of Emissions and Air Quality presents the relevant concentration and cancer risk data for the ten TACs that pose the most substantial health risk in California based on available data. These TACs are as follows: acetaldehyde, benzene, 1.3-butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and diesel particulate matter (DPM).

State of California

Carl Moyer Memorial Air Quality Standards Attainment Program. Since 1998, the Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) has provided funding to encourage the voluntary purchase of cleaner engines, equipment, and emission reduction technologies. The Carl Moyer Program plays a complementary role to California's regulatory program by funding emission reductions that are surplus, i.e., early and/or in excess of what is required by regulation. The Carl Moyer Program accelerates the turnover of old highly polluting

engines, speeds the commercialization of advanced emission controls, and reduces air pollution impacts on environmental justice communities. Emission reductions achieved through the Carl Moyer Program are an important component of the California State Implementation Plan.

Airborne Toxic Control Measure for Diesel Particulate Matter from Portable Engines Rated at 50 horsepower and Greater. Effective February 19, 2011, each fleet shall comply with weighted reduced particulate matter emission fleet averages by compliance dates listed in the regulation.

ARB Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling adopts new section 2485 within Chapter 10, Article 1, Division 3, title 13 in the California Code of Regulations. The measure limits the idling of diesel vehicles to reduce emissions of toxics and criteria pollutants. The driver of any vehicle subject to this section: (1) shall not idle the vehicle's primary diesel engine for greater than five minutes at any location; and (2) shall not idle a diesel-fueled auxiliary power system for more than five minutes to power a heater, air conditioner, or any ancillary equipment on the vehicle if it has a sleeper berth and the truck is located within 100 feet of a restricted area (homes and schools).

ARB Final Regulation Order, Requirements to Reduce Idling Emissions from New and In-Use Trucks requires that new 2008 and subsequent model-year heavy-duty diesel engines be equipped with an engine shutdown system that automatically shuts down the engine after 300 seconds of continuous idling operation once the vehicle is stopped, the transmission is set to "neutral" or "park," and the parking brake is engaged. If the parking brake is not engaged, then the engine shutdown system shall shut down the engine after 900 seconds of continuous idling operation once the vehicle is stopped and the transmission is set to "neutral" or "park." Any project trucks manufactured after 2008 would be consistent with this rule, which would ultimately reduce air emissions.

ARB Regulation for In-Use Off-Road Diesel Vehicles. On July 26, 2007, the ARB adopted a regulation to reduce diesel particulate matter and NO_x emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. Such vehicles are used in construction, mining, and industrial operations. The regulation limits idling to no more than five consecutive minutes, requires reporting and labeling, and requires disclosure of the regulation upon vehicle sale. The ARB is enforcing that part of the rule with fines up to $10,000 per day for each vehicle in violation. Performance requirements of the rule are based on a fleet's average NO_x emissions, which can be met by replacing older vehicles with newer, cleaner vehicles or by applying exhaust retrofits. The regulation was amended in 2010 to delay the original timeline of the performance requirements making the first compliance deadline January 1, 2014 for large fleets (over 5,000 horsepower), 2017 for medium fleets (2,501-5,000 horsepower), and 2019 for small fleets (2,500 horsepower or less).

Statewide Truck and Bus Rule. On December 12, 2008, the ARB approved this regulation to reduce emissions from existing on-road diesel trucks and buses operating in California. This regulation applies to all on-road heavy-duty diesel-fueled vehicles with a gross vehicle weight rating

greater than 14,000 pounds, agricultural yard trucks with off-road certified engines, and certain diesel fueled shuttle vehicles of any gross vehicle weight rating. Out-of-state trucks and buses that operate in California are also subject. Under the regulation, older, heavier trucks, i.e. those with pre-2000 year engines and a gross vehicle weight rating greater than 26,000 pounds, are required to have installed a particulate matter filter and must be replaced with a 2010 engine between 2015 and 2020, depending on the model year. By 2015, all heavier pre-1994 trucks must be upgraded to 2010 engines and newer trucks are thereafter required to be replaced over the next 8 years. Older, more polluting trucks are required to be replaced first, while trucks that already have relatively clean 2007-2009 engines are not required to be replaced until 2023. Lighter trucks (14,001-26,000 pounds) must adhere to a similar schedule, and will all be replaced by 2020. Furthermore, nearly all trucks that are not required under the Truck and Bus Regulation to be replaced by 2015 are required to be upgraded with a particulate matter filter by that date.

