C. Air Quality

This section discusses the potential impacts of the implementation of the Kaiser Permanente OMC Project on the local and regional air quality. As necessary, appropriate standard conditions of approval are also identified and discussed.

Setting

Regulatory Framework

EPA is responsible for implementing the programs established under the federal Clean Air Act, such as establishing and reviewing the federal ambient air quality standards and judging the adequacy of State Implementation Plans (SIP). However, the EPA has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented. In California, the California Air Resources Board (CARB) is responsible for establishing and reviewing the state ambient air quality standards, developing and managing the California SIP, securing approval of this plan from U.S. EPA, and identifying TACs. (A notable exception exists for radioactive air contaminants as the EPA has retained its authority to enforce NESHAP requirements.) CARB also regulates mobile emissions sources in California, such as construction equipment, trucks, and automobiles, and oversees the activities of air quality management districts, which are organized at the county or regional level. An air quality management district is primarily responsible for regulating stationary emissions sources at facilities within its geographic areas and for preparing the air quality plans that are required under the federal Clean Air Act and California Clean Air Act. The Bay Area Air Quality Management District (BAAQMD) is the regional agency with regulatory authority over emission sources in the Bay Area, which includes all of San Francisco, San Mateo, Santa Clara, Alameda, Contra Costa, Marin, and Napa counties and the southern half of Sonoma and southwestern half of Solano counties.

Criteria Air Pollutants

As required by the federal Clean Air Act passed in 1970, the U.S. Environmental Protection Agency (EPA) has identified six criteria air pollutants that are pervasive in urban environments and for which state and national health-based ambient air quality standards have been established. EPA calls these pollutants criteria air pollutants because the agency has regulated them by developing specific public health- and welfare-based criteria as the basis for setting permissible levels. Ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead are the six criteria air pollutants.

Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NOx). ROG and NOx are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NOx under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone. Ground level ozone in conjunction with suspended particulate matter in the atmosphere leads to hazy conditions generally termed as “smog”.

Carbon Monoxide

Carbon monoxide, a colorless and odorless gas is a non-reactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicles. High carbon monoxide concentrations develop primarily during winter when periods of light wind combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased carbon monoxide emission rates at low air temperatures. When inhaled at high concentrations, carbon monoxide combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease or anemia.

Nitrogen Dioxide

Nitrogen dioxide is an air quality concern because it acts a respiratory irritant and is a precursor of ozone. Nitrogen dioxide is produced by fuel combustion in motor vehicles, industrial stationary sources (such as industrial activities), ships, aircraft, and rail transit.

Sulfur Dioxide

Sulfur dioxide is a combustion product of sulfur or sulfur-containing fuels such as coal and oil, which are restricted in the Bay Area. Its health effects include breathing problems and may cause permanent damage to lungs. SO_2 is an ingredient in acid rain (acid aerosols), which can damage trees, lakes and property. Acid aerosols can also reduce visibility.

Particulate Matter

PM-10 and PM-2.5 consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. A micron is one-millionth of a meter, or less than one-25,000th of an inch. For comparison, human hair is 50 microns or larger in diameter. PM-10 and PM-2.5 represent particulate matter of sizes that can be inhaled into the air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of aerosol-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles (PM-2.5) of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility.

PM-10 emissions in the project area are mainly from urban sources, dust suspended by vehicle traffic and secondary aerosols formed by reactions in the atmosphere. Particulate concentrations near residential sources generally are higher during the winter, when more fireplaces are in use and meteorological conditions prevent the dispersion of directly emitted contaminants.

Lead

Leaded gasoline (currently phased out), paint (houses, cars), smelters (metal refineries), manufacture of lead storage batteries have been the primary sources of lead released into the atmosphere. Lead has a range of adverse neurotoxic health effects; children are at special risk. Some lead-containing chemicals cause cancer in animals.

Some criteria air pollutants are considered regional in nature, some are considered local, and some have characteristics that are both regional and local. Air pollutants are also characterized as "primary" and "secondary" pollutants. Primary pollutants are those emitted directly into the atmosphere (such as carbon monoxide, sulfur dioxide, lead particulates, and hydrogen sulfide). Secondary pollutants are those formed through chemical reactions in the atmosphere; these chemical reactions usually involve primary pollutants, normal constituents of the atmosphere, and other secondary pollutants. O_3 is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) compounds and nitrogen oxides (NO_x). ROG and NO_x are known as precursor compounds for O_3. O_3 is a regional air pollutant because its precursors are transported and diffused by wind concurrently with O_3 production.

Ambient CO concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influence CO concentrations. Under inversion conditions, CO concentrations may be distributed more uniformly over an area out to some distance from vehicular sources.

