This section examines the air quality of the County and also describes available data on measured contaminant levels. This impact analysis addresses County-wide and regional air quality impacts (including impacts associated with greenhouse gas emissions and climate change) and identifies mitigation measures to lessen those impacts based on technical analysis conducted by Illingworth & Rodkin, Inc. and data assembled in the Background Data Report (Napa County, BDR 2005).

4.8.1 EXISTING SETTING

AIR BASIN CHARACTERISTICS

Napa County is one of nine counties in the San Francisco Bay Area Air Basin (SFBAAB) that is managed by the Bay Area Air Quality Management District (BAAQMD). The San Francisco Bay Area Air Basin consists of nine Bay Area counties, though only the southernmost portions of Sonoma County and Solano Counties are included. The SFBAAB is bordered by the North Coast and Lake County Air Basins to the north, the Sacramento and San Joaquin Valley Air Basins to the east, and the North Central Coast Air Basin to the South.

Napa Valley lies within Napa County, an area bordered by relatively high mountains to the east and west. The mountains surrounding the Napa Valley have an average ridgeline height of approximately 2,000 feet, while some peaks approach more than 4,000 feet in elevation. The existing air quality conditions in the County can be generally characterized by monitoring data collected in the region. The nearest air quality monitoring station in the vicinity of the study area is the Jefferson Street monitoring station in the City of Napa. However, it should be noted that Napa County consists of varied topographic and precipitation conditions that result in varied micro climate conditions within the County. Air quality monitoring data from the Jefferson Street monitoring station represent air quality monitoring data for the last 3 years (2002–2004) for which complete data are available.

Napa County is home to many industries, processes, and actions that generate emissions of criteria pollutants. The California Air Resources Board (ARB) compiles an emissions inventory for all sources of emissions within the County. This inventory is used by the BAAQMD and ARB for regional air quality planning purposes and is the basis for the region's air quality plans. The inventory includes such sources as stationary (e.g., landfills, electric utilities, mineral processes); area-wide (e.g., farming operations, construction/demolition activities, residential fuel combustion); and mobile sources (e.g., automobiles, aircraft, off-road equipment).

CLIMATE AND METEOROLOGY

The summer average maximum temperatures are in the low 80s at the southern end of the valley and in the low 90s at the northern end, while winter average maximum temperatures are in the high 50s and low 60s, with minimum temperatures in the high to mid 30s in the slightly cooler northern end of the valley. Due to the climate and terrain of the valley, the potential for air pollution could be high if there were sufficient sources of air contaminants nearby. The summer and fall prevailing winds can transport ozone precursors northward from the Carquinez Strait Region to the Napa Valley, which effectively traps and concentrates pollutants when stable conditions are present. In addition, pollutants may be recirculated by the local upslope and downslope flows created by the surrounding mountains, contributing to buildup of air pollution within the valley. In the late fall and winter, particulate matter from motor vehicles, agriculture and woodburning in fireplaces and stoves can build up in the valley because of the high frequency of light winds and stable atmospheric conditions.

Figure 4.11-2 shows equal annual rainfall contours (isohyetal). The rainfall stations used to develop the isohyetal contour map are shown in the figure. In terms of general precipitation patterns, the figure indicates that rainfall distribution is strongly correlated with elevation. For example, average annual rainfall along a transect may range from the hills south of Calistoga (~45 in/yr), across the valley floor near Calistoga (~30 in/yr), and then up the hills north of Calistoga (more than 45 in/yr). A strong "rain shadow" effect is also observed in the County, whereby rainfall amounts decrease eastward because frontal storms arriving from the Pacific Coast lose moisture and saturation as they pass over progressive ridgelines to the east. As observed in the eastern area of the County towards Knoxville/Berryessa, average annual precipitation is about less then 15 in/year compared to the moister western county. Precipitation intensity conditions are also described in Section 4.11 (Hydrology and Water Quality).

The Napa Valley is widest at its southern end and narrows to the north, and the mountains surrounding the valley serve as effective barriers to the prevailing northwesterly winds. In the daytime, the prevailing winds flow upvalley from the south about half of the time, with a strong upvalley wind frequently developing during warm summer afternoons, which draws in air from the San Pablo Bay. Occasionally daytime winds will flow downvalley from the north. Downvalley drainage often occurs in the evening, especially in the winter months. Wind speeds are generally low, with almost 50 percent of the winds speeds below 4 miles per hour (mph). Only 5 percent of the wind speeds are between 16 and 18 mph; such speeds are representative of winter storms and strong summertime upvalley winds.

AMBIENT AIR QUALITY

The Jefferson Street Monitoring Station in Napa County (located at 2552 Jefferson Street) measures five pollutants: ozone (O_3), particulate matter (PM_{10}), carbon monoxide (CO), nitrogen oxide (NO_x), and sulfur dioxide (SO_2). It does not measure $PM_{2.5}$. The nearest monitoring site for these two pollutants is the Tuolumne Street station in Vallejo. Air quality monitoring data from the Jefferson Street monitoring station are summarized in **Table 4.8-1** and air quality monitoring data from the Tuolumne Street monitoring station are summarized in **Table 4.8-2**. These data represent air quality monitoring data for 2002–2004, for which complete data are available.

TABLE 4.8-1
AMBIENT AIR QUALITY MONITORING DATA FOR NAPA (2552 JEFFERSON STREET)

Pollutant Standards	2003	2004	2005
Ozone (O3)			
Maximum 1-hour concentration (ppm)	0.11	0.09	.09
Maximum 8-hour concentration (ppm)	0.08	0.07	.07
Number of days standard exceeded[a]			
NAAQS 1-hour (>0.12 ppm)	0	0	0
CAAQS 1-hour (>0.09 ppm)	2	0	0
NAAQS 8-hour (>0.08 ppm)	0	0	0
Carbon Monoxide (CO)			
Maximum 8-hour concentration (ppm)	2.5	2.0	2.0
Maximum 1-hour concentration (ppm)	4.7	3.7	3.2
Number of days standard exceeded[a]			
NAAQS 8-hour (>9.0 ppm)	0	0	0
CAAQS 8-hour (>9.0 ppm)	0	0	0
NAAQS 1-hour (>35 ppm)	0	0	0
CAAQS 1-hour (>20 ppm)	0	0	0
Particulate Matter (PM10)[b]			
Maximum 24-hour concentration ($\mu g/m^3$)	41	60	40
Annual average concentration ($\mu g/m^3$)[e]	21	21	18
Number of days standard exceeded[a]			
NAAQS 24-hour (>150 $\mu g/m^3$)[f]	0	0	0
CAAQS 24-hour (>50 $\mu g/m^3$)[f]	0	6	0

Notes:
CAAQS = California ambient air quality standards. NAAQS = national ambient air quality standards.
Highlighted cells indicate an exceedances.
a An exceedance is not necessarily a violation. It should be noted that the federal ozone 1 hour standard has been revoked by EPA.
b Measurements usually are collected every 6 days.
c National statistics are based on standard conditions data. In addition, national statistics are based on samplers using federal reference or equivalent methods.
d State statistics are based on local conditions data, except in the South Coast Air Basin, for which statistics are based on standard conditions data. In addition, state statistics are based on California-approved samplers.
e State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
f Mathematical estimate of how many days concentrations would have been measured as higher than the level of the standard had each day been monitored.
Sources: Bay Area Air Quality Management District Air Pollution Summaries 2003, 2004, and 2005.

TABLE 4.8-2
AMBIENT AIR QUALITY MONITORING DATA FOR VALLEJO (304 TUOLUMNE STREET)

Pollutant Standards	2003	2004	2005
Ozone			
Maximum 1-hour concentration (ppm)	0.10	0.10	.09
Maximum 8-hour concentration (ppm)	0.07	0.07	.07
Number of days standard exceeded[a]			
NAAQS 1-hour (>0.12 ppm)	0	0	0
CAAQS 1-hour (>0.09 ppm)	1	1	0
NAAQS 8-hour (>0.08 ppm)	0	0	0
Carbon Monoxide (CO)			
Maximum 8-hour concentration (ppm)	2.9	3.4	3.1
Maximum 1-hour concentration (ppm)	4.0	4.0	3.9
Number of days standard exceeded[a]			
NAAQS 8-hour (>9.0 ppm)	0	0	0
CAAQS 8-hour (>9.0 ppm)	0	0	0
NAAQS 1-hour (>35 ppm)	0	0	0
CAAQS 1-hour (>20 ppm)	0	0	0
Nitrogen Dioxide (NO_2)			
Maximum 1-Hour concentration (ppm)	0.07	0.05	0.07
Annual Concentration (ppm)	0.012	0.012	0.011
Number of days standard exceeded[a]			
CAAQS 1-hour (>0.25 ppm)	0	0	0
Sulfur Dioxide (SO_2)			
Maximum 24-Hour concentration (ppm)	0.005	0.005	0.005
Annual Concentration (ppm)	0.0012	0.0013	0.0012
Number of days standard exceeded[a]			
CAAQS 24-hour (>0.04 ppm)	0	0	0
NAAQS 24-hour (>0.14 ppm)	0	0	0
Particulate Matter (PM10)[b]			
Maximum 24-hour concentration ($\mu g/m^3$)	39	51	52
Annual average concentration ($\mu g/m^3$)[e]	17	20	17
Number of days standard exceeded[a]			
NAAQS 24-hour (>150 $\mu g/m^3$)[f]	0	0	0
CAAQS 24-hour (>50 $\mu g/m^3$)[f]	0	6	6
Particulate Matter (PM2.5)[b]			

Pollutant Standards	2003	2004	2005
Maximum 24-hour concentration ($\mu g/m^3$)	31	40	44
Annual average concentration ($\mu g/m^3$)[e]	9	11	10
Number of days standard exceeded[a]			
NAAQS 24-hour (>65 $\mu g/m^3$)[f]	0	0	0

Notes:
CAAQS = California ambient air quality standards. NAAQS = national ambient air quality standards.
Highlighted cells indicate an exceedances.

a An exceedance is not necessarily a violation. It should be noted that the federal ozone 1 hour standard has been revoked by EPA.

b Measurements usually are collected every 6 days.

c National statistics are based on standard conditions data. In addition, national statistics are based on samplers using federal reference or equivalent methods.

d State statistics are based on local conditions data, except in the South Coast Air Basin, for which statistics are based on standard conditions data. In addition, state statistics are based on California-approved samplers.

e State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

f Mathematical estimate of how many days concentrations would have been measured as higher than the level of the standard had each day been monitored.

Sources: Bay Area Air Quality Management District Air Pollution Summaries 2003, 2004, and 2005.

AMBIENT AIR QUALITY STANDARDS

Both the U.S. Environmental Protection Agency and the California Air Resources Board have established ambient air quality standards for air pollutants. These ambient air quality standards are levels of contaminants representing safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents.

The federal and California state ambient air quality standards are summarized in **Table 4.8-3** for important pollutants. The federal and state ambient standards were developed independently with differing purposes and methods, although both processes attempted to avoid health related effects. As a result, the federal and state standards differ in some cases. State standards, which are entirely health-based, are more stringent. This is particularly true for ozone and suspended particulate matter ($PM_{2.5}$ and PM_{10}).

The State of California regularly reviews scientific literature regarding the health effects of pollutants. On May 3, 2002, the California Air Resources Board (CARB) staff recommended lowering the level of the annual standard for PM_{10} and establishing a new annual standard for $PM_{2.5}$ (particulate matter 2.5 micrometers in diameter and smaller). The new standards became effective on July 5, 2003, with another revision on November 29, 2005. In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. Toxic Air Contaminants (TACs) are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants. Unlike criteria pollutants, TACs are regulated on the basis of risk rather than specification of safe levels of contamination.

U.S. EPA recently adopted a new more stringent standard of 35 µg/m^3 for 24-hour exposures of $PM_{2.5}$, based on a review of the latest new scientific evidence. At the same time, U.S. EPA revoked the annual PM_{10} standard due to a lack of scientific evidence correlating long-term exposures of ambient PM_{10} with health effects.