Yolo-Solano Air Quality Management District

The Air District is responsible for controlling emissions primarily from stationary sources. It maintains air quality monitoring stations throughout the basin. The Air District, in coordination with the adjacent air districts and countywide transportation agencies, is also responsible for developing, updating, and implementing air quality attainment plans for the Sacramento Federal Nonattainment Area.

Federal Air Quality Attainment Plans

The federal nonattainment plan for the Sacramento Federal Nonattainment Area is the 1994 Sacramento Area Regional Ozone Attainment Plan. The five air districts that comprise the Sacramento Federal Nonattainment area are the Sacramento Metropolitan Air Quality Management District, the Feather River Air Quality Management District, the Placer County Air Pollution Control District, the Yolo Solano Air Quality Management District, and the El Dorado County Air Quality Management Districts. The air districts of the Sacramento region adopted a Rate of Progress (ROP) Plan for the federal 8-hour ozone standard in 2006.

In addition, the districts adopted the 2011 Reasonable Further Progress Plan (RFP) for the 8-hour federal ozone standard in April 2008. The RFP shows that the Sacramento region cannot meet the 2013 attainment deadline, and is the basis for the voluntary federal reclassification request, discussed further below.

Voluntary Federal Reclassification Request

The five air districts that comprise the Sacramento Federal Nonattainment Area requested that the ARB submit a formal request to the EPA to reclassify the area from “serious” to “severe” nonattainment for the federal 8-hour ozone standard. The request is based on an evaluation of the emission reductions necessary to attain the federal standard, and the emission reductions associated with feasible rules. It was determined that the Sacramento Federal Nonattainment Area would not be able to achieve the necessary emission reduction in the attainment timeframe through the existing

suite of feasible rules. The ARB submitted the request on February 14, 2008. EPA issued a final rule approving the request from serious to severe non-attainment on May 5, 2010, which extended the attainment deadline to June 15, 2019.

2006 24-Hour $PM_{2.5}$ Standard

EPA assigned non-attainment designations for the 2006 $PM_{2.5}$ standard in November 2009. The Air District was given a designation of "partial nonattainment" and was included as part of a larger $PM_{2.5}$ nonattainment area. The Air District is currently developing an attainment plan for $PM_{2.5}$ with an attainment deadline of December 2014.

State Air Quality Attainment Plans

The CCAA does not contain planning requirements for areas in nonattainment of the state PM_{10} standards, but air districts must demonstrate to the ARB that all feasible measures for their district have been adopted. However, state ozone standards do have planning requirements. The CCAA requires air districts that are nonattainment of the state ozone standards to adopt air quality attainment plans and to review and revise their plans to address deficiencies in interim measures of progress once every 3 years.

The Air District's plan for attaining the state ozone standard is the 1992 Air Quality Attainment Plan (AQAP). The Air District's Governing Board has adopted updates to the original AQAP; The most recent Triennial Plan was adopted in May 2010.

Yolo County

The Yolo County General Plan includes goals and policies that improve air quality, primarily through transportation, transit, and bicycle infrastructure. The Conservation Element contains an air-specific Goal, CO-6, and multiple air-specific policies. The following General Plan policy is directly applicable to the project.

- **Policy CO-6.6:** Encourage implementation of YSAQMD Best Management Practices, such as those listed below, to reduce emissions and control dust during construction activities:
  - Water all active construction areas at least twice daily.
  - Haul trucks shall maintain at least two feet of freeboard.
  - Cover all trucks hauling soil, sand, and other loose materials.
  - Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut-and-fill operations and hydroseed area.
  - Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).
  - Plant tree windbreaks on the windward perimeter of construction projects if adjacent to open land.
  - Plant vegetative ground cover in disturbed areas as soon as possible.
  - Cover inactive storage piles.

- Sweep streets if visible soil material is carried out from the construction site.
- Treat accesses to a distance of 100 feet from the paved road with a 6 to 12 inch layer of wood chips or mulch.
- Treat accesses to a distance of 100 feet from the paved road with a 6-inch layer of gravel.