Ambient Air Quality Standards

Regulation of criteria air pollutants is achieved through both national and state ambient air quality standards and emissions limits for individual sources. Regulations implementing the federal Clean Air Act and its subsequent amendments established national ambient air quality standards (national standards) for the six criteria pollutants. California has adopted more stringent state ambient air quality standards for most of the criteria air pollutants. In addition, California has established state ambient air quality standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Because of the unique meteorological problems in the state, there is considerable diversity between state and federal standards currently in effect in California, as shown in **Table IV.C-1**. The table also summarizes the related health effects and principal sources for each pollutant.

TABLE IV.C-1
AMBIENT AIR QUALITY STANDARDS AND BAY AREA ATTAINMENT STATUS

Pollutant	Averaging Time	State Standard	Bay Area Attainment Status for California Standard	Federal Primary Standard	Bay Area Attainment Status for Federal Standard	Major Pollutant Sources
Ozone	8 hour	0.07 ppm	---	0.08 ppm	Nonattainment	Motor vehicles,
	1 hour	0.09 ppm	Non-Attainment	---	---	Other mobile sources, combustion, industrial and commercial processes
Carbon Monoxide	8 hour	9.0 ppm	Attainment	9 ppm	Attainment	Internal combustion engines, primarily gasoline-powered motor vehicles
	1 Hour	20 ppm	Attainment	35 ppm	Attainment	
Nitrogen Dioxide	Annual Average	---	---	0.053 ppm	Attainment	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads
	1 Hour	0.25 ppm	Attainment	---	---	
Sulfur Dioxide	Annual Average	---	---	0.03 ppm	Attainment	Fuel combustion, chemical plants, sulfur recovery plants and metal processing
	24 Hour	0.04 ppm	Attainment	0.14 ppm	Attainment	
	1 Hour	0.25 ppm	Attainment	---	---	
Particulate Matter (PM-10)	Annual Arithmetic Mean	20 μg/m3	Non-Attainment	50 μg/m3	Attainment	Dust- and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays)
	24 hour	50 μg/m3	Non-Attainment	150 μg/m3	Unclassified	
Particulate Matter (PM2.5)	Annual Arithmetic Mean	12 μg/m3	Non-Attainment	15 μg/m3	Attainment	Same as above
	24 hour	---	---	65 μg/m3	Attainment	
Lead	Calendar Quarter	---	---	1.5 μg/m3	Attainment	Lead smelters, battery manufacturing & recycling facilities
	30 Day Average	1.5 μg/m3	Attainment	---	---	

Note: ppm=parts per million; and μg/m3=micrograms per cubic meter

SOURCE: Bay Area Air Quality Management District, 2005, available at http://www.baaqmd.gov/pln/air_quality/ambient_air_quality.htm

The ambient air quality standards are intended to protect the public health and welfare, and they incorporate an adequate margin of safety. They are designed to protect those segments of the public most susceptible to respiratory distress, known as sensitive receptors, including asthmatics, the very young, the elderly, people weak from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels somewhat above the ambient air quality standards before adverse health effects are observed.

Attainment Status

Under amendments to the federal Clean Air Act, U.S. EPA has classified air basins or portions thereof, as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the national standards have been achieved. The California Clean Air Act, which is patterned after the federal Clean Air Act, also requires areas to be designated as "attainment" or "nonattainment" for the state standards. Thus, areas in California have two sets of attainment / nonattainment designations: one set with respect to the national standards and one set with respect to the state standards.

The Bay Area is currently designated "nonattainment" for state 1-hour and national 8-hour ozone standards and for the state PM-10 and PM-2.5 standards. The Bay Area is "attainment" or "unclassified" with respect to the other ambient air quality standards. **Table IV.C-1** also shows the attainment status of the Bay Area with respect to the national and state ambient air quality standards for different criteria pollutants.

Air Quality Plans

The 1977 Clean Air Act Amendments require that regional planning and air pollution control agencies prepare a regional Air Quality Plan to outline the measures by which both stationary and mobile sources of pollutants can be controlled in order to achieve all standards specified in the Clean Air Act. The 1988 California Clean Air Act also requires development of air quality plans and strategies to meet state air quality standards in areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM standards). Maintenance plans are required for attainment areas that had previously been designated nonattainment in order to ensure continued attainment of the standards. Air quality plans developed to meet federal requirements are referred to as State Implementation Plans.

Bay Area plans are prepared with the cooperation of the Metropolitan Transportation Commission (MTC), and the Association of Bay Area Governments (ABAG). Currently, there are three plans for the Bay Area, These are:

- The *Ozone Attainment Plan for the 1-Hour National Ozone Standard* (ABAG, 2001) developed to meet federal ozone air quality planning requirements

- The recently adopted *Bay Area 2005 Ozone Strategy* (BAAQMD, 2006) developed to meet planning requirements related to the state ozone standard; and

- The *1996 Carbon Monoxide Redesignation Request and Maintenance Plan for Ten Federal Planning Areas*, developed by the air districts with jurisdiction over the ten planning areas including the BAAQMD to ensure continued attainment of the federal carbon monoxide standard. In June 1998, the EPA approved this plan and designated the ten areas as attainment. The maintenance plan was revised most recently in 2004.