TABLE 4.8-3
FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1-Hour 8-Hour	- 0.08 ppm	0.09 ppm 0.070 ppm
Carbon Monoxide	8-Hour 1-Hour	9.0 ppm 35.0 ppm	9.0 ppm 20.0 ppm
Nitrogen Dioxide	Annual 1-Hour	0.053 ppm --	-- 0.25 ppm
Sulfur Dioxide	Annual 24-Hour 3-Hour 1-Hour	0.03 ppm 0.14 ppm - --	-- 0.04 ppm - 0.25 ppm
PM_{10}	Annual 24-Hour	- 150 ug/m^3	20 ug/m^3 50 ug/m^3
$PM_{2.5}$	Annual 24-Hour	15 ug/m^3 35 ug/m^3	12 ug/m^3 --
Lead	30-Day Avg. 3-Month Avg.	-- 1.5 ug/m^3	1.5 ug/m^3 --

Source: California Air Resources Board (09/22/06)
Notes: ppm = parts per million, ug/m3 = Micrograms per Cubic Meter

AIR POLLUTANTS OF CONCERN AND HEALTH EFFECTS

The Environmental Protection Agency (EPA) revoked the 1-hour ozone standard in 2005. For the 8-hour ozone standard, the EPA has classified the SFBAAB as a marginal nonattainment area. For the CO standard, the study area lies in the urbanized areas described in the Technical Support document from 3/29/85, 50 CFR 12540, and is classified as a moderate (≤ 12.7 ppm) maintenance area, while the rest of the County is classified as an unclassified/attainment area. The EPA has classified the County as an unclassified/attainment area for the PM_{10} and $PM_{2.5}$ standards. Designations for the new 24-hour national $PM_{2.5}$ standards are expected in 2010 after review of 2007-2009 monitoring data. The ARB has classified the entire Bay Area as a serious nonattainment area for the 1-hour ozone standard. For the CO standard, the ARB has classified the County as an attainment area. The ARB has classified the SFBAAB as a nonattainment area for the PM_{10} and $PM_{2.5}$ standards. The County's attainment status for each of these pollutants relative to the NAAQS and CAAQS is summarized in **Table 4.8-4**.

Ozone and NO2 are generally considered regional pollutants because these pollutants or their precursors affect air quality on a regional scale. Pollutants such as CO, SO2, and lead are considered local pollutants because they tend to accumulate in the air locally. Particulate matter is considered both a localized pollutant and a regional pollutant.

In Napa County, ozone and particulate matter are of the most problematic pollutants. The following is a discussion of the health effects and major sources of important pollutants in the BAAQMD.

TABLE 4.8-4
2006 NAPA COUNTY ATTAINMENT STATUS FOR STATE AND FEDERAL STANDARDS

Pollutant	Federal	State
1-hour O3	Standard revoked in 2005	Serious nonattainment
8-hour O3	Marginal nonattainment	Unclassified[a]
CO	Moderate (≤ 12.7 ppm) maintenance area for the Urbanized Areas (3/29/85, 50 CFR 12540), unclassified/attainment area for rest of the County	Attainment
PM_{10}	Unclassified/attainment	Nonattainment
PM_{10} Annual	Unclassified/attainment	Nonattainment
$PM_{2.5}$ 24-hour	Attainment	NA
$PM_{2.5}$ – Annual	Attainment	Nonattainment

Source: California Air Resources Board 2005
Note: [a] This standard was approved by CARB on April 28, 2005 and became effective on May 17, 2006.

Ozone

Ground level ozone, commonly referred to as smog, is greatest on warm, windless, sunny days. Ozone is not emitted directly into the air, but formed through a complex series of chemical reactions between reactive organic gases (ROG) and nitrogen oxides (NOx). These reactions occur over time in the presence of sunlight. Ground level ozone formation can occur in a matter of hours under ideal conditions. The time required for ozone formation allows the reacting compounds to spread over a large area, producing a regional pollution concern. Once formed, ozone can remain in the atmosphere for one or two days.

Ozone is also a public health concern because it is a respiratory irritant that increases susceptibility to respiratory infections and diseases, and because it can harm lung tissue at high concentrations. In addition, ozone can cause substantial damage to leaf tissues of crops and natural vegetation and can damage many natural and manmade materials by acting as a chemical oxidizing agent. The principal sources of the ozone precursors (ROG and NOx) are the combustion of fuels and the evaporation of solvents, paints, and fuels.

As indicated in **Table 4.8-1**, the Jefferson Street monitoring station has experienced one violation of the state 1-hour ozone standard and no exceedances of the federal 8-hour ozone standard in the last three years. If pollutant concentrations monitored in an air basin meet state or federal standards over a designated period of time, the basin is classified as being in attainment for that pollutant. If monitored pollutant concentrations violate the standards, the area is considered a nonattainment area for that pollutant. If data are insufficient to determine whether a pollutant is violating the standard and there is no evidence that the standard would be violated, the area is designated unclassified. The entire San Francisco Bay Area, including Napa County, is currently in non-attainment for the 1 hour state ozone standard (CARB 2006).

Particulate Matter (PM)

Particulate matter can be divided into several size fractions. Coarse particles are between 2.5 and 10 microns in diameter, and arise primarily from natural processes, such as wind-blown dust or soil. Fine particles are less than 2.5 microns in diameter and are produced mostly from combustion, or burning activities. Fuel burned in cars and trucks, power plants, factories, fireplaces and wood stoves produces fine particles.

The federal and state ambient air quality standard for particulate matter applies to two classes of particulates: PM_{10} and $PM_{2.5}$. The state PM_{10} standards are 50 micrograms per cubic meter (µg/m3) as a 24-hour average and 20 µg/m3 as an annual geometric mean. The federal PM_{10} standards are 150 µg/m3 as a 24-hour average. The federal $PM_{2.5}$ standards are 15 µg/m3 for the annual average and 35 µg/m3 for the 24-hour average. The state $PM_{2.5}$ standard is 12 µg/m3 as an annual geometric mean. State and federal standards are summarized in **Table 4.8-3**.

Exposure to elevated levels of fine particulate matter in the air is a public health concern because it can bypass the body's natural filtration system more easily than larger particles, and can lodge deep in the lungs. The health effects vary depending on a variety of factors, including the type and size of particles. Research has demonstrated a correlation between high PM concentrations and increased mortality rates. Elevated PM concentrations can also aggravate chronic respiratory illnesses such as bronchitis and asthma. In addition to damaging human health, particulates can also retard plant growth.

The Jefferson Street monitoring station has experienced an estimated 20 violations of the state 24-hour PM_{10} standard (PM_{10} is measured every 6th day and there were three exceedances); and no exceedances of the federal PM_{10} standard during the last 3 years. $PM_{2.5}$ is not monitored in Napa County. The Tuolume Street monitoring station in Vallejo has experienced an estimated 10 violations of the state 24-hour $PM_{2.5}$ standard and no exceedances of the federal $PM_{2.5}$ standard during the last 3 years.

Violations of air quality standards tend to vary seasonally. PM_{10} exceedances in the County are shown to occur primarily in the winter. Data obtained from the Jefferson Street monitoring station between 2000 and 2006, seven of the eight measured days that exceeded state 24-hour PM_{10} standards occurred during the winter months (November through February). The data occasionally shows that PM_{10} exceedances in the County can occur in the early fall (October 12, 2004) in rural areas, but these levels may be affected by wildfires in the region. Wood smoke emissions tend to be greatest on fall, winter, and spring days and nights when meteorological conditions are conducive to high PM_{10} and $PM_{2.5}$ levels. In the late spring, summer, and early fall days and nights, high PM_{10} and $PM_{2.5}$ levels tend to be due to fires and dust from agricultural activities.

The EPA has classified SFBAAB as an unclassified/attainment area for the PM_{10} and $PM_{2.5}$ standards. Under state PM standards, SFBAAB is considered a nonattainment area.

Particulate Matter Emissions Associated With Wood Smoke

Wood smoke has long been identified as a significant source of pollutants in urban and suburban areas. Under certain meteorological conditions – cold, stagnant winter evenings – surface based radiation inversions form quickly in the Bay Area and PM levels rise rapidly. By the 1980s, wood smoke became the largest area-wide stationary source of particulate matter in the Bay Area. Studies by the Air District indicated that wood smoke was responsible for an average of one-third of the PM_{10} in the air basin during the winter months and 70 percent of the PM_{10} in

Santa Rosa. In addition, wood burning generates carbon monoxide, NOx, PM_{10} and toxic air pollutants such as benzene and dioxin (BAAQMD 2006(b)). Present controls for this source implemented in some jurisdictions include the adoption of emission standards for wood stoves and fireplace inserts. In response to scientific studies that correlate rising PM levels with serious health effects and the proliferation of wood heaters in the 1970s and 80s, the U.S. Environmental Protection Agency (EPA) set a national PM emission standard for woodstoves at 7.5 grams per hour. Since July 1, 1990, all woodstoves manufactured in the United States have been required to meet this EPA standard. Natural gas-fueled fireplaces or woodstoves have much less emissions. Previously, unregulated woodstoves averaged 60 grams of PM in an hour. Interest in wood smoke is likely to increase with the recent adoption of a $PM_{2.5}$ (particulate matter less than 2.5 microns in diameter) national standard.

Carbon Monoxide (CO)

Carbon monoxide (CO) is an odorless, colorless gas that is formed by the incomplete combustion of fuels. Motor vehicle emissions are the dominant source of CO in the Napa region. At high concentrations, CO reduces the oxygen-carrying capacity of the blood and can cause dizziness, headaches, unconsciousness, and even death. CO can also aggravate cardiovascular disease. Relatively low concentrations of CO can significantly affect the amount of oxygen in the bloodstream because CO binds to hemoglobin 220–245 times more strongly than oxygen.

CO emissions and ambient concentrations have decreased significantly in recent years. These improvements are due largely to the introduction of cleaner burning motor vehicles and motor vehicle fuels. The Napa region has attained the State and national CO standard. The records from the region's monitoring stations show that the CO standard has not been exceeded since 1991. CO is still a pollutant that must be closely monitored, however, due to its severe effect on human health.

Elevated CO concentrations are usually localized and are often the result of a combination of high traffic volumes and traffic congestion. Elevated CO levels develop primarily during winter periods of light winds or calm conditions combined with the formation of ground- level temperature inversions. CO concentrations are higher in the winter because of reduced dispersion of vehicle emissions and because CO emission rates from motor vehicles increase as temperature decreases.

Carbon Monoxide levels in Napa County are declining. For the CO standard in Napa County, the urbanized areas are classified as a moderate (≤ 12.7 ppm) maintenance area for CO, while the remainder of the County is classified as an unclassified/attainment area. The ARB has classified the County as an attainment area. There have been no violations of the federal or state CO standards recorded at the Jefferson Street Station.

Toxic Air Contaminants (TACs)

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. Unlike criteria pollutants, no safe levels of exposure to TACs have been established. There are many different types of TACs, with varying degrees of toxicity. Sources of TAC's include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Public exposure to TACs can result from emissions from normal operations, as well as accidental releases of hazardous materials during upset conditions. The health effects of TACs include cancer, birth defects, neurological damage and death.

Diesel exhaust is a TAC of growing concern in California. The ARB in 1998 identified diesel engine particulate matter as a TAC. The exhaust from diesel engines contains hundreds of different gaseous and particulate components, many of which are toxic. Many of these compounds adhere to the particles, and because diesel particles are so small, they penetrate deep into the lungs. Diesel engine particulate has been identified as a human carcinogen. Mobile sources, such as trucks, buses, automobiles, trains, ships and farm equipment are by far the largest source of diesel emissions. Studies show that diesel particulate matter concentrations are much higher near heavily traveled highways and intersections.

It is important to understand that TACs are not considered criteria air pollutants and thus are not specifically addressed through the setting of ambient air quality standards. Instead, EPA and ARB regulate Hazardous Air Pollutants (HAPs) and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology (MACT and BACT) to limit emissions. The BAAQMD further regulates these sources by requiring health risks assessments for new or modified stationary sources with substantial emissions and only permits these sources if the risks to the public are acceptable.