3.3.4 - Methodology

The methodology follows the Air District's Handbook for Assessing and Mitigating Air Quality Impacts, which sets forth recommended thresholds of significance, analysis methodologies, and provides guidance on mitigating significant impacts.

The URBEMIS 2007 model (version 9.2.4) was used to quantify construction-generated emissions. URBEMIS is a California-specific computer model that is owned and modified by the local air pollution control districts and air quality management districts in the State of California. URBEMIS estimates construction, area source, and operational emissions from potential land uses, using relevant ARB emissions models and emission factors and/or Air District-specific emission factors, and it estimates emissions reductions. URBEMIS is widely used to conduct CEQA-related air quality studies and is recommended for use by the Air District for estimating project emissions.

Detailed methodology is described in each of the impact sections below.

3.3.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, air quality impacts resulting from the implementation of the proposed project would be considered significant if the project would:

> Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.
>
> Would the project:
>
> a.) Conflict with or obstruct implementation of the applicable air quality plan?
>
> b.) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?
>
> c.) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?
>
> d.) Expose sensitive receptors to substantial pollutant concentrations?

e.) Create objectionable odors affecting a substantial number of people? (Refer to Section 7, Effects Found Not To Be Significant.)

3.3.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

Air Quality Attainment Plan Consistency

Impact AIR-1:	**The project would not conflict with or obstruct implementation of the applicable air quality plan.**

Impact Analysis

General Plans of cities and counties must show consistency with the Air District's Air Quality Attainment Plan and State Implementation Plan in order to claim a less than significant impact on air quality. The Air District recommends that general plan amendments, redevelopment plans, specific area plans, annexations of lands and services, and similar planning activities should receive the same level of scrutiny as general plans. If a project is consistent with the assumptions, inputs, and control measures analyzed in a General Plan's Air Quality Attainment Plan consistency determination, then it follows that the project is also consistent with the Air Quality Attainment Plan.

Grasslands Site

The project would not require a change in zoning, general plan designation, or require annexation. In addition, the project would not generate an increase in population or vehicle miles above that anticipated by the applicable general plan. Bus traffic would access the site for educational field trips from K-12 classes in Yolo County., It is unknown if the level of bus traffic from County schools would increase as a result of the project, in other words, if trips would supplant other field trips. However, emissions from anticipated bus trips would be offset by operation of the solar facility, which is anticipated to offset or reduce NO_x generated by fossil-fueled energy generation by 0.54 ton of per year. See Appendix C for NO_x reduction calculations. Therefore, the project is consistent with the General Plan and the Air Quality Attainment Plan.

Beamer/Cottonwood Site

The project would not require a change in zoning, general plan designation, or require annexation. In addition, the project would not generate an increase in population or vehicle miles traveled above that anticipated by the applicable general plan. Therefore, the project is consistent with the General Plan and the Air Quality Attainment Plan.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

Grasslands Site

No mitigation is necessary.

Beamer/Cottonwood Site

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Air Quality Standard Violation

Impact AIR-2:	**The project may violate an air quality standard or contribute substantially to an existing or projected air quality violation.**

Impact Analysis

This impact will assess the potential for project's potential to generate a localized exceedance of any federal or state ambient air quality standard. The localized pollutants of concern for this impact are CO. In addition, this impact assesses the potential for the project to generate a localized fugitive dust (PM_{10}) impact.

Because increased CO concentrations are usually associated with roadways that are congested and with heavy traffic volume, the Air District has established that preliminary screening can be used to determine with fair certainty that the effect a project has on any given intersection would not cause a potential CO hotspot. Therefore, the Air District has established that if all project-affected intersections are negative for both of the following criteria, then the project can be said to have no potential to create a violation of the CO standard, which are 20 ppm and 9 ppm, respectively:

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

If either of the criteria can be associated with any intersection affected by the project, a CO Protocol Analysis must be prepared to determine significance.

For construction, the Air District recommends that fugitive dust (PM_{10}) best management practices measures to be implemented during project construction to reduce dust emissions and avoid localized health impacts (Yolo-Solano Air Quality Management District 2007). Therefore, implementation of

the Air District's fugitive dust best management are considered sufficient to render a project's construction-related fugitive PM_{10} impacts less than significant.