The Bay Area 2001 Ozone Attainment Plan was prepared as a proposed revision to the Bay Area part of California's plan to achieve the national ozone standard. The plan was prepared in response to US EPA's partial approval and partial disapproval of the Bay Area's 1999 Ozone Attainment Plan and finding of failure to attain the national ambient air quality standard for ozone. The Revised Plan was adopted by the Boards of the co-lead agencies at a public meeting and approved by the ARB in 2001. In July 2003, EPA signed a rulemaking proposing to approve the Plan. EPA also made an interim final determination that the Plan corrects deficiencies identified in the 1999 Plan.

Following three years of low ozone levels (2001, 2002, and 2003), in October 2003, EPA proposed a finding that the Bay Area had attained the national one-hour standard and that certain elements of the 2001 Plan (attainment demonstration, contingency measures and reasonable further progress) were no longer required. In April 2004, EPA made final the finding that the Bay Area had attained the one-hour standard and approved the remaining applicable elements of the 2001 Plan: emission inventory; control measure commitments; motor vehicle emission budgets; reasonably available control measures; and commitments to further study measures.

EPA recently transitioned from the national one-hour standard to a more health protective 8-hour standard. In April 2004, EPA designated regions for the new national 8-hour standard. Defined as "concentration-based," the new national ozone standard is set at 85 parts per billion averaged over eight hours. The new national 8-hour standard is considered to be more health protective because it protects against health effects that occur with longer exposure to lower ozone concentrations.

In April 2004, EPA designated regions as attainment and nonattainment areas for the 8-hour standard. These designations took effect on June 15, 2004. EPA formally designated the Bay Area as a nonattainment area for the national 8-hour ozone standard, and classified the region as "marginal" according to five classes of nonattainment areas for ozone, which range from marginal to extreme. Marginal nonattainment areas must attain the national 8-hour ozone standard by June 15, 2007. While certain elements of Phase 1 of the 8-hour implementation rule are still undergoing legal challenge, EPA signed Phase 2 of the 8-hour implementation rule on November 9, 2005. It is not currently anticipated that marginal areas will be required to prepare attainment demonstrations for the 8-hour standard. Other planning elements may be required. The Bay Area plans to address all requirements of the national 8-hour standard in subsequent documents.

For state air quality planning purposes, the Bay Area is classified as a serious non-attainment area for ozone. The serious classification triggers various plan submittal requirements and transportation performance standards. One such requirement is that the Bay Area update the Clean Air Plan (CAP) every three years to reflect progress in meeting the air quality standards and to incorporate new information regarding the feasibility of control measures and new emission inventory data. The Bay Area's record of progress in implementing previous measures must also be reviewed. On January 4, 2006, the BAAQMD adopted the most recent revision to the CAP - the Bay Area 2005 Ozone Strategy. The control strategy for the *2005 Ozone Strategy* is to implement all feasible measures on an expeditious schedule in order to reduce emissions of ozone precursors and consequently reduce ozone levels in the Bay Area and reduce transport to downwind regions.

In April 2005, ARB established a new eight-hour average ozone standard of 0.070 ppm. The new standard is expected to take effect in 2006. ARB is currently working on designations and implementation guidance for the new standard. The one-hour state standard has been retained. The San Francisco Bay Area has not attained the State eight-hour standards, and will be taking action as necessary to address those standards as appropriate once the planning requirements have been established.

Toxic Air Contaminants

The Health and Safety Code defines toxic air contaminants (TACs) as air pollutants which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health. TACs are less pervasive in the urban atmosphere than criteria air pollutants, but are linked to short-term (acute) or long-term (chronic and/or carcinogenic) adverse human health effects. There are hundreds of different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust. The current list of toxic air contaminants includes approximately 200 compounds, including all of the toxics identified under federal law plus additional compounds, such as particulate emissions from diesel-fueled engines, which was added in 1998. According to the Bay Area Air Quality Management District (BAAQMD), the local agency with governing air quality issues in the Bay Area, diesel exhaust emissions are the TAC responsible for most excess cancer deaths in the Bay Area.

Unlike regulations concerning criteria air pollutants, there are no ambient air quality standards for evaluation of TACs based on the amount of emissions. Instead, TAC emissions are evaluated based on the degree of health risk that could result from exposure to these pollutants. Regulation of toxic air contaminants is achieved through federal and state controls on individual sources.[1]

TACs have been regulated under federal air quality law since the 1977 federal Clean Air Act Amendments. The most recent federal Clean Air Act Amendments (1990) reflect a technology-based approach for reducing TACs. The first phase involves requiring facilities to install Maximum Achievable Control Technology (MACT). The MACT standards vary depending on the type of emitting source. U.S. EPA has established MACT standards for over 20 facilities or activities, such as perchloroethylene dry cleaning and petroleum refineries. The second phase of control involves determining the residual health risk represented by air toxics emissions sources after implementation of MACT standards.