Diesel Exhaust/Land Use Issues

In 1998, after a 10-year scientific assessment process, the Air Resources Board identified particulate matter from diesel-fueled engines as a toxic air contaminant (TAC). Unlike criteria pollutants like carbon monoxide, TACs do not have ambient air quality standards. Since no safe levels of TACs can be determined, there are no air quality standards for TACs. Instead, TAC impacts are evaluated by calculating the health risks associated with a given exposure. Two types of risk are usually assessed: chronic non-cancer risk and acute non-cancer risk. Diesel particulate has been identified as a carcinogenic material, but is not considered to have acute non-cancer risks. The state has begun a program of identifying and reducing risks associated with particulate matter emissions from diesel-fueled vehicles. In September 2000, the Air Resources Board approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled engines and vehicles. The goal of the Plan is to reduce diesel PM emissions and the associated health risk by 75 percent in 2010 and 85 percent by 2020. The Plan consists of new regulatory standards for all new on road, off-road and stationary diesel-fueled engines and vehicles, new retrofit requirements for existing on-road, off-road and stationary diesel-fueled engines and vehicles, and new diesel fuel regulations to reduce the sulfur content of diesel fuel as required by advanced diesel emission control systems. Land uses where individuals could be exposed to high levels of diesel exhaust include:

- Warehouses
- Schools with high volume of bus traffic
- High volume highways
- High volume arterials and local roadways with high level of diesel traffic.

Wine Fermentation

The fermentation and bulk storage of wine is a source of ethanol emissions. Ethanol is considered a precursor to ozone formation, termed volatile organic compound. The BAAQMD currently does not regulate emissions from wine fermentation. CARB has developed emissions factors for fermentation of both red and white wine. Red wine produces higher emissions since it is fermented at much warmer conditions, for a shorter period, and is capped by grape skins. Fermentation is at its peak during September through October. The San Joaquin Valley Air Pollution Control District (SJVAPCD) currently regulates these emissions through rule 4694 for wineries with uncontrolled baseline ethanol emissions of 10 tons per year or greater. Under this

rule, wineries have to reduce their baseline VOC emissions from wine fermentation by 35 percent. The rule requires controls on large wine bulk storage tanks. The controls include gas-tight tanks with pressure-vacuum relief valves and temperature storage limits. SJVAPCD estimates that the rule will reduce VOC emissions in San Joaquin Valley by about 0.6 tons per day.

Sensitive Receptors and Stationary Pollutant Sources

Some groups of people are more affected by air pollution than others. The State has identified the following people who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks.

Children may be more vulnerable to environmental contaminants than adults. The Children's Environmental Health Protection Act (State Senate Bill 25) established specific requirements to determine if children are adequately protected from the harmful effects of air pollution. The Act requires CARB and the Office of Environmental Health Hazard Assessment (OEHHA) to review all health based California's Ambient Air Quality Standards to determine whether they adequately protect public health, including infants and children. Those found possibly inadequate would undergo full review and possible revision. The Act also requires CARB to determine if the current air monitoring network established to measure air pollution in California adequately reflects the levels of air pollutants that infants and children are breathing. Additionally, the Act also requires that the State's list of Toxic Air Contaminants be reviewed to identify those that might cause infants and children to be especially susceptible to illness and to institute Air Toxic Control Measures (ATCM) that would be needed to reduce exposures. In 2005, the CARB added a new 8-hour ozone standard in response to a review of the air quality standards required by this Act.

Greenhouse Gases and Climate Change Linkages

Constituent gases of the Earth's atmosphere called atmospheric greenhouse gases (GHGs) play a critical role in the Earth's radiation budget by trapping infrared radiation emitted from the Earth's surface, which could have otherwise escaped to space. Prominent GHGs contributing to this process include water vapor, carbon dioxide (CO_2), methane (CH_4), ozone, nitrous oxide (N_2O), and chlorofluorocarbons (CFC)s. This phenomenon, known as the "Greenhouse Effect", keeps the Earth's atmosphere near the surface warmer than it would be otherwise and allows for successful habitation by humans and other forms of life. However, increases in these gases lead to more absorption of radiation and warm the lower atmosphere further, thereby increasing evaporation rates and temperatures near the surface. Anthropogenic emissions of these GHGs in excess of natural ambient concentrations are thought to be responsible for the enhancement of the Greenhouse Effect and a trend of unnatural warming of the Earth's natural climate. GHGs of these gases are attributable to human activities associated with industrial/manufacturing, utilities, transportation, residential, and agricultural sectors (CEC 2006a). Transportation is responsible for 41% of the state's GHG emissions, followed by electricity generation (CEC 2006a). Emissions of CO_2 and NO_x are byproducts of fossil fuel combustion. Methane, a highly potent GHG, results from off-gassing associated with agricultural practices and landfills. Sinks of CO_2 include uptake by vegetation and dissolution into the ocean.

Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants and TACs, which are pollutants of regional and local concern. Worldwide, California is the 12th to 16th largest emitter of CO_2, and is responsible for approximately 2% of the world's CO_2 emissions (CEC 2006a, 2006b). In 2004, California produced 492 million gross metric tons of carbon dioxide-equivalent (CEC 2006a). The BAAQMD Source Inventory of Bay Area Greenhouse Gas Emissions (2006) identifies that in year 2002, the Bay Area emitted approximately 85.4 million tons of CO_2-equivalent greenhouse gases, of which Napa County was the lowest contributor at 1.4 million tons (1.4% of the total Bay Area emissions). In August of 2006, The City of St. Helena formed the Climate Protection Task Force which aims to study the goals of the US Mayors' Climate Protection Agreement to determine the local level of compliance and what actions are needed.

Increased global average temperature increases ocean temperatures and the Pacific Ocean strongly influences the climate within California. If the temperature of the ocean warms, it is anticipated that the winter snow season would be shortened. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the state. According to a California Energy Commission report, the snowpack portion of the supply could potentially decline by 70%-90% by the end of the 21st century (CEC 2006c). This phenomenon could lead to significant challenges securing an adequate water supply for a growing state population. Further, the increased ocean temperature could result in increased moisture flux into the state; however, since this would likely increasingly come in the form of rain rather than snow in the high elevations, increased precipitation could lead to increased potential and severity of flood events, placing more pressure on California's levee/flood control system. Sea level has risen approximately seven inches during the last century and, according to the CEC report, it is predicted to rise an additional 22-35 inches by 2100, depending on the future GHG emissions levels (CEC 2006c). If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion and disruption of wetlands (CEC 2006c). As the existing climate throughout California changes over times, mass migration of species, or worse, failure of species to migrate in time to adapt to the perturbations in climate, could also result.

4.7.2 REGULATORY FRAMEWORK

Air quality in the Basin is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies primarily responsible for improving the air quality in Napa County are discussed below along with their individual responsibilities.

FEDERAL

The U.S. Environmental Protection Agency (EPA) is responsible for enforcing the 1990 amendments to the Federal Clean Air Act (CAA) and the national ambient air quality standards (federal standards) that it establishes. These standards identify levels of air quality for six "criteria" pollutants, which are considered the maximum levels of ambient (background) air pollutants considered safe, with an adequate margin of safety, to protect public health and welfare. The six criteria pollutants include ozone, CO, nitrogen dioxide (NO_2 - a form of NO_X), sulfur dioxide (SO_2 - a form of SO_X), particulate matter 10 microns in size and smaller (PM_{10}), and lead. The U.S. EPA also has regulatory and enforcement jurisdiction over emission sources beyond state waters (outer continental shelf), and sources that are under the exclusive authority of the federal government, such as aircraft, locomotives, and interstate trucking.

STATE

The State Air Resources Board (ARB), a department of the California Environmental Protection Agency (Cal EPA), oversees air quality planning and control throughout California. It is primarily responsible for ensuring implementation of the 1989 amendments to the California Clean Air Act (CCAA), responding to the federal CAA requirements, and for regulating emissions from motor vehicles and consumer products within the State. The ARB has established emission standards for vehicles sold in California and for various types of equipment available commercially. It also sets fuel specifications to further reduce vehicular emissions.

The amendments to the CCAA establish ambient air quality standards for the state (state standards) and a legal mandate to achieve these standards by the earliest practical date. These standards apply to the same six criteria pollutants as the Federal CAA, and also include sulfate, visibility, hydrogen sulfide, and vinyl chloride. They are more stringent than the federal standards and, in the case of PM_{10} and SO_2, far more stringent.

Tanner Air Toxics Act

California regulates TACs primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and has adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the ARB list of TACs.

Once a TAC is identified, ARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions.

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

Senate Bill 656

In 2003 the California Legislature enacted Senate Bill 656, to reduce public exposure to PM_{10} and $PM_{2.5}$. SB 656 legislation required BAAQMD to review a list of PM control measures compiled by CARB and identify measures that are most appropriate to the region. BAAQMD reviewed this list and adopted a PM implementation schedule on November 16, 2005. The BAAQMD staff report along with comments on the report focused mainly on wood smoke issues. Of the 103 measures compiled by CARB, BAAQMD proposed implementing four of the measures. Many of the

measures were either similar to measures already adopted by BAAQMD or the benefit of the measure would not be significant. Ten measures that target wood burning were identified for further study. These include rulemaking that could prohibit installation of open fireplaces or wood burning stoves that do not meet current EPA standards. One measure could prohibit wood burning on certain nights. BAAQMD identified additional PM reduction efforts that are being implemented immediately. These include characterizing and controlling wood smoke. BAAQMD plans to enhance monitoring at the neighborhood level and focus more on controlling wood smoke. One measure would include lowering the forecasted air quality index threshold used to make Spare the Air Tonight alerts and step up enforcement when complaints regarding wood smoke are received. SB 656 requires CARB to prepare a report by 2009 that describes actions taken to fulfill the requirements of the legislation as well as recommendations for further actions to assist in achieving the State PM standards.

Assembly Bill 32

California Senate Bill AB 32, the Global Warming Solutions Act of 2006, codifies the State's GHG emissions target by requiring the State's global warming emissions be reduced to 1990 levels by 2020 and directs CARB to enforce the statewide cap that would begin phasing in 2012. AB 32 was signed and passed into law by Governor Arnold Schwarzenegger on September 27, 2006.

Assembly Bill 1493

Assembly Bill 1493 (AB 1493) requires California Air Resources Board (ARB) to develop and adopt the nation's first greenhouse gas emission standards for automobiles. The legislature declared in AB 1493 that global warming was a matter of increasing concern for public health and environment in the state. It citied several risks that California faces from climate change, including reduction in the state's water supply, increased air pollution creation by higher temperatures, harm to agriculture, an increase in wildfires, damage to the coastline, and economic losses caused by higher food, water energy, and insurance prices. Further, the legislature stated that technological solutions to reduce greenhouse gas emissions would stimulate the California economy and provide jobs.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

The Bay Area Air Quality Management District coordinates the work of government agencies, businesses, and private citizens to achieve and maintain healthy air quality for the Bay Area. The BAAQMD develops market-based programs to reduce emissions associated with mobile sources, processes permits, determines whether the permit conditions have been met, ensures compliance with BAAQMD rules and regulations, and conducts long-term planning related to air quality.

Ozone Attainment Plan

The Ozone Attainment Plan (OAP) is the Bay Area's portion of California's SIP to achieve the national ozone standard. The BAAQMD, ABAG, and MTC prepared the Bay Area 2001 Ozone Attainment Plan, which was approved by the ARB in November 2001, and submitted to the EPA for approval as a revision to the California SIP on November 30, 2001. The 2001 OAP included two commitments for further planning—a commitment to conduct a mid-course review of progress toward attaining the national 1-hour ozone standard by December 2003, and a commitment to provide a revised ozone attainment strategy to the EPA by April 2004. On April 22, 2004, the EPA approved the following elements of the 2001 OAP: emissions inventory, RACMs, commitments to adopt and implement specific control measures, MVEBs, and commitments for further study measures.

The EPA made a final finding in April 2004 that the BAAQMD had attained the national 1-hour ozone standard. As a result, certain planning commitments outlined in the 2001 OAP were no longer required. While the EPA has prepared a finding of attainment for the region, the Bay Area has not been formally reclassified as an attainment area for the 1-hour standard. EPA revoked the 1-hour ozone standard in 2005.

On June 15, 2004, the region was designated nonattainment for the new national 8-hour ozone standard and classified as a "marginal" nonattainment area. The Bay Area is not required to submit an attainment demonstration, but is required to submit a 2002 base year emissions inventory by June 15, 2006. The California ARB will submit a statewide 2002 base year emissions inventory and that submittal will fulfill the near-term 8-hour ozone planning requirements for the BAAQMD. Once area has attained the new 8-hour ozone standard, a maintenance plan and demonstration with a request for re-designation to attainment will be required.