Grasslands Site

CO Hotspot

As further described in Section 7, Effects Found Not To Be Significant, the anticipated number of trips to be generated during project operation are such that the project would be less than the County's Vehicle and Truck Trip Equivalencies for auto and small truck vehicle classifications, even when aggregated together. As such, a traffic impact study is not required, and the project would not significantly impact adjacent roadway operations or the LOS of project-affected intersections. Therefore, operation of the project would be less than the Air District's screening criteria for CO hotspot analysis, and be less than significant for this impact.

Fugitive Dust

Localized PM_{10} would be generated by project construction activities, which would include earth-disturbing activities. A receptor is located approximately 360 feet southwest of the extent of grading activity (solar facility). Therefore, the project may expose the receptor to localized fugitive dust during construction. This impact is considered potentially significant. Implementation of Mitigation Measure AIR-2 would reduce the impact to less than significant.

Beamer/Cottonwood Site

CO Hotspot

As further described in Section 7, Effects Found Not To Be Significant, anticipated number of trips to be generated during project operation are such that the project would be less than the County's Vehicle and Truck Trip Equivalencies for auto and small truck vehicle classifications, even when aggregated together. As such, a traffic impact study is not required, and the project would not significantly impact adjacent roadway operations or the LOS of project-affected intersections. Therefore, operation of the project would be less than the Air District's screening criteria for CO hotspot analysis, and be less than significant for this impact.

Fugitive Dust

Localized PM_{10} would be generated by project construction activities, which would include earth-disturbing activities. Existing neighborhoods are located to the immediate north of the area of grading, as well as west of the project site. Therefore, the project may expose the receptor to localized fugitive dust during construction. This impact is considered potentially significant. Implementation of Mitigation Measure AIR-2 would reduce the impact to less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Grasslands Site

MM AIR-2 The following construction best management practices shall be implemented during earth-moving construction activities:

- Water all active construction sites at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure.
- Plant native grassland ground cover in disturbed areas as soon as possible.
- Sweep streets if visible soil material is carried out from the construction site.
- Treat accesses to a distance of 100 feet from the paved road with a 6-inch layer of gravel.

Beamer/Cottonwood Site

Implement Mitigation Measure AIR-2.

Level of Significance After Mitigation

Less than significant impact.

Cumulatively Considerable Net Increase of Nonattainment Criteria Pollutants

Impact AIR-3:	**The project may result in a cumulatively considerable net increase of criteria pollutants for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors).**

Impact Analysis

This impact assesses the project's potential to generate a cumulatively considerable net increase of criteria pollutants for which the Air Basin is in nonattainment. The Air Basin is in nonattainment for ozone, PM_{10} and $PM_{2.5}$. Ozone is not directly emitted into the air, but is a secondary pollutant formed by the presence of ROG and NO_x in sunlight. Therefore, ROG and NO_x are termed "ozone precursors."

The Air District established significance thresholds for ozone precursors, ROG and NO_x, and PM_{10}. The thresholds apply to both construction and operational emissions. Because the project area is nonattainment for $PM_{2.5}$, and because the Air District does not have adopted thresholds of significance for $PM_{2.5}$, the project would be considered significant for $PM_{2.5}$ if the threshold for PM_{10} is exceeded. The thresholds are:

- 10 tons per year ROG
- 10 tons per year NO_x
- 80 tons per year PM_{10}

Construction of the project would result in the generation of air pollutant emissions. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. Construction emissions result from onsite and offsite

activities. Onsite emissions principally consist of exhaust emissions (NO_x, ROG, PM_{10}, and $PM_{2.5}$) from heavy-duty construction equipment, motor vehicle operation, and fugitive dust (mainly PM_{10}) from disturbed soil. Offsite emissions are caused by motor vehicle exhaust from delivery vehicles, worker traffic, and road dust (PM_{10} and $PM_{2.5}$).

Project construction emissions were estimated using URBEMIS version 9.2.4 and the construction phase types, phase durations and fleet assumptions provided in Section 2, Project Description. The emissions modeling output is provided as Appendix C to this document. The number of equipment and hours of operation were scaled to each project site, as shown in Appendix C.

The Air District provides screening criteria to determine the appropriate level of analysis. For operational ozone and PM_{10}, the Air District provides examples of projects by size and land use type that would likely exceed their thresholds of significance for years 2007 and 2010. Projects falling considerably under these sizes may be safely assumed to need no quantification of ozone precursor or PM_{10} emissions.