1 Federal environmental laws refer to "hazardous air pollutants," while California environmental laws refer to "toxic air contaminants." Both of these terms basically encompass the same constituent toxic compounds.

Two principal laws provide the foundation for state regulation of TACs from stationary sources. In 1983, the State Legislature adopted Assembly Bill 1807, which established a process for identifying TACs and provided the authority for developing retrofit air toxics control measures on a statewide basis. Air toxics from stationary sources in California are also regulated under Assembly Bill 2588, the Air Toxics "Hot Spots" Information and Assessment Act of 1987. Under Assembly Bill 2588, TAC emissions from individual facilities are quantified and prioritized by the regional air quality management district or county air pollution control district. High priority facilities are required to perform a health risk assessment, and if specific thresholds are violated, they are required to communicate the results to the public in the form of notices and public meetings. Depending on the risk level, emitting facilities can be required to implement varying levels of risk reduction measures.

Locally, the BAAQMD administers the Bay Area's Toxic Air Contaminant Control Program, which is intended to reduce public exposure to TACs from stationary sources in the Bay Area. BAAQMD is currently working to control TAC impacts at local "hot spots" and to reduce TAC background concentrations. The control strategy involves reviewing new stationary sources to ensure compliance with required emissions controls and limits, maintaining an inventory of existing stationary sources of TACs, and developing new rules and regulations to reduce TAC emissions.

Regulation of TACs from mobile sources has traditionally been implemented through emissions standards for on-road motor vehicles (imposed on vehicle manufacturers) and through specifications for gasoline and diesel fuel sold in California (imposed on fuel refineries and retailers), rather than through land use decisions, air quality permits, or regulations addressing how motor vehicles are used by the general public.

Local Standards

BAAQMD Rules and Regulations

The BAAQMD is the regional agency responsible for rulemaking, permitting and enforcement activities affecting stationary sources in the Bay Area. Specific rules and regulations adopted by the BAAQMD limit the emissions that can be generated by various uses and/or activities, and identify specific pollution reduction measures that must be implemented in association with various uses and activities. These rules regulate not only emissions of the six criteria air pollutants, but also toxic emissions and acutely hazardous non-radioactive materials emissions.

Emissions sources subject to these rules are regulated through the BAAQMD's permitting process and standards of operation. Through this permitting process, including an annual permit review, the BAAQMD monitors generation of stationary emissions and uses this information in developing its air quality plans. Any sources of stationary emissions constructed as part of the proposed project would be subject to the BAAQMD *Rules and Regulations*. Both federal and state ozone plans rely heavily upon stationary source control measures set forth in BAAQMD's *Rules and Regulations*

New Source Review

The BAAQMD's New Source Review regulations predominantly apply to non-attainment pollutants. The purpose of the New Source Review rule is to provide for the review of new and modified sources and provide mechanisms, including the use of best available control technology for both criteria and toxic air pollutants, and emissions offsets by which authorities to construct such sources could be granted. The New Source Review regulations also include Prevention of Significant Deterioration (PSD) rules for attainment pollutants. PSD rules are designed to ensure that the emission sources will not cause or interfere with the attainment or maintenance of ambient air quality standards.

Best available control technologies are required for sources that require an authority to construct or a permit to operate if emissions from a new source or increase in emissions from a modified source would be 10 pounds or more per day of any of a number of organic compounds, nitrogen oxides, sulfur dioxide, particulate matter or carbon monoxide, or possibly lesser amounts of toxic air contaminants. The BAAQMD New Source Review regulation requires the purchase of emission "offsets" (effectively precluding other emissions from occurring) for any new or modified source that produces a cumulative increase in emissions above a certain level of nitrogen oxides, precursor organic compounds.

With respect to the construction phase of the project, applicable BAAQMD regulations would relate to portable equipment (e.g., Portland concrete batch plants, and gasoline- or diesel-powered engines used for power generation, pumps, compressors, pile drivers, and cranes), architectural coatings, and paving materials. Equipment used during project construction would be subject to the requirements of BAAQMD Regulation 2 (Permits), Rule 1(General Requirements) with respect to portable equipment unless exempt under Rule 2-1-105 (Exemption, Registered Statewide Portable Equipment); BAAQMD Regulation 8 (Organic Compounds), Rule 3 (Architectural Coatings); and BAAQMD Regulation 8 (Organic Compounds), Rule 15 (Emulsified and Liquid Asphalts). With respect to the operational phase of the project, BAAQMD Regulation 2, *Permits* would apply to sources in the central utility plant proposed as part of the project.