Meeting the 1-hour ozone standard illustrates the progress the Bay Area is making in cleaning up the air, however, effort on the part of the ARB and local air quality agencies must continue to ensure that the Bay Area continues to meet the 1-hour standard. The BAAQMD, ABAG, and MTC have organized an ozone-working group to evaluate and propose control strategies to be incorporated into future air quality planning.

Bay Area Clean Air Plan

The Bay Area Clean Air Plan (CAP) is a plan to reduce ground-level ozone levels in the San Francisco Bay Area to make progress in attaining the state 1-hour ozone standard. These plans are developed by the BAAQMD, in cooperation with ABAG and MTC, in response to the CCAA. The CCAA requires all air districts exceeding the state ozone standard to reduce pollutant emissions by 5percent per year, calculated from 1987, or achieve emission reductions through all feasible measures. The CCAA further requires that the CAP be updated every 3 years. As the Bay Area attained the state CO standard in 1993, the CCAA planning requirements for CO nonattainment areas no longer apply to the Bay Area. The first CAP, prepared in 1991, includes a comprehensive strategy to reduce air pollutant emissions by focusing on control measures to be implemented during the periods from 1991 to 1994 and 1995 through 2000 and beyond.

Bay Area Ozone Strategy

The BAAQMD recently adopted the Bay Area 2005 Ozone Strategy (BAOS) in cooperation with ABAG and MTC. The BAOS is the most recently approved regional Clean Air Plan. It was adopted in January 2006 to address the more stringent requirements of the California Clean Air Act with respect to ozone. This plan includes a comprehensive strategy to reduce emissions from stationary, area, and mobile sources. The plan objective is to indicate how the region would make progress toward attaining the stricter state air quality standards, as mandated by the California Clean Air Act. The plan is designed to achieve a region-wide reduction of ozone precursor pollutants through the expeditious implementation of all feasible measures. Air quality plans addressing the California Clean Air Act are developed on a triennial basis, with the latest approved plan developed in 2000 (i.e., Bay Area 2000 Clean Air Plan). This plan proposes implementation of transportation control measures (TCMs) and programs such as *Spare the Air.* Some of these measures or programs rely on local governments for implementation.

Consistency with BAOS

A key element in air quality planning is to make reasonably accurate projections of future human activities that are related to air pollutant emissions. Most important is vehicle activity. The BAAQMD uses population projections made by the ABAG and vehicle use trends made by the MTC to formulate future air pollutant emission inventories. The basis for these projections comes from cities and counties. In order to provide the best plan to reduce air pollution in the Bay Area, accurate projections from local governments are necessary. When individual projects are not consistent with these projections, they cumulatively reduce the effectiveness of air quality planning in the region.

Buffer Zones

The BAAQMD recommends that General Plans include buffer zones to separate sensitive receptors from sources of air toxic contaminants and odors. In April 2005, the CARB released the final version of the Air Quality and Land Use Handbook, which is intended to encourage local land use agencies to consider the risks from air pollution prior to making decisions that approve the siting of new sensitive receptors (e.g., homes or daycare centers) near sources of air pollution. Unlike industrial or stationary sources of air pollution, siting of new sensitive receptors does not require air quality permits, but could create air quality problems. The primary purpose of the document is to highlight the potential health impacts associated with proximity to common air pollution sources, so that those issues are considered in the planning process. CARB makes recommendations regarding the siting of new sensitive land uses near freeways, truck distribution centers, dry cleaners, gasoline dispensing stations, and other air pollution sources. These "advisory" recommendations, summarized in **Table 4.8-5**, are based primarily on modeling information and may not be entirely reflective of conditions in Napa County. Siting of new sensitive land uses within these recommendation distances may be possible, but only after site-specific studies are conducted to identify the actual health risks. CARB acknowledges that land use agencies have to balance other siting considerations such as housing and transportation needs, economic development priorities and other quality of life issues.

TABLE 4.8-5
CARB RECOMMENDED SETBACK DISTANCES FOR COMMON SOURCES OF TOXIC AIR CONTAMINANTS

Source Type	Recommended Buffer Distance
Freeways and busy arterial roadways	500 feet
Distribution Centers with 100 or more daily truck trips or 40 daily truck trips that use refrigeration units	1,000 feet
Dry cleaners (onsite dry cleaning)	300 feet for any dry cleaning operation At least 500 feet for operations with 2 or more machines
Large gasoline stations	50 feet for typical gas stations Up to 300 feet for large gas stations

Source: CARB 2005

LOCAL

At the local county level, air quality is managed through land use and development planning practices. These practices are implemented in Napa County through the general planning process (i.e., Napa County General Plan). At the regional level, the BAAQMD is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws.

4.8.3. IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

An air quality impact is considered significant if implementation of the General Plan Update would result in any of the following (based on State CEQA Guidelines Appendix G):

1) Conflict with or obstruct implementation of the applicable air plan;

2) Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

3) 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;

4) Expose sensitive receptors to substantial pollutant concentrations;

5) Create objectionable odors affecting a substantial number of people; or

6) An increase in greenhouse gas emissions would be considered significant if the project would result in a substantial increase in emissions due to energy use and/or vehicle miles traveled that cannot be off-set by other reductions. (It should be noted that neither Napa County, BAAQMD or ARB have established significance criteria in relation to greenhouse gas emissions associated with general plans).

The State CEQA Guidelines states that, where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. The Bay Area Air Quality Management District has developed guidelines and thresholds of significance for local plans. Inconsistency with the most recently adopted Clean Air Plan (CAP) is considered a significant impact. According to the BAAQMD, the following criteria must be satisfied for a local plan to be determined to be consistent with the CAP and not have a significant air quality impact:

1) The local plan should be consistent with the CAP population and Vehicle Miles Traveled (VMT) assumptions. This is demonstrated if the population growth over the planning period will not exceed the values included in the current CAP, and

2) The local plan demonstrates reasonable efforts to implement the Transportation Control Measures (TCMs) included in the CAP that identify cities as implementing agencies.

3) For local plans to have a less than significant impact with respect to potential odors and/or toxic air contaminants, buffer zones should be established around existing and proposed land uses that would emit these air pollutants.

In addition, the plans should not lead to development that would lead to violations of ambient air quality standards.

METHODOLOGY

The air quality analysis is based on an evaluation of the General Plan Update to current air quality planning projections, consideration of Clean Air Plan TCMs, an evaluation of potential land use conflicts between sources of air pollution or odors and sensitive receptors, prediction of air pollutant concentrations along roadways, and an evaluation of particulate matter emissions. The technical air quality analysis prepared by Illingworth & Rodkin calculated increases in regional criteria air pollutants by modeling future air quality levels using the URBEMIS 2002 (version 8.7) computer program. Future traffic-related emissions were based on the traffic analysis conducted for the General Plan Update by Dowling Associates. The air quality modeling data is included in **Appendix E**. Estimations of potential increases in greenhouse gas emissions are also provided in this analysis and generally compared to the goals of AB 32 in regards to reduction in greenhouse gas emissions.

PROJECT IMPACTS AND MITIGATION MEASURES

Consistency with Air Quality Regulations

Impact 4.8.1 **Implementation of the General Plan Update would not be consistent with the Clean Air Plan (CAP) since County population and employment projections would exceed regional growth projections prepared by ABAG and projected VMT would increase at a faster rate than the population. Land uses and development would result in increased emissions of ozone precursors resulting primarily from vehicles. The increased emissions would exceed the BAAQMD thresholds. In addition, the General Plan Update would not fully support the Clean Air Transportation Control Measures that Cities and Counties are identified as having a role in implementing. (Significant and Unavoidable – All Alternatives)**

As noted under the "Existing Setting" and "Regulatory Framework" subsections of this Draft EIR section, the SFAAB (which includes Napa County) is in nonatttainment for ozone under federal and state air quality standards. In response, the BAAQMD have developed the Ozone Attainment Plan and the associated CAP to address ozone. The following general impact discussion applies to all three alternatives associated with consistency with the CAP.

Clean Air Plan Assumptions

A key element in air quality planning is to make reasonably accurate projections of future human activities that are related to air pollutant emissions. When the *Bay Area 2005 Ozone Strategy*[1] was developed for the Bay Area it utilized the most recent projections developed by the Association of Bay Area Governments (ABAG) and vehicle activity projected by the Metropolitan Transportation Commission (MTC). These projections are based on the most recent projections using land use designators developed by cities and counties through the General Plan process. Dowling and Associates provided projections of population and VMT growth associated with the General Plan Update. These projections are compared to future year forecasts made by MTC and ABAG, which were used by the BAAQMD for developing the latest Clean Air Plan emissions inventories.

[1] Bay Area Air Quality Management District. 2006. Bay Area 2005 Ozone Strategy. January.

Consistency with Clean Air Plan Projections

Vehicle miles traveled (VMT) is the total number of peak hour trips times the total number of miles traveled between trip origins and destinations. **Table 4.8-6** reports the VMT and population for the existing condition and the year 2030. Projections are provided for Alternatives A, B, and C. The projections for Alternatives A, B, and C are provided for PM Peak Hour VMT for the existing condition, the year 2030 model without roadway improvements and the VMT results for each of the other analysis scenarios. The VMT reported in **Table 4.8-6** is for all trips that start and end within Napa County plus those trips which either start or end within Napa County and have destinations or origins outside of the County. The VMT results do not include any external-to-external trips, which travel through the County. As shown in the table, the projected VMT under all alternatives in 2030 would be substantially higher than existing VMT, even if there are no substantive policy changes to the General Plan (represented by Alternative A). The increase in VMT would be greatest with Alternative C.

TABLE 4.8-6
PROJECTED POPULATION AND VMT GROWTH IN NAPA COUNTY BY YEAR 2030

General Plan Update Alternative	Unincorporated Population/ Increase	Napa County Population/ Increase	VMT[1] Without Proposed GP Roadway Improvements	VMT [1] With Proposed GP Roadway Improvement	VMT[1] Increase
Existing Conditions	27,186	124,994	196,025	–	–
Alternative A	32,199 / 18%	147,007 / 18%	480,821	–	145%
Alternative B	36,215 / 33%	151,023 / 21%	485,363	505,144	129-158%
Alternative C	45,249 / 66%	160,057 / 28%	491,301	525,061	135-168%

[1] *VMT was only forecasted for unincorporated portions of the County.*
Source: KMA 2006, ABAG 2005, Dowling and Associates 2006 from Napa-Solano County Travel Demand

Population growth under all General Plan Update alternatives is projected to exceed ABAG forecasts, which indicate a countywide population of 153,500 people in 2030. However, as noted in Section 4.3 (Population/Housing/Employment), these growth projections for the General Plan Update alternatives are conservative or deliberately large so that the analysis shows a greater rather than less impact. The growth projections are not intended to be requirements for growth to occur by the year 2030. MTC forecasts, which use ABAG projections, indicate that VMT in the entire County would increase by about 42 percent in 2030. The rate of VMT increase for the unincorporated County under all General Plan Update alternatives would exceed both the rate of ABAG forecasted and General Plan forecasted population growth. In addition, the General Plan Update forecasts the rate of VMT growth that exceeds MTC forecasts. The Clean Air Plan relies on ABAG population and MTC vehicle travel forecasts to predict future emissions in the Bay Area. The greater increases anticipated under the General Plan Update would increase emissions and possibly hinder the region's ability to make progress in attaining and maintaining the State Ozone standard. Delays in progress toward attaining the standard could result in the adoption of more stringent air pollution control measures throughout the region, and possibly, threaten funding for transportation projects. Although the Clean Air Plan is meant to address the region's progress in attaining and maintaining ambient air quality standards for ozone, the measures included in the plan would also reduce emissions that lead to regional concentrations of PM_{10} and $PM_{2.5}$. This would be a significant impact for all General Plan Update alternatives, as discussed further below.

The ABAG projections used for regional planning purposes warrant some discussion. Approximately every two years, ABAG produces a set of projections for employment, households and population growth for the jurisdictions within the nine Bay Area counties. ABAG projections are used by MTC and the BAAQMD to prepare transportation and air quality plans. The most recent ABAG projections were issued in 2003 and 2005. Beginning with the 2003 projections, ABAG re-evaluated its projection assumptions to reflect the use of "smart growth" policies in the Bay Area. Smart growth encourages infill development and intensification of already developed areas as opposed to lower density growth on undeveloped lands. Assuming the application of smart growth policies in the future, ABAG's 2003 and 2005 projections allocate the highest levels of growth in and around already developed areas and cities. This policy framework produced a major change in the Napa County projections compared to the prior 2002 Projections. The result was a decrease in projected growth of housing in Napa County with even lower growth projected to take place in unincorporated areas.