Grasslands Site

Construction

Construction annual and daily emissions are provided in Table 3.3-4 and Table 3.3-5, respectively. As shown in the tables, project construction would not exceed the Air District's annual emissions thresholds. However, the project would exceed the Air District's daily threshold for PM_{10} generation. Therefore, construction of the Grasslands site would be potentially significant for both PM_{10} and $PM_{2.5}$. Implementation of Mitigation Measure AIR-2 would reduce PM_{10} and $PM_{2.5}$ emissions to less than significant, as shown in Table 3.3-6.

Table 3.3-4: Grasslands Site Construction Annual Emissions

Source	Emissions (tons)			
	ROG	NO_x	PM_{10}	$PM_{2.5}$
Site Grading and Road Construction	0.01	0.07	0.83	0.18
Trenching	0.00	0.02	0.00	0.00
PV Installation	0.02	0.15	0.01	0.010
Total Annual Emissions	0.03	0.23	0.84	0.19
Air District Threshold	10	10	None	None
Significant?	No	No	No	No

Note:
Totals based on non-rounded emissions.
Source: Michael Brandman Associates, 2012.

Table 3.3-5: Grasslands Site Construction Daily Emissions

Source	Emissions (tons)			
	ROG	NO_x	PM_{10}	$PM_{2.5}$
Site Grading and Road Construction	1.53	12.19	150.64	31.91
Trenching	0.46	2.85	0.24	0.22
PV Installation	0.92	6.58	0.45	0.42
Maximum Daily Emissions	1.53	12.19	150.64	31.91
Air District Threshold	None	None	80	None
Significant?	No	No	Yes	Yes
Note: Phases are assumed to not overlap. Source: Michael Brandman Associates, 2012.				

Table 3.3-6: Grasslands Site Construction Mitigated Daily Emissions

Source	Emissions (tons)			
	ROG	NO_x	PM_{10}	$PM_{2.5}$
Site Grading and Road Construction	1.53	12.19	40.24	8.86
Maximum Daily Emissions	1.53	12.19	40.24	8.86
Air District Threshold	None	None	80	None
Significant?	No	No	No	No
Source: Michael Brandman Associates, 2012.				

Operation

As stated above, the Air District provides screening criteria to determine the appropriate level of analysis. For operational ozone and PM_{10}, the Air District provides examples of projects by size and land use type that would likely exceed their thresholds of significance. Solar projects are not specifically listed as a land use category in the Air District's screening tables. However, the screening tables account for emissions from area and vehicular emissions from project operations; project operational emissions are primarily generated by vehicle traffic traveling to and from a project site. Examples of projects that may exceed the Air District's thresholds include:

- 280 single family residences
- 870,000 square feet of general office building
- 8,000 square feet of fast-food restaurant.

Projects falling considerably under these sizes may be safely assumed to need no quantification of ozone precursor or PM_{10} emissions. As described in Impact AIR-2, above, the project would not generate a substantial amount of traffic, nor would it warrant a project-specific traffic study. The volume of traffic estimated to be generated by the operation of the Grasslands site, approximately 28

peak-day trips or 10 average annual daily trips, is considerably less than the traffic that would be generated by the land use sizes contained in the Air District's screening criteria table. Therefore, project operation would be less than the Air District's screening criteria, and less than significant for operational ozone precursors, PM_{10}, and $PM_{2.5}$.

Beamer/Cottonwood Site

Construction

Construction annual and daily emissions are provided in Table 3.3-7 and Table 3.3-8, respectively. As shown in the tables, project construction would not exceed the Air District's annual or daily emissions thresholds. Therefore, construction of the Beamer/Cottonwood site would be less than significant construction ozone, PM_{10} and $PM_{2.5}$ emissions.

Table 3.3-7: Beamer/Cottonwood Site Construction Annual Emissions

Source	Emissions (tons)			
	ROG	NO_x	PM_{10}	$PM_{2.5}$
Site Grading and Road Construction	0.01	0.04	0.06	0.01
Trenching	0.00	0.00	0.00	0.00
PV Installation	0.00	0.03	0.00	0.00
Total Annual Emissions	0.01	0.07	0.06	0.02
Air District Threshold	10	10	None	None
Significant?	No	No	No	No

Note:
Totals based on non-rounded emissions.
Source: Michael Brandman Associates, 2012.