Physical Setting

Climate and Meteorology

Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. The project site is located in the city of Oakland and is within the boundaries of the San Francisco Bay Area Air Basin (Bay Area). The Bay Area Air Basin encompasses the nine-county region including all of Alameda, Contra Costa, Santa Clara, San Francisco, San Mateo, Marin and Napa counties, and the southern portions of Solano and Sonoma counties. The climate of the Bay Area is determined largely by a high-pressure system that is almost always present over the eastern Pacific Ocean off the West Coast of North America. During winter, the Pacific high-pressure system shifts southward, allowing storms to pass through the region. During summer and fall, emissions generated within the Bay Area can combine with abundant sunshine under the restraining influences of topography and subsidence inversions to create conditions that are conducive to the formation of photochemical pollutants, such as ozone and secondary particulates, such as nitrates and sulfates.

More specifically, the project site lies within the Northern Alameda and Western Contra Costa Counties climatological subregion. This subregion stretches from Richmond to San Leandro with the San Francisco Bay as its western boundary and its eastern boundary defined by the Oakland-Berkeley Hills. In this area, marine air traveling through the Golden Gate, as well as across San Francisco and San Bruno Gap is a dominant weather factor. The Oakland-Berkeley Hills cause the westerly flow of air to split off to the north and south of Oakland, which causes diminished wind speeds. However, the air pollution potential in this subregion is relatively low for portions close to the bay, due to the largely good ventilation and less influx of pollutants from upwind sources (BAAQMD, 1999). Yet, during summer and fall, emissions generated within, and those transported to, the East Bay can combine with abundant sunshine under the restraining influences of topography and temperature inversions to create conditions that are conducive to the formation of photochemical pollutants, like ozone.

Wind measurements taken at Metropolitan Oakland International Airport indicate that the predominant wind flow is out of the west-northwest (California Air Resources Board, 1984). Northwest winds occur approximately 46 percent of the time. Average wind speeds vary from season to season with the strongest average winds occurring during summer and the lightest average winds during winter. Average wind speeds are 9.7 miles per hour (mph) during summer and 7.4 mph during winter. Temperature in Oakland Temperature in Oakland averages 58 ^{o}F annually, ranging from an average of 40^{o}F on winter mornings to mid-70s in the late summer afternoons. Daily and seasonal oscillations of temperature are small because of the moderating effects of the nearby ocean. In contrast to the steady temperature regime, rainfall is highly variable and confined almost exclusively to the “rainy” period from early November to mid-April. Oakland averages 18 inches of precipitation annually, but because much of the area’s rainfall is derived from the fringes of mid-latitude storms, a shift in the annual storm track of a few hundred miles can mean the difference between a very wet year and near drought conditions.

Existing Air Quality

Criteria Air Pollutants

The BAAQMD operates a regional monitoring network that measures the ambient concentrations of the six criteria air pollutants. Existing and probable future levels of air quality in Oakland can generally be inferred from ambient air quality measurements conducted by the BAAQMD at its nearby monitoring stations. The Alice Street station in Oakland is nearest to the project site (located approximately 2. miles to the south) and can be considered to be representative of the air quality in the vicinity of the project site. This station monitors ozone and carbon monoxide. **Table IV.C-2** shows a five-year summary of monitoring data for ozone and carbon monoxide from the Alice Street station. The table also compares these measured concentrations with state and federal ambient air quality standards. There is no BAAQMD or CARB station that monitors PM concentrations that can be considered to be representative of concentrations in the project area. The Port of Oakland conducted an air quality and meteorological monitoring program in West Oakland from 1997 to 2004. The program was designed to collect baseline data on particulate air pollution in the West Oakland region prior to and during construction and operation of the Port maritime development projects, and to help evaluate the effectiveness of the mitigation projects. The program measured PM-10 and PM2.5 concentrations at two locations - one location in the vicinity of Port facilities and construction activities and another location in the West Oakland residential neighborhood east (downwind) of Port facilities. **Table IV.C-2** also shows PM-10 and PM-2.5 data from these locations and compares them to the state and national standards. **Table IV.C-3** shows trends in regional exceedances of the federal and state ozone standards. Because of the number of exceedances, ozone is the pollutant of greatest concern in the Bay Area. Bay Area counties experience most ozone exceedances during the period from April through October.

In contrast to some areas of the Bay Area Air Basin, air quality in Oakland generally meets clean air standards on most days. While the meteorology is generally favorable for maintaining good air quality, the Oakland area, along with other portions of the Bay Area that make up the central urban area (i.e., Berkeley-Oakland-San Francisco), is often considered a source region for some pollutants that contribute to elevated concentration levels in downwind communities, such as the Livermore Valley. This is especially the case with mobile or transportation sources.