For many years, Napa County has implemented what are now called "Smart Growth" policies (e.g., Measure J). County actions or changes to policies over the 2002 to 2005-period did not cause the substantial change in ABAG's projection. The change by ABAG is a result of changes to ABAG's regional allocation model assigning most growth to existing urban areas. KMA (2006) compared 2002 and 2005 ABAG projections to the General Plan alternatives and the "County Limit" for housing. Under the implementation of Measure A (Housing Allocation Program), the "County Limit" assumes growth limitations and housing residual stocks that would allocate the number of housing units that could be constructed over the General Plan Update build-out period. Interestingly, the existing General Plan would be consistent with the 2002 ABAG projections, but exceeds 2005 projections and 2003 Projections. The 2005 Bay Area Ozone Strategy used the 2003 Projections, and therefore, incorporated ABAG's "Smart Growth" assumptions that may underestimate future housing in Napa County.

Support for Clean Air Transportation Control Measures

Bay Area 2005 Ozone Strategy includes 19 Transportation Control Measures (TCMs) to be implemented from the 2000 Clean Air Plan. Cities and counties are identified among the implementing agencies for seven of the TCMs.

Table 4.8-7 lists those TCMs that the County has identified as included in the existing (1983) General Plan policies and implementing measures. Descriptions of the existing (1983) General Plan policies or implementation measures that support each of those TCMs are provided below. Applicable policies that are not part of the 1983 General Plan are noted in italics. No existing General Plan policies or implementation measure supports TCM #20.

TABLE 4.8-7
TRANSPORTATION CONTROL MEASURES (TCMS) SUPPORTED BY THE EXISTING (1983) GENERAL PLAN

Transportation Control Measure	Description of TCMs Support by 1983 General Plan
TCM #1 Support Voluntary Employer-Based Trip Reduction Programs	Work cooperatively with educational institutions and major employers in developing ridesharing programs, flexible working hours and special shuttle service (IM)
TCM #9 Improve Bicycle Access and Facilities	Develop an integrated system of hiking paths and bicycle lanes where it is safe and financially feasible (Goal 7) Incorporate nonmotorized transportation facilities (hiking paths and bicycle routes) into

Transportation Control Measure	Description of TCMs Support by 1983 General Plan
	circulation plan and development projects. Provide bicycle storage facilities near appropriate public buildings (IM) Provide information to the public on the location of hiking and bicycle routes and implement a bicycle safety program (IM) Ensure that all designed hiking paths and bicycle routes have been implemented. Evaluate effectiveness of bicycle safety program (IM)
TCM #10 Youth Transportation	A bicycle safety program for use in local schools and law enforcement agencies should be developed through a joint participation program including the County, Cities, and Unified School Districts. (7f)
TCM #12 Arterial Management Measures	In light of the projected increase in the use of existing County highways, continue to perform periodical inspections, preventative maintenance, safety betterments and repairs, to the fullest extent possible with existing and projected financial resources. (2g) *(Partially supported by 1983 General Plan)*
TCM #15 Local Clean Air Policies and Programs	Efforts should be made to link local transit services with transit systems in adjacent counties, to meet regional travel needs (3e) To encourage transit and other forms of travel, the County and Cities should encourage developers to participate in transit improvements. Such improvements could provide justification for reducing the number of parking spaces provided for commercial and recreational/tourist oriented development (3g) Require that the design of new development projects facilitate nonmotorized transportation travel and encourage public transit usage (IM) *(Partially supported by 1983 General Plan)*
TCM #19 Improve Pedestrian Access and Facilities	Pedestrian and bicycle access should be integrated into all parking lots and considered in the evaluation of development proposals and public projects (7h) *(Partially supported by 1983 General Plan)*
TCM #20 Promote Traffic Calming	*Not Supported by 1983 General Plan*

IM = Implementation Measure, Number + Letter = Policy from Circulation Element
Source: BAAQMD 2006 for TCMs, Napa County General Plan 1983

In addition to anticipated increases in population and vehicle miles traveled, operations and aircraft use at the Napa County Airport are anticipated to increase as well. Aircraft emissions will increase in the County as a result, but at a lower rate due to the improvements in aircraft emission rates. The County's Draft Napa County Airport Master Plan forecasts modest growth in annual aircraft operations between 2003 through 2023.[2] The BAAQMD and CARB include aircraft emissions in planning emission inventories for the Clean Air Plan using the latest projections provided in airport master plans.

[4] *County of Napa, Draft Napa County Airport Master Plan, August, 2003.*

Alternative A

As shown in **Table 4.8-6**, the population increase in the unincorporated County would be the lowest for Alternative A as compared to the existing conditions (2005). Slow growth would be expected to occur as per the Land Use Map in the 1983 General Plan. However, the rate of VMT growth would still be expected to exceed MTC forecasts. In addition, although the existing (1983) General Plan includes some support of the 19 TCMs to be implemented from the 2000 Clean Air Plan, full support is not provided even if these General Plan policies were carried over to the General Plan Update. The mitigation measures below would reduce the CAP inconsistency and lack of TCM support; however, Alternative A would still result in a **significant and unavoidable** impact.

Alternative B

Similar to Alternative A, this alternative would allow development in areas currently designated for urban and rural use. Alternative B would also re-designate some areas to include residential land uses (such as County owned properties in the City of Napa) as well as provide for expanded development opportunities for second units. Under Alternative B, mixed use development would occur at the Pacific Coast/Boca site and the Napa Pipe site. This development/growth potential and proposed roadway improvements (e.g., widening of SR 12 in Jamieson Canyon) would exceed population and VMT projections (see **Table 4.8-6**). While the mitigation measures below would reduce the inconsistency with the CAP, impacts would remain **significant and unavoidable** for this alternative**.**

Alternative C

Similar to Alternatives A, this alternative would allow development in areas currently designated for urban and rural use. Alternative C would also allow similar new residential and mixed use development and roadway improvements as Alternative B. In addition, new development could occur in areas adjacent to urbanized areas with the potential expansion of the so-called "urban bubble" in Angwin as well as potential expansion of development associated with the establishment of a new RUL for the City of American Canyon. This alternative would result in the highest increases in population and VMT of the three alternatives evaluated (see **Table 4.8-6**). The mitigation measures below would reduce the conflict with CAP and lack of TCM support; however, impacts would remain **significant and unavoidable.**

Mitigation Measures

The following mitigation measures shall apply to all alternatives.

MM 4.8.1a The County shall include policy provisions in the General Plan to provide incentives and opportunities for the use of energy-efficient forms of transportation such as public transit, carpooling, walking, and bicycling. This will include the provision and/or the extension of transit to urban areas where development densities (residential and nonresidential) would support transit use, as well as bus turnouts/access, bicycle lockers, and carpool/vanpool parking.

MM 4.8.1b The County shall include a policy in the General Plan that the County shall support intergovernmental efforts directed at stringent tailpipe emissions standards and inspection and maintenance programs for all feasible vehicle classes and revisions to the Air Quality Attainment Plan to accelerate and strengthen market-based strategies consistent with the General Plan.

MM 4.8.1c The County shall include a policy in the General Plan that requires the evaluation of potential project-specific air quality impacts (based on the Bay Area Air Quality Management District's CEQA Guidelines) of new development projects and will require appropriate design (e.g., provision of energy efficiency features in building design), construction (e.g., use of reduced emission construction equipment), operational features (e.g., provision of alternative forms of transportation and use of reduced emission vehicles and equipment), and/or participation in Bay Area Air Quality Management District air quality improvement programs to reduce emissions.

MM 4.8.1d The County shall include a policy in the General Plan that requires all new County vehicles to conform with applicable emission standards at the time of purchase and throughout their use. The County will also purchase the lowest emitting vehicles commercially available to the maximum feasible to meet County vehicle needs.

Implementation of the above mitigation measures and mitigation measures under Impact 4.4.1 in Draft EIR Section 4.4 (Transportation and Circulation) that provide transportation control measures generally consistent with the BAAQMD CAP would assist in reducing emissions from growth in the unincorporated area of the County and would ensure that all relevant and feasible TCMs from the 2005 Ozone Strategy are implemented. However, these mitigation measures are not expected to completely offset anticipated increases in vehicle miles traveled or air pollutant emissions from the three alternatives. Thus, this impact is considered **significant** and **unavoidable** for the proposed General Plan Update under all the alternatives.

Conflicts with Particulate Matter Attainment Efforts

Impact 4.8.2 **Implementation of the General Plan Update would lead to construction and new residential uses that could have wood burning devices. These activities would increase PM_{10} emissions for an area that already exceeds the State ambient air quality standards. (Significant and Unavoidable – All Alternatives)**

The primary sources of fine and respirable particulate matter ($PM_{2.5}$ and PM_{10}) emissions in Napa County from new development are associated with grading, construction and wood smoke. **Table 4.8-8** illustrates the average annual and average winter day PM_{10} wood smoke emissions during the winter season by alternative. Emissions were calculated using the URBEMIS 2002 model based on the number of households for each alternative. The increases in PM_{10} wood smoke emissions identified in **Table 4.8-8** is equivalent to approximately 15 to 20 percent of the current daily PM_{10} emissions in the County, as averaged on an annual basis (Napa County 2005).

New residential construction under all alternatives would lead to increased PM_{10} and $PM_{2.5}$ emissions as a result of wood burning devices installed in these new homes. Wood smoke emissions can be greatly reduced by prohibiting new open fireplaces or woodstoves that do not meet EPA standards or use natural gas.

TABLE 4.8-8
NAPA COUNTY GENERAL PLAN UPDATE WOOD SMOKE EMISSIONS BASED ON AIR QUALITY MODELING

General Plan Update Alternative		Total Number of Residential Units in 2030[1]	PM_{10} Average Annual Emissions (Tons per Day)[2]	PM_{10} Average Winterday Emissions (Tons per Day)[2]
A	Napa County[3] (Unincorporated and Incorporated)	58,219	1.01	4.50
	Unincorporated Napa County	**11,879**	0.21	0.92
B	Napa County (Unincorporated and Incorporated)	60,069	1.04	4.65
	Unincorporated Napa County	**13,529**	0.24	1.05
C	Napa County (Unincorporated and Incorporated)	64,119	1.11	4.96
	Unincorporated Napa County	**17,279**	0.30	1.34

[1] *For discussion on the projected number of households for each alternative, see DEIR Table 4.3-13.*

[2] *Calculated using the URBEMIS2002 Model based on the number of households for each alternative.*

[3] *Existing PM_{10} for Napa County from Residential Fuel Emissions = 0.61 tons per day based on CARB Inventory 2005*

[4] *URBEMIS defaults were used for area emissions sources: Woodstoves @ 34%, Wood fireplaces @ 10%, Natural gas @ 55%. Single-family residential used for all units land use settings. Alt B: 200 units add to incorporated total. Alt C: 500 units added to incorporated total.*

Source: Illingworth & Rodkin 2006

$PM_{2.5}$ and PM_{10} is both a regional and local air quality problem. Based on available Napa monitoring data from 2000 to 2005, the state 24-hour PM_{10} standard was exceeded eight total measured days in Napa County. The annual and 24-hour PM_{10} standards were exceeded throughout the Bay Area during the last three years. Between 2003 and 2005, the Jefferson Street monitoring station recorded one exceedance of PM_{10} state 24-hour standard (10/12/2004). Between 2003 and 2006, the Air Basin's 14 monitoring stations recorded 35 total exceedances. Napa County, accounts for approximately 2.9 percent of the total recorded exceedances at the Air Basin's monitoring stations between 2003 and 2005. The County is not a substantial source of PM emission exceedances for the San Francisco Bay Area Air Basin.