Table 3.3-8: Beamer/Cottonwood Site Construction Daily Emissions

Source	Emissions (tons)			
	ROG	NO_x	PM_{10}	$PM_{2.5}$
Site Grading and Road Construction	0.92	7.13	10.40	2.45
Trenching	0.14	0.85	0.07	0.07
PV Installation	0.18	1.26	0.09	0.09
Maximum Daily Emissions	0.92	7.13	10.40	2.45
Air District Threshold	None	None	80	None
Significant?	No	No	No	No

Note:
Phases are assumed to not overlap.
Source: Michael Brandman Associates, 2012.

Operation

As with the Grasslands site, operation of the Beamer/Cottonwood site would generate substantially fewer trips than the land uses contained in the Air District's screening criteria. In addition, the Beamer/Cottonwood project site would not generate Park Host, educational, or public access vehicle trips. Therefore, operation of the Beamer/Cottonwood site would be less than significant for operational ozone, PM_{10}, and $PM_{2.5}$.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Grasslands Site

Implement Mitigation Measure AIR-2.

Beamer/Cottonwood Site

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Sensitive Receptors

Impact AIR-4:	**The project may expose sensitive receptors to substantial air pollutant concentrations.**

Impact Analysis

This impact will assess the potential for the proposed project's potential to expose sensitive receptors to substantial concentrations of localized PM_{10}, $PM_{2.5}$, carbon monoxide, diesel particulate matter, as discussed below.

Grasslands Site

CO Hotspot

The project's potential to violate the CO air quality standards was evaluated in Impact AIR-2, above. As found in Impact AIR-2, the project would not result in significant localized CO impacts.

Fugitive Dust

The project's potential to generate a localized fugitive dust impact during construction was evaluated in Impact AIR-2, above. As found in Impact AIR-2, the project would not result in significant localized fugitive dust impact after implementation of the Air District's Best Management Practices and Mitigation Measure AIR-2.

Diesel Particulate Matter and Toxic Air Contaminants

The Air District currently does not provide screening criteria or recommendations for quantifying construction-related DPM or TACs. However, health-related risks associated with diesel exhaust

emissions are primarily associated with long-term exposure and associated risk of contracting cancer. The estimation f cancer risks associated with exposure to toxic air contaminants is typically calculated based on a 70-year period of exposure. The use of diesel-powered construction equipment for the project, however, would occur during short, discrete episodes over a 4-month period and would occur within a relatively small area. For this reason, diesel exhaust generated by construction, in and of itself, would not be expected to create conditions where the probability of contracting cancer over a 70-year lifetime of exposure is greater than 10 in 1 million for nearby receptors.

Beamer/Cottonwood Site

CO Hotspot

The project's potential to violate the CO air quality standards was evaluated in Impact AIR-2, above. As found in Impact AIR-2, the project would not result in significant localized CO impacts.

Fugitive Dust

The project's potential to generate a localized fugitive dust impact during construction was evaluated in Impact AIR-2, above. As found in Impact AIR-2, the project would not result in significant localized fugitive dust impact after implementation of the Air District's Best Management Practices and Mitigation Measure AIR-2.

Diesel Particulate Matter and Toxic Air Contaminants

The Air District currently does not provide screening criteria or recommendations for quantifying construction-related DPM or toxic air contaminants (TACs). However, health-related risks associated with diesel exhaust emissions are primarily associated with long-term exposure and associated risk of contracting cancer. The estimation f cancer risks associated with exposure to toxic air contaminants is typically calculated based on a 70-year period of exposure. The use of diesel-powered construction equipment for the project, however, would occur during short, discrete episodes over a 4-month period and would occur within a relatively small area. For this reason, diesel exhaust generated by construction, in and of itself, would not be expected to create conditions where the probability of contracting cancer over a 70-year lifetime of exposure is greater than 10 in 1 million for nearby receptors.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Grasslands Site

Implement Mitigation Measure AIR-2.

Beamer/Cottonwood Site

Implement Mitigation Measure AIR-2.

Level of Significance After Mitigation

Less than significant impact.