Motor vehicle transportation, including automobiles, trucks, transit buses, and other modes of transportation, is the major contributor to regional air pollution. Stationary sources were once important contributors to both regional and local pollution. Their role has been substantially reduced in recent years by pollution control programs, such as those of the BAAQMD. Any further progress in air quality improvement now focuses heavily on transportation sources.

Based on the data shown in **Table IV.C -2**, there have been no exceedances of the state and the federal one-hour ozone standards in the project vicinity over the last five years. The principal sources of ozone precursors ROG and NOx in the Bay Area include on-road motor vehicles (approximately 39 percent for ROG and 53 percent for NOx), other mobile sources (approximately 17 percent for ROG and 31 percent for NOx), solvent evaporation (approximately 18 percent for ROG), fuel combustion (approximately 11 percent NOx) and oil and gas production (approximately 8 percent for ROG). Bay Area emissions of the ozone precursors ROG and NOx are expected to decrease by approximately 30 and 44 percent, respectively, between 2004 and 2020 (California Air Resources Board, 2005a) largely as a result of the State's onroad motor vehicle emission control program. The Bay Area has a significant motor vehicle population and these reductions are projected as vehicles meeting more stringent emission standards enter the fleet, and all vehicles use cleaner burning gasoline and diesel fuel or alternative fuels. This includes the use of improved evaporative emission control systems, computerized fuel injection, engine management systems to meet increasingly stringent California emission standards, cleaner gasoline, and the Smog Check program. ROG and NOx emissions from other mobile sources and stationary sources are also projected to decline as more stringent emission standards and control technologies are adopted and implemented.

TABLE IV.C-2
AIR QUALITY DATA SUMMARY (2000-2004) FOR THE PROJECT AREA

Pollutant	Standard[b]	Monitoring Data by Year				
		2000	2001	2002	2003	2004
Ozone[a]:						
Highest 1 Hour Average (ppm)[c] Highest 1-hour average, ppm[c]		0.07	0.07	0.05	0.08	0.08
Days over State Standard Exceedances[d]	0.09	0	0	0	0	0
Days over National Standard	0.12	0	0	0	0	0
Highest 8 Hour Average (ppm)[c] Highest 8-hour average, ppm[c]		0.05	0.04	0.04	0.05	0.06
Days over National Standard Exceedances	0.08	0	0	0	0	0
Carbon Monoxide[a]:						
Highest 1 Hour Average (ppm)[c] Highest 8-hour average, ppm[c]		5.4	5.0	4.4	3.9	NA
Days over State Standard Exceedances	20	0	0	0	0	0
Days over National Standard	35	0	0	0	0	0
Highest 8 Hour Average (ppm)[c] Highest 8-hour average, ppm[c]		3.4	4.0	3.3	2.8	1.9
Days over State/National Standard Exceedances	9.0	0	0	0	0	0
Particulate Matter (PM-10)[e]:		72.0	83.0	110.5	49.9	48.0
Highest 24 Hour Average (μg/m3)[c] Highest 1-hour average, ppm[c]		23	62	61	61	61
Number of sampled days[d]	50	5	10	5	0	0
Sampled days over State Standard[d] Exceedancesd	150	0	0	0	0	0
Sampled days over National Standard[d]						
Particulate Matter (PM-2.5)[e]:	65	60.3	44.9	45.4	29.9	31.0
Highest 24-Hour Average – National (ppm)[c] Highest 8-hour average, ppm[c]		0	0	0	0	0
Sampled days over National Standard[d] Exceedances						

[a] Data are from BAAQMD's Alice Street station in Oakland.
[b] Generally, state standards are not to be exceeded and federal standards are not to be exceeded more than once per year.
[c] ppm = parts per million; g/m3 = micrograms per cubic meter.
[d] PM-10 and PM-2.5 are not measured every day of the year. "Number of samples" refers to the number of days in a given year during which PM-10 and PM-2.5 were measured at the Port of Oakland monitoring stations.
[e] Combined data from the Port and residential monitoring stations are presented.

NA = Not Available.

SOURCE: California Air Resources Board, Summaries of Air Quality Data, 2000, 2001, 2002, 2003, 2004; http://www.arb.ca.gov/adam.

TABLE IV.C-3
SUMMARY OF OZONE DATA FOR THE
SAN FRANCISCO BAY AREA AIR BASIN, 1995–2004

Year	Number of Days Standard Exceeded[a]			Ozone Concentrations in ppm[b]	
	State 1 hr	Federal 1 hr	Federal 8 hr	Maximum 1 hr	Maximum 8 hr
2004	7	0	0	0.11	0.084
2003	19	1	7	0.13	0.101
2002	16	2	7	0.16	0.106
2001	15	1	7	0.13	0.100
2000	12	3	9	0.15	0.144
1999	20	3	4	0.16	0.122
1998	29	8	16	0.15	0.111
1997	8	0	0	0.11	0.084
1996	34	8	14	0.14	0.112
1995	28	11	18	0.16	0.115

[a] This table summarizes the data from all of the monitoring stations within the Bay Area.
[b] ppm = parts per million.