The $PM_{2.5}$ data that exists for the Bay Area indicates that a majority of the stations exceeded the annual CAAQS. The source of emissions that produce PM_{10} and $PM_{2.5}$ is quite complex and not well understood since PM_{10} and especially $PM_{2.5}$ are emitted both directly and indirectly. Dust particles usually contribute to local concentrations due to the large size. Studies conducted by the BAAQMD have found the largest source categories for annual $PM_{2.5}$ and PM_{10} to be on- and off-road vehicle exhaust and carbon from cooking and wood-burning activities. On days when PM_{10} standards are exceeded, $PM_{2.5}$ is estimated to account for up to 90 percent of the PM_{10}. On an annual basis, CARB estimates that $PM_{2.5}$ comprises about 50 percent of the PM_{10} levels. $PM_{2.5}$, which is substantially made up of carbon from cooking and wood smoke, is seen as a significant source of the region's PM_{10} problem. Wood smoke emissions tend to be greatest on fall and winter days and nights when meteorological conditions are conducive to high PM_{10} and $PM_{2.5}$ levels.

Data obtained from BAAQMD from 2000 to 2005 show that PM_{10} exceedances of state 24-hour PM_{10} standards tend to occur in the winter months.[3] Between 2000 and 2006, seven of the eight days the County exceeded state 24-hour PM_{10} standards took place during the winter months (November through February). The data occasionally shows that PM_{10} exceedances in the County can occur in the fall (October 12, 2004) in rural areas due to fires and dust from agricultural activities. Between 2000 and 2006, 28 of the 47 days (approximately 60 percent of the days) the entire San Francisco Bay Area Air Basin exceeded state 24-hour PM_{10} standards took place during the winter months (November through February). PM_{10} exceedances in the County, however, are shown to occur primarily in the winter. These exceedances are generally attributed to use of wood-burning devices. BAAQMD has targeted limiting wood burning as a way to lower wintertime particulate matter emissions as they are the easiest to control.

Alternative A

As shown in **Table 4.8-8**, Alternative A would have the least PM emissions from wood stoves of any of the three alternatives evaluated and would result in an additional [insert] tons per day of PM over existing conditions from this source alone. This is as a result of this alternative having projected residential development of 2,235 dwelling units by year 2030. Wood smoke emissions in the County could conflict with the region's attainment efforts aimed at meeting State particulate matter standards. While the mitigation measures identified below could reduce the projected emissions, the potential increase would still be considered **significant and unavoidable** for this alternative**.**

Alternative B

Similar to Alternative A, this alternative would contribute to smoke emissions in the County that could conflict with attainment efforts with state particulate matter standards. While the mitigation measures identified below could reduce the projected emissions, the potential increase would still be considered **significant and unavoidable** for this alternative**.**

Alternative C

As shown in **Table 4.8-8**, Alternative C would have the greatest PM emissions from wood stoves of the three alternatives evaluated and would result in an additional [insert] tons per day of PM over existing conditions from this source alone. This is as a result of this alternative having projected residential development of 7,635 dwelling units at year 2030. Wood smoke emissions in the County could conflict with the region's attainment efforts aimed at meeting State particulate matter standards. While the mitigation measures identified below could reduce the projected emissions, the potential increase would still be considered **significant and unavoidable** for this alternative**.**

[3] Bay Area Air Quality Management District, Exceedances of the California 24-Hour PM10 Standard for 2000, 2001, 2002, 2003, 2004, and 2005.

Mitigation Measures

The following mitigation measure would apply to all alternatives:

MM 4.8.2 The County shall include the following as a policy in the General Plan:

The County shall seek to reduce particulate emissions and avoid exceedences of state PM standards by:

a) Providing information regarding low emitting fireplaces to property owners who are constructing or remodeling homes;

b) Fireplaces or wood stoves in new developments with densities greater than one residential home per acre, shall comply with current EPA emission standards for wood-burning stoves or be fueled by natural gas;

c) Disseminating information in support of the BAAQMD's "Spare the Air Tonight" program when particulate matter exceedances are projected to occur;

d) Disseminating information regarding agricultural burn requirements established by the BAAQMD;

e) Enforcing the winter grading deadlines established to protect water quality; and

f) Requiring implementation of dust control measures during construction and grading activities and enforcing winter grading deadlines.

Implementation of the above mitigation measure and MM 4.8.1a and c would assist in reducing wood smoke emissions associated with the three alternatives generally consistent with current efforts by BAAQMD (e.g., BAAQMD efforts associated with compliance with SB 656). However, implementation of these mitigation measures would not completely offset particulate matter emission increases from growth anticipated under the General Plan Update. Thus, this impact would be **significant and unavoidable** for all three alternatives.

Short-Term Emissions From Grading and Construction

Impact 4.8.3 **Implementation of the General Plan Update may result in grading and increased construction that may impact air quality. These activities would impact air quality by increasing ozone precursor and particulate matter emissions for an area that already exceeds ambient air quality standards, and could also result in the release of hazardous air pollutants associated with diesel emissions, lead and asbestos. (Significant and Mitigable - All Alternatives).**

With or without the General Plan Update, vineyard development is projected to continue in Napa County. As described in Section 4.11, Hydrology and Water Quality, the County expects approximately between 10,000 and 12,500 new acres of vineyards to be developed by year 2030. There would also be other agricultural activities that require grading, and construction of new residential units and commercial uses would involve construction activities that result in air

pollutant emissions. Construction activities such as demolition, grading, construction worker travel to and from project sites, delivery and hauling of construction supplies and debris to and from development sites, and fuel combustion by on-site construction equipment would generate pollutant emissions. These construction activities would temporarily create emissions of dust, fumes, equipment exhaust, and other air contaminants. Dust emissions can lead to both nuisance and health impacts. Particulate matter is the pollutant of greatest concern that is emitted from construction, particularly during site preparation and grading. Particulate matter emissions from construction can vary daily, depending on various factors, such as the level of activity, type of construction activity taking place, the equipment being operated, weather conditions, and soil conditions. Construction-related activities are generally short term in duration, and the BAAQMD does not recommend any significance criteria for their associated emissions. Instead, the BAAQMD bases the determination of significance on a consideration of the control measures to be implemented. If all appropriate emissions control measures recommended by the BAAQMD CEQA Guidelines are implemented for a project, then construction emissions are not considered significant[4]. In addition to utilization of emission control measures, implementation of the Napa County Conservation Regulations require the development of erosion control plans that address soil erosion and reduce the generation of dust from agricultural projects on slopes greater than 5%.

Off-road construction equipment is a large source NOx and diesel particulate matter in the Bay Area. NOx is an ozone precursor pollutant that contributes to regional ozone formation. Diesel particulate matter contributes to elevated PM_{10} and $PM_{2.5}$ concentrations in the County and is considered a toxic air contaminant. For these reasons, the BAAQMD recommends that reasonable control measures are implemented for construction or grading projects that reduce these emissions. The BAAQMD CEQA Guidelines considers emissions from these activities to be less than significant if appropriate control measures are implemented.

The BAAQMD and CARB have regulations that address the handling of hazardous air pollutants such as lead and asbestos. Lead and asbestos emissions could occur from demolition activities of buildings and asbestos emissions could occur from disturbance of soils with naturally occurring asbestos. Asbestos is also known as Chrysotile and is known to occur naturally in serpentine mineral deposits within several areas of the County. Chrysotile is recognized as a carcinogen and has not been mined in the County since the mid 1940s. Serpentine mineral deposits and soils are known to exist and areas northeast of the City of Napa, as well as, Oat Hill Quarry and American Canyon Quarry located in southern Napa County (Napa County, BDR 2005). BAAQMD rules and regulations address the both the handling and transport of these contaminants. An air toxic control measure adopted by CARB requires measures to minimize asbestos emissions in areas known to have naturally occurring asbestos. The BAAQMD should be consulted prior to handling materials that contain hazardous contaminants such as lead or asbestos or disturbing ground where soils with asbestos exist. Section 4.10 (Geology and Soils) discusses mineral resources, BAAQMD asbestos regulations, and the impacts of naturally occurring asbestos.

The following impact discussion identifies impacts unique to each alternative.

[4] Bay Area Air Quality Management District. 1999. BAAQMD CEQA Guidelines - Assessing the Air Quality Impacts of Projects and Plans. April 1996, revised December.

Alternative A

Under Alternative A, new housing construction would be distributed throughout the County for a total of 2,235 units under the land use map from the 1983 General Plan as well as nonresidential growth anticipated by year 2030. Continued development of vineyards (10,000 to 12,500 acres) could also occur with no change to existing County regulations or policies. As identified above, these activities under this alternative could result in temporary emissions of ozone, particulate matter and toxic air pollutants (diesel, lead, asbestos). This impact is considered **significant and mitigable** with the application of mitigation measures identified below**.**

Alternative B

Similar to Alternative A, Alternative B would result in new residential development (3,885 dwelling units) and nonresidential growth by year 2030 as well as the anticipated development of 10,000 to 12,500 acres of new vineyards. In addition, this alternative includes the construction of roadway improvements in the southern portion of the County, extension of recycled water to Coombsville and Carneros and policy provisions under the proposed General Plan Update that would involve the construction of new trails and potential passive recreation facilities (as proposed under the Recreation and Open Space Element). These activities under this alternative could result in temporary emissions of ozone, particulate matter and toxic air pollutants (diesel, lead, asbestos). This impact is considered **significant and mitigable** with the application of mitigation measures identified below**.**

Alternative C

Alternative C would result in a similar development pattern as Alternative B, with the exception of an increased development potential (e.g., 7,635 new dwelling units by year 2030) and the expansion of rural and urban uses in the unincorporated community of Angwin and establishment of a new RUL for the City of American Canyon (the reader is referred to Section 3.0, Project Description, for a complete description of this alternative). In addition, this alternative also includes the construction of roadway improvements in the southern portion of the County, extension of recycled water to Coombsville and Carneros and policy provisions under the proposed General Plan Update that would involve the construction of new trails and potential passive recreation facilities (as proposed under the Recreation and Open Space Element). These activities under this alternative could result in temporary emissions of ozone, particulate matter and toxic air pollutants (diesel, lead, asbestos). This impact is considered **significant and mitigable** with the application of mitigation measures identified below**.**

Mitigation Measures

The following mitigation measures would apply to all three alternatives:

MM 4.8.3a The County shall include a General Plan policy that requires the following dust control measures be applied to discretionary projects as appropriate. These measures are consistent with those recommended for use by the BAAQMD.

a) For all construction and similar earth disturbing activities:

- Apply water on all active construction areas at least twice daily and more often when conditions warrant.
- Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard.

- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites daily as needed to control dust.
- Sweep all paved access roads, parking areas, and staging areas at construction sites and sweep streets daily if visible soil materials is carried onto adjacent public streets.
- Implement the Napa County Conservation Regulations (Chapter 18.108 of County Code) where these regulations are applicable.

b) For sites greater than 4 acres in size:

- Hydroseed or apply (non-toxic) soil stablizers to inactive construction areas.
- Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.)
- Limit traffic speeds on unpaved roads to 15 miles per hour.
- Install appropriate erosion control measures to prevent silt runoff to public roadways.
- Replant soil stabilizing vegetation in disturbed areas as quickly as possible.

c) For sites that are located adjacent to sensitive receptors or warrant additional controls:

- Install wheel washers for all exiting trucks, or wash off all trucks and equipment leaving the site.
- Suspend grading activities when winds exceed 25 miles per hour (mph) and visible dust clouds cannot be prevented from extending beyond active construction areas.
- Limit the area subject to excavation, grading and other construction activities at any one time.

MM 4.8.3b The County shall include a General Plan policy that requires that applicants seeking demolition permits to demonstrate compliance with applicable BAAQMD requirements involving lead paint and asbestos containing materials (ACMs) designed to mitigate exposure to lead paint and asbestos.

MM 4.8.3c The County shall include a General Plan policy that requires the development of maps identifying areas known and/or suspected to contain naturally occurring asbestos and shall require the use of enhanced dust suppression requirements and air quality monitoring (if determined necessary by the County and BAAQMD) for grading and construction projects consistent with applicable BAAQMD requirements to protect the public from exposure.

MM 4.8.3d The County shall include a General Plan policy that requires the utilization of construction emission control measures recommended by BAAQMD that are appropriate for the specifics of the project (e.g., length of time of construction and distance from sensitive receptors). This may include the utilization of low emission construction equipment, restrictions on the length of

time of use of certain heavy-duty construction equipment, and utilization of methods to reduce emissions from construction equipment (alternative fuels, particulate matter traps and diesel particulate filters). These measures shall be made conditions of approval and/or mitigation to projects to ensure implementation.