SOURCE: California Air Resources Board web site at http://www.arb.ca.gov/adam/cgi-bin/db2www/polltrendsb.d2w/Branch, 2005.

Table IV.C-2 shows that there have been no exceedances of state and federal ambient carbon monoxide standards at the Alice Street station in Oakland in the last five years. Based on BAAQMD carbon monoxide isopleth maps, 2004 background carbon monoxide concentrations in the project vicinity are approximately 5 parts per million, one-hour average, and 3 parts per million, eight-hour average (BAAQMD, 1999). Currently, on-road motor vehicles are responsible for approximately 70 percent of the carbon monoxide emitted within the San Francisco Bay Area and in Alameda County (California Air Resources Board, 2005a). Carbon monoxide emissions are expected to decrease within the county by approximately 48 percent between 2004 and 2020 due to attrition of older, high polluting vehicles, improvements in the overall automobile fleet, and improved fuel mixtures (California Air Resources Board, 2005a).

Based on data shown in **Table IV.C-2**, state PM-10 standards have been exceeded at the Port of Oakland monitoring stations on a frequent basis during the years 2000 – 2002, after which there have been no exceedances of the standard. The PM-2.5 and the national PM-10 standard have not been exceeded over the last five years. Generally, contributors to PM concentrations in the project area are primarily urban sources, dust suspended by vehicle traffic, and secondary aerosols formed by reactions in the atmosphere. Particulate concentrations near residential sources generally are higher during the winter, when more fireplaces are in use and meteorological conditions prevent the dispersion of directly emitted contaminants. Direct PM-10 emissions in Alameda County are expected to increase by approximately 6 percent between 2004 and 2020 (California Air Resources Board, 2005a). This increase would be primarily from increase in fugitive dust from an anticipated increase in the vehicle miles traveled as well as stationary sources (such as industrial activities) and area sources (such as construction and demolition, road dust and other miscellaneous processes). Fugitive dust refers to particulate matter not emitted from a duct, tailpipe or stack, which becomes airborne due to the forces of wind, man's activity, or both. Activities that generate fugitive dust include vehicle travel over paved and unpaved roads, brake wear, tire wear, soil cultivation, off-road vehicles, or any vehicles operating on open fields or dirt roadways, wind erosion of exposed surfaces, storage piles at construction sites, etc. PM-2.5 emissions in Alameda County are projected to remain steady over the same period (California Air Resources Board, 2005a) as the reduction in emissions from on-road and off-road engines would be offset by an increase in their activity and also an increase in industrial growth.

The standards for nitrogen dioxide, sulfur dioxide, and lead are being met in the Bay Area, and the latest pollutant trends suggest that these standards will not be exceeded in the foreseeable future (ABAG, 2001).

Toxic Air Contaminants

Both BAAQMD and CARB have monitoring networks in the Bay Area that measure ambient concentrations of certain toxic air contaminants that are associated with strong health-related effects and are present in appreciable concentrations in the Bay Area. The BAAQMD uses this information to determine risks for a particular area. Generally, ambient concentrations of toxic air contaminants are similar through the urbanized areas of the Bay Area. Of the pollutants for which monitoring data are available, benzene and 1,3- butadiene (which are emitted primarily from motor vehicles) account for over one half of the average calculated cancer risk (BAAQMD, 2004). Benzene levels have declined dramatically since 1996 with the advent of Phase 2 reformulated gasoline. The use of reformulated gasoline also appears to have led to significant decreases in 1,3-butadiene. Due largely to these observed reductions in ambient benzene and 1,3-butadiene levels, the calculated network average cancer risk has been significantly reduced in recent years. Based on 2002 ambient monitoring data, the BAAQMD reported a calculated lifetime cancer risk from measured concentrations of TACs, excluding diesel particulate matter, to be 162 in one million averaged over all Bay Area locations (BAAQMD, 2004). This is 46 percent less than what was observed in 1995 (BAAQMD, 2004). Because diesel particulate matter can not be directly monitored in the ambient air, the BAAQMD uses California Air Resources Board's estimates of the population-weighted average ambient diesel particulate concentration for the Bay Area to derive an average cancer risk from diesel particulate matter exposure at about 480 in-one-million, as of 2000 (California Air Resources Board, 2005b). The risk from diesel particulate matter has reduced from 750 in-one-million in 1990 and 570 in-one-million in 1995 (California Air Resources Board, 2005b).

The TAC monitoring stations closest to the project site is the Oakland – Davie station (Davie Tennis Stadium, 198 Oak Street), approximately 2.2 miles south of the project site. **Table IV.C-4** provides a summary of TAC Data for the San Francisco Bay Area Air Basin.