Implementation of the above mitigation measures, compliance with the BAAQMD CEQA Guidelines and the temporary nature of these emissions would ensure that this impact is reduced to **less than significant** for all alternatives.

Odors

Impact 4.8.4 **Implementation of the General Plan Update may locate new sensitive receptors near existing or future sources of odors. In addition, existing sensitive receptors could be affected by new sources of odors developed under the General Plan Update. (Significant and Mitigable - All Alternatives).**

According to BAAQMD CEQA Guidelines, for a general plan to have a less than significant impact with respect to odors buffer zones should be established around existing and proposed land uses that would emit these air pollutants. Buffer zones to avoid odor impacts should be reflected in local plan policies, land use maps, and implementing ordinances. Proposed land use maps for the General Plan Update were examined and compared with locations of known sources of odors. In addition, General Plan policies that protect sensitive receptors from these air pollutant sources were identified.

Implementation of the General Plan Update (under all alternatives) may involve the placement of sensitive receptors (e.g., new residences) near wastewater treatment ponds, composting facilities, sanitary landfills or transfer facilities, or similar uses. Localized sources of odors could include painting/coating operations or restaurants, including fast-food restaurants. BAAQMD (1999) provides project screening trigger levels for potential odor sources. To avoid significant impacts, the BAAMQD CEQA Guidelines recommend that buffer zones to avoid odors and adverse impacts should be reflected in local plan policies, land use maps, and implementing ordinances. Appropriate buffer zones should be established during discretionary project review. This would be a significant impact for all General Plan Update alternatives**.** The County's Right to Farm Ordinance (Chapter 2.94, County Code) protects the routine operational activities required to conduct agricultural activities, which would include odor issues (the reader is referred to Section 4.1 (Agriculture, for a further discussion of County's Right to Farm Ordinance.

Alternative A

The land use map for Alternative A could result in new odor sensitive land uses (e.g., residences) near sources of existing and future odors. This alternative would also not preclude establishment of new odor sources in proximity to existing residences. (While development and construction of new vineyards and wineries could also occur near sensitive receptors, these odors are considered by the County as part of agriculture and are protected through the County's Right to Farm Ordinance.) As noted above, BAAQMD recommends the use of buffer zones, and this impact is considered **significant and mitigable** with the application of mitigation measures identified below**.**

Alternative B

Similar to Alternative A, this alternative could result in new odor sensitive land uses (e.g., residences) near sources of existing and future odors. Alternative B would also place residential uses within areas of existing development and industrial areas that could be exposed to odors beyond what would be anticipated under Alternative A. This impact is considered **significant and mitigable** with the application of mitigation measures identified below**.**

Alternative C

Alternative C would result in similar odor impact exposure issues as Alternative B, given the similarities in their proposed land use maps. This impact is considered **significant and mitigable** with the application of mitigation measures identified below**.**

Mitigation Measure

The following mitigation measure shall apply to all alternatives.

MM 4.8.4 The County shall include a General Plan policy that requires:

- When new development that would be a source of odors is proposed near residences or sensitive receptors, either adequate buffer distances shall be provided (based on recommendations and requirements of the California Air Resources Control Board and BAAQMD), or filters or other equipment shall be provided to reduce the potential exposure to acceptable levels. Potential mitigation associated with this policy requirement will be coordinated with any required permit conditions from BAAQMD.

- When new residential or other sensitive receptors are proposed near existing sources of odors, either adequate buffer distances shall be provided (based on recommendations and requirements of the California Air Resources Control Board and BAAQMD), or filters or other equipment shall be provided to the source to reduce the potential exposure to acceptable levels.

Implementation of the above mitigation measure would ensure that subsequent development under the proposed General Plan Update is siting and/or designed to avoid exposure to offensive odors (in coordination with BAAQMD). Thus, this impact would be **less than significant** for all alternatives.

Exposure to Air Toxic Contaminants

Impact 4.8.5 **Implementation of the General Plan Update may locate new sensitive receptors near existing or future sources of toxic air contaminants (TACs). In addition, existing sensitive receptors could be affected by new sources of toxic air contaminants developed under the General Plan Update. (Significant and Mitigable - Alternative A, Significant and Unavoidable – Alternatives B and C).**

The placement of sensitive receptors (e.g., new residences) near freeways, truck distribution centers, large warehouses, large gasoline fueling stations, heavy industrial sites, corporation yards, bus stations, quarries and dry cleaners are typical situations where sensitive receptors could be exposed to toxic air contaminants (TACs). The California Air Resources Board (2005)

has published recommended setback distances for sensitive receptors and sources of toxic air contaminants. To avoid significant impacts, the BAAMQD CEQA Guidelines recommend that buffer zones to avoid adverse impacts from toxic air contaminants should be reflected in local plan policies, land use maps, and implementing ordinances. Appropriate buffer zones should be established during discretionary project review. It should also be noted that stationary sources of TACs are required to obtain permitting from BAAQMD, which considers the health and risk associated with emissions on sensitive receptors.

Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. The County does not have major sources of TACs; there are no major highways and there are no significant industrial processes. State Route 29 and The Napa County Airport is the largest source of current TACs in the County and, therefore, the areas adjacent to these sources are the only major concentration of TACs.

Alternative A

While it is anticipated that future land uses that could be sources of TACs would be located primarily in industrial designated areas adjacent to the Napa County Airport, the land use map for Alternative A could result in sensitive land uses (e.g., residences) near future sources of TACs. This impact is considered **significant and mitigable** with the application of mitigation measures identified below**.**

Alternative B

Similar to Alternative A, it is anticipated that future land uses that could be sources of TACs would be located primarily in industrial designated areas adjacent to the Napa County Airport, however, the land use map for Alternative B could result in sensitive land uses (e.g., residences) near future sources of TACs. This could especially occur in areas where Alternative B proposes residential uses within existing developed areas and industrial areas (e.g., Napa Pipe site and Pacific Coast/Boca sites) as well as the expansion of state highways in the County (e.g., State Route 12 to four lanes in Jamieson Canyon). This impact can be reduced through mitigation, but may remain **significant.**

Alternative C

Alternative C would result in similar TAC impact exposure issues as Alternative B, given the similarities in their proposed land use maps. This impact can be reduced through mitigation, but may remain **significant**.

Mitigation Measure

The following mitigation measure shall apply to all alternatives.

MM 4.8.5 The County shall include a General Plan policy that requires:

- When new development that would be a source of TACs is proposed near residences or sensitive receptors, either adequate buffer distances shall be provided (based on recommendations and requirements of the California Air Resources Control Board and BAAQMD), or filters or other equipment shall be provided to reduce the potential exposure to acceptable levels. Potential

mitigation associated with this policy requirement will be coordinated with any required permit conditions from BAAQMD.

- When new residential or other sensitive receptors are proposed near existing sources of TACs, either adequate buffer distances shall be provided (based on recommendations and requirements of the California Air Resources Control Board and BAAQMD), or filters or other equipment shall be provided to the source to reduce the potential exposure to acceptable levels.

Implementation of Mitigation Measure MM 4.8.5 would ensure that subsequent development under the proposed General Plan Update is sited and/or designed to avoid or to minimize exposure to TACs. This impact would be **less than significant** for Alternative A, however, Alternatives B and C include the widening of State Route 12 in Jamieson Canyon (as well as other improvements) that could move a mobile source of TACs closer to existing sensitive receptors. Given that the exact alignment of proposed roadway improvements in relation to sensitive receptors is not known and the ability to meet recommended setbacks of the ARB (500 feet from high traffic roadways – California Air Resources Control Board Air Quality and Land Use Handbook, A Community Health Perspective 2005), this impact is considered **significant and unavoidable** for Alternatives for B and C.

Carbon Monoxide Concentrations along Roadways

Impact 4.8.6 **Future growth in traffic could cause increases to carbon monoxide levels along County roadways. However, overall concentration would remain below health-based ambient air quality standards. (Less Than Significant - All Alternatives).**

Congested intersections with a large volume of traffic have the greatest potential to cause high-localized concentrations of carbon monoxide. Since the early 1990s, carbon monoxide levels have been at healthy levels (i.e., below State and federal standards) in the Bay Area. As a result, the region has been designated as attainment for the standard.

Carbon monoxide emissions from traffic along major roadway segments with high traffic volumes and poor level of service (LOS) were evaluated. This included the busiest County roadway segments operating at LOS of D, E, or F. The traffic-generated emissions of CO were predicted using a screening version of the Caline4 line source dispersion model developed by the BAAQMD. The model requires inputs of geometry, traffic volumes, emission factors and meteorology. Existing traffic volumes for selected roadway segments were used. Emission factors used were calculated using the EMFAC2002 model, developed by the California Air Resources Board, with default assumptions for Napa County during winter when carbon monoxide levels are highest. Meteorological conditions indicative of elevated CO levels in the Bay Area were used, which include a low wind speed of 1 meter per second, worst-case wind angle, F stability, and a temperature of 45°F. Slow speeds of 5-15 miles per hour for roadways (depending on LOS) and 35 miles per hour for the freeway segments were used to develop the emission factors. The screening assessment is a worst-case analysis, designed to over-predict carbon monoxide levels. A refined approach that involves use of a dispersion model is used where screening results indicate high concentrations that may result in adverse impacts. The worst study roadway links in the County, which include highest traffic volumes and high levels of congestion, were modeled to assess roadside carbon monoxide concentrations. These intersections along with the modeled concentrations are shown in **Table 4.8-9**. Eight-hour concentrations were modeled since they represent the most prohibitive standard. Exceedance of the 1-hour NAAQS or CAAQS would result in an exceedance of the 8-hour standard.

Although levels may differ slightly along these roadways, the overall concentrations would be well below health-based ambient air quality standards for 8-hour exposures. Since modeled concentrations would not exceed the 8-hour standard, they would not exceed the 1-hour standard. The County's worst intersection, in terms of roadside air pollutant concentrations, has levels that are currently below ambient air quality standards. The concentrations are anticipated to decrease substantially in the future with improvements to exhaust systems and reformulated fuels.

TABLE 4.8-9
MODELED 8-HOUR CARBON MONOXIDE CONCENTRATIONS ALONG MAJOR NAPA COUNTY ROADWAYS FOR DIFFERENT ROADWAY IMPROVEMENT SCENARIOS FOR YEAR 2030 BY ALTERNATIVE (IN PPM)

Roadway Segment	Without Proposed General Plan Update Roadway Improvements			With Proposed General Plan Update Roadway Improvements	
	A	B	C	B	C
SR 29 at American Canyon	3.0	3.0	3.0	2.9	2.9
SR 29 at Highway 12	2.9	3.0	3.0	3.4	3.4
SR 29/12 near Highway 221	2.9	2.9	3.0	3.1	3.2
SR 29/12 at Highway 121	2.9	2.9	2.9	3.0	3.0
SR29 south of Imola Ave.	2.6	2.6	2.6	2.6	2.6
SR 29 at Oakville Cross Road	2.6	2.6	2.6	2.6	2.6
SR 29 at Deer Park Road	2.6	2.6	2.6	2.6	2.6

8-Hour Carbon Monoxide Standards: Federal = 9 ppm, State = 9.0 ppm.
Source: Illingworth & Rodkin 2006.

Alternative A

As shown in **Table 4.8-9,** carbon monoxide concentrations along major roadways would not exceed the 1-hour or 8-hour carbon monoxide standards of NAAQS or CAAQS. The impact would be considered **less than significant.**

Alternative B

As shown in **Table 4.8-9,** carbon monoxide concentrations along major roadways would not exceed the 1-hour or 8-hour carbon monoxide standards of NAAQS or CAAQS with or without propose General Plan Update roadway improvements. The impact would be considered **less than significant.**

Alternative C

As shown in **Table 4.8-9,** carbon monoxide concentrations along major roadways would not exceed the 1-hour or 8-hour carbon monoxide standards of NAAQS or CAAQS with or without propose General Plan Update roadway improvements. The impact would be considered **less than significant.**

Mitigation Measure

None required.

Potential Increase in Long-Term Atmospheric Greenhouse Gas Emissions

Impact 4.8.7 Implementation of the proposed General Plan Update would contribute to an increase in Greenhouse Gas (GHG) emissions from vehicle transportation, building energy use and possibly agricultural operations and may contribute to increases in atmospheric GHG concentrations. Higher concentrations of GHGs have been linked to the phenomenon of climate change. (Significant and Unavoidable – All Alternatives)

As described above under the "Existing Setting" sub-section, increases in greenhouse gas emissions in the State and the County could contribute to increases in global average temperatures and climate change. Climate change in turn could lead to sea level rise and other changes in environmental conditions.

The major sources of GHG emissions in Napa County are vehicle transportation, building energy use, and to a lesser extent agricultural operations (including livestock grazing and emissions produced during wine-making)[5]. The BAAQMD Source Inventory of Bay Area Greenhouse Gas Emissions (2006) identifies that in year 2002, the Bay Area emitted approximately 85.4 million tons of CO_2-equivalent greenhouse gases, of which Napa County was the lowest contributor at 1.4 million tons (1.4% of the total Bay Area emissions). Projected population growth and an increase in the County's wine making operations, resulting from implementation of the General Plan Update, may lead to an increase in GHG emissions. Research and experience indicate that increased population and industrial activities result in an increase in GHG emissions. Increased GHG emissions from the unincorporated portion of the County (in combination with emissions from the cities in the County and surrounding counties) are expected from these sectors by the year 2030, which could conflict with the state efforts to reduce GHG emissions to 1990 levels as set forth in AB 32. The potential increase in GHG emissions from Napa County's major sources by alternative is identified below.

Alternative A

With no substantive policy changes, Alternative A would allow development to proceed under policies similar to the existing 1983 General Plan. Thus, development would be directed at the existing cities and designated -- already developed -- areas of the unincorporated County.

Vehicle transportation is one of the major contributors to GHG emissions in Napa County. Vehicle emissions primarily consist of CO_2 from the tailpipe during vehicle operation. Since the amount of miles traveled is directly proportional to the amount of GHG emissions emitted, vehicle miles traveled (VMT) is a good indicator of totals GHG emissions from vehicle operations in the County. Alternative A would have total VMT during PM Peak Hour that is expected to increase from 196,025 in 2005 to 480,821 in 2030 (see Section 4.4, Transportation and Circulation for discussion on the VMT analysis). This includes traffic generated in the unincorporated County,

[5] Environmental Protection Agency, AP 32, Fifth Edition Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, 9.12.2.3, October, 1995.

the cities within the County and locations outside of the County and is not solely the result of County land uses under the General Plan Update. Assuming an emission factor for future CO_2 emissions from vehicles of approximately 366 grams CO_2/mile (From the California Air Resources Board in 2002), approximately 104.2 additional metric tons (229,722 pounds) of CO_2 would be generated during the PM Peak Hour (total VMT). This does not include external trips that only travel through the County without starting or stopping there. (It is important to note that less than ¼ of the total trips in the County both originate and terminate from unincorporated portions of the County.) In general, the PM Peak Hour is thought to represent about 10% of daily vehicle traffic.

The EPA's Personal Greenhouse Gas Calculator demonstrates the average household in Napa County (2.57 people) emits approximately 19.4 metric tons (42,802 pounds) of GHG per year (primarily CO_2 emissions from energy use). Assuming anticipated growth of 2,235 dwelling units by 2030 under Alternative A, the County could potentially increase its annual GHG emissions from households by 4,341 metric tons (9.6 million pounds).

Commercial, industrial and institutional buildings are a more significant source of GHG emissions than households. This is primarily from CO_2 emissions as a result of energy use. A more detailed GHG inventory would calculate the total building stock and resultant emissions from commercial, industrial and institutional buildings in the County, although this is more than can be accurately done in a General Plan Update EIR. Nonetheless, it is clear that continued growth within the unincorporated portion of the County (regardless of whether the General Plan is updated) is likely to lead to more GHG emissions by year 2030. Growth in agricultural production could also contribute to GHG emissions in Napa County.

In addition to these major sources of GHG emissions, the County also includes natural processes for GHG sequestration (processes that remove GHGs from the atmosphere). These mostly include CO_2 sequestration from forests and agricultural soils. CO_2 sequestration from forests and agricultural soils varies on a species by species basis, under different levels of atmospheric CO_2 and with inter-annual climatic variability (i.e. year-to-year temperature and precipitation differences). Therefore, a more detailed analysis would be needed to determine the overall sequestration potential of the County's forests and agricultural soils as well as any net affect associated with conversions of forested land to vineyards. It is important to note that, while agricultural soils are a net sequester of CO_2, agricultural operations, in general are, a net emitter of GHGs (CO_2-equivalent). This is due to emissions of nitrous oxide and methane (other GHGs) associated with agricultural processes which outweigh the CO_2 sequestration by the soils According to the U.S. Department of Agriculture's Agriculture and Forestry Greenhouse Gas Inventory: 1990-2001, agriculture in the U.S. contributed to approximately seven percent (7%) of total GHG emissions in 2001. Of the total agricultural GHG emissions for that year, approximately three percent (3%) were offset by CO_2 sequestration from the soils. Since this was a U.S. study, actual numbers may vary for specific agricultural operations in Napa County. For example, agricultural practices in Napa County involve less mechanical operations for activities like grape harvesting than would be used for other crops like corn or soy.

According to the US Department of Agriculture, improved forest regeneration and management practices such as density control, nutrient management, and genetic tree improvement promote tree growth and result in additional carbon accumulation in biomass. In addition, wood products harvested from forests can serve as long-term carbon storage pools. The adoption of agroforestry practices like windbreaks and riparian forest buffers, which incorporate trees and shrubs into ongoing farm operations, represents a potentially large GHG sequestration opportunity. In addition, agricultural practices such as conservation tillage and grassland practices such as rotational grazing can also reduce carbon losses and promote CO_2

sequestration in agricultural soils. These practices offset CO_2 emissions caused by land use activities such as conventional tillage and cultivation of organic soils.

Agriculture and forestry provide opportunities to reduce GHG emissions through targeted management. Practices to reduce GHG emissions from livestock include modifying energy content of livestock feed, inoculating feed with agents that reduce methane emissions from digestive processes and managing manure in controlled systems that reduce or eliminate GHG emissions. For example, anaerobic digesters are a promising technology for capturing and using methane emissions from livestock waste as an alternative energy source. In addition, GHG emission from soils can be reduced with improved nitrogen use efficiency, involving both reduced nitrogen applications and improved nitrogen uptake by plants.

While mitigation measures are identified below to reduce GHG emissions, this impact is considered **significant and unavoidable** for this alternative.

Alternative B

Alternative B would have a similar impact to Alternative A associated with GHG emissions associated with agricultural activities and non-residential uses. However, this alternative would result in increases in VMT as well as residential development potential.

VMT under Alternative B would increase from 196,025 in 2005 to 449,681 in 2030 in the PM Peak Hour (without proposed General Plan Update roadway improvements), which would generate approximately 92.8 additional metric tons (204,673 pounds) of CO_2. With proposed General Plan Update roadway improvements, total VMT during PM Peak Hour is expected to increase from 196,025 in 2005 to 505,144 by year 2030, which would generate approximately 113 additional metric tons (249,426 pounds) of CO_2. As noted under Alternative A, this includes traffic generated in the unincorporated County, the cities within the County and locations outside of the County and is not solely the result of County land uses under the General Plan Update. Assuming anticipated residential growth of 3,885 dwelling units by 2030 under Alternative B, the County could potentially increase its annual GHG emissions from households by 7,546 metric tons (16.6 million pounds).

While mitigation measures are identified below to reduce GHG emissions, this impact is considered **significant and unavoidable** for this alternative.

Alternative C

Alternative C would have a similar impact to Alternative A associated with GHG emissions associated with agricultural activities and non-residential uses. However, this alternative would result in increases in VMT as well as residential development potential.

Year 2030 conditions under Alternative C would have total VMT during PM Peak Hour is expected to increase from 196,025 to 461,038 (without proposed General Plan Update roadway improvements), which would generate approximately 97.0 additional metric tons (213,837 pounds) of CO_2. With proposed General Plan Update roadway improvements, total VMT during PM Peak Hour is expected to increase from 196,025 to 525,061 by year 2030, which would generate approximately 120 additional metric tons (265,496 pounds) of CO_2. As noted under Alternative A, this includes traffic generated in the unincorporated County, the cities within the County and locations outside of the County and is not solely the result of County land uses under the General Plan Update. Assuming anticipated residential growth of 7,635 dwelling units by

2030 under Alternative C, the County could potentially increase its annual GHG emissions from households by 14,829 metric tons (32.7 million pounds).

While mitigation measures are identified below to reduce GHG emissions, this impact is considered **significant and unavoidable** for this alternative.

Mitigation Measures

The following mitigation measures shall apply to all alternatives.

MM 4.8.7a The County shall include a policy in the General Plan that requires the County to conduct a greenhouse gas emission inventory analysis of all major emission sources by the year 2008 in a manner consistent with Assembly Bill 32, and then to seek reductions such that emissions are equivalent to year 1990 levels by the year 2020.

While implementation of the above mitigation measures and mitigation measures MM 4.8.1a through d would assist in reducing these emissions, there are no feasible mitigation measures to fully offset existing and future GHG emissions. Thus, this impact is a **significant and unavoidable** impact for all alternatives considered.

REFERENCES

ARB. *See* California Air Resources Board.

Bay Area Air Quality Management District (BAAQMD). 1999. *BAAQMD CEQA Guidelines - Assessing the Air Quality Impacts of Projects and Plans.* April 1996, revised December.

BAAQMD. 2005. *Particulate Matter Implementation Schedule – Staff Report*. November 9.

BAAQMD. 2006(a). *Bay Area 2005 Ozone Strategy.* January 4, 2006.

BAAQMD. 2006(b). http://www.baaqmd.gov/pio/wood_burning/. [Accessed December 26, 2006.]

BAAQMD. 2006(c). Wood Burning Handbook.

BAAQMD, 2006. *Source Inventory of Bay Area Greenhouse Gas Emissions.* November 2006.

BAAQMD. 2000. *Bay Area Clean Air Plan.* Adopted December 20, 2000.

California Air Resources Board (ARB). 2005. *Air Quality and Land Use Handbook.* April.

California Air Resources Board. 2006a. http://www.arb.ca.gov/ei/maps/statemap/abmap.htm.

California Air Resources Board. 2006b. Area Designation Maps/State and National. Available: www.arb.ca.gov/desig/adm/adm.htm#state. Last updated September 29, 2006. [Accessed January 2007.]

California Energy Commission (CEC). 2006a. *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004.* Publication CEC-600-2006-013-D.

California Energy Commission. 2006b. Climate Change Portal. Available: http://www.climatechange.ca.gov. Last update December 22, 2006. [Accessed January 2007.]

California Energy Commission. 2006c. (July) *Our Changing Climate: Assessing the Risks to California.* Publication CEC-500-2006-077.

CEC. *See* California Energy Commission.

County of Napa, 1998. *Napa County General Plan*. Adopted June 7, 1983, revised December 3, 1998.

County of Napa. 2006. Draft General Plan Update, Circulation Element.

County of Napa. 2006. Draft General Plan Update, Conservation Element.

Keyser Marston Associates, Inc. (KMA) 2006. *Industrial Land Use Study. Napa County General Plan Update - Draft*. May 2006

Metropolitan Transportation Commission, Bay Area Air Quality Management District, and Association of Bay Area Governments. 2006. *Bay Area 2005 Ozone Strategy.* January 4.

Napa County. 2005. Napa County Baseline Data Report, Version 1. November. (J&S 03559.03)Oakland, CA.

Napa Valley Transportation Authority (NVTA). 2005. Napa County Sales Tax Ordinance and Transportation Improvement Expenditure Plan, Draft Program EIR, Section 3.6, Air Quality. November, 20, 2005.

SB 656, Sher. 2003. Codified as Health and Safety Code (H&Sc) section 39614.

U.S. Environmental Protection Agency (EPA). 2006. *The U.S. Inventory of Greenhouse Gas Emissions and Sinks: 1990-2004, April, 2006.*

U.S. Environmental Protection Agency. 1995. *AP 32, Fifth Edition Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, 9.12.2.3. October 1995.*

U.S. Environmental Protection Agency. 2007. *EPA's Personal Greenhouse Gas Calculator. Available Online At: http://yosemite.epa.gov/oar/globalwarming.nsf/content/ResourceCenterToolsGHGCalculator.htm.*