TABLE IV.C-4
SAN FRANCISCO BAY AREA AIR BASIN TOXIC AIR CONTAMINANTS – ANNUAL AVERAGE CONCENTRATIONS AND HEALTH RISKS

TAC	Annual Avg. Conc.[a] & Health Risk[b]	1999	2000	2001	2002	2003
Acetaldehyde	Annual Avg	0.76	0.68	0.73	0.63	0.74
	Health Risk	4	3	4	3	4
Benzene	Annual Avg	0.6	0.56	0.43	0.45	0.44
	Health Risk	55	52	39	42	41
1,3-Butadiene	Annual Avg	0.17	0.15	0.13	0.14	0.1
	Health Risk	64	56	50	51	37
Carbon Tetrachloride	Annual Avg	--	0.09	0.09	0.09	0.1
	Health Risk	--	25	23	24	25
Chromium (Hexavalent)	Annual Avg	0.1	0.12	--	0.07	0.1
	Health Risk	15	18	--	11	14
para-Dichlorobenzene	Annual Avg	--	0.11	0.14	0.15	0.15
	Health Risk	--	7	9	10	10
Formaldehyde	Annual Avg	2.09	1.77	2.32	2.57	2.22
	Health Risk	15	13	17	19	16
Methylene Chloride	Annual Avg	--	0.53	0.27	0.22	0.22
	Health Risk	--	2	1	1	1
Perchloroethylene	Annual Avg	--	0.08	0.06	0.05	0.04
	Health Risk	--	3	2	2	2
Diesel Particulate Matter[c]	Annual Avg	1.6	1.6	1.6	1.6	1.6
	Health Risk	480	480	480	480	480

[a] Concentrations for Chromium (Hexavalent) are expressed as ng/m^3 and concentrations for diesel particulate matter are expressed as $\mu g/m^3$. Concentrations for all other TACs are expressed as ppb.
[b] Health Risk represents the number of excess cancer cases per million people based on a lifetime (70-year) exposure to the annual average concentration. There may be other significant compounds other than the ones presented here for which monitoring and/or health risk information are not available.
[c] Diesel particulate matter concentration estimates are based on receptor modeling techniques, and estimates are available only for selected years. Most recent data available is for the year 2000 and has been used for all other years presented.

SOURCE: California Air Resources Board, 2005

Sensitive Land Uses

Some persons are considered more sensitive than others to air pollutants. The reasons for heightened sensitivity may include health problems, proximity to the emissions source, and duration of exposure to air pollutants. Land uses such as schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because the very young, the old, and the infirm are more susceptible to respiratory infections and other air-quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people are often at home for extended periods. Recreational land uses are moderately sensitive to air pollution, because vigorous exercise associated with recreation places a high demand on the human respiratory system.

A variety of commercial, retail, civic, and residential uses surround the project site. Sensitive uses along Piedmont Avenue include primarily residential uses and a mortuary located to the east of the project site. East of Piedmont Avenue, along its length, are residential neighborhoods comprised of multifamily and single-family residences. MacArthur Boulevard to the east also primarily contains one-two-unit residences and varied commercial uses including a child care center. The uses to the south of the project site are mainly commercial.

Directly west (and south, generally) of the project site is the 11-acre Mosswood Park, a community park that provides open green space area and recreational facilities at the southwest corner of Broadway and West MacArthur Boulevard. Further west of the project site (north and south of West MacArthur Boulevard) are residential neighborhoods. A number of single-family residences abut the existing medical center along the west.

Uses north of the project site include residential neighborhoods of primarily one- and two-unit residences with low-rise apartment buildings in dense development pattern. A number of single-family residences abut the existing medical center along the north (generally 38th Street). This area also contains a variety of commercial services, medical offices, retail, and service uses.

Impacts and Mitigation Measures

Significance Criteria

For air quality, a project may be deemed to have a significant adverse impact on the environment if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Frequently create substantial objectionable odors affecting a substantial number of people;
- Contribute to CO concentrations exceeding the State AAQS of 9 ppm averaged over 8 hours and 20 ppm for 1 hour (Note: Pursuant to BAAQMD, localized carbon monoxide concentrations should be estimated for projects in which (1) vehicle emissions of CO would exceed 550 lb/day; (2) intersections or roadway links would decline to LOS E or F; (3) intersections operating at LOS E or F will have reduced LOS; or (4) traffic volume increase on nearby roadways by 10% or more unless the increase in traffic volume is less than 100 vehicles per hour);
- Result in total emissions of ROG, NO_x, or PM_{10} of 15 tons per year or greater, or 80 pounds (36 kilograms) per day or greater

- Result in potential to expose persons to substantial levels of Toxic Air Contaminants (TAC), such that the probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeds 10 in one million;
- Result in ground level concentrations of non-carcinogenic TACs such that the Hazard Index would be greater than 1 for the MEI; or
- Result in a substantial increase in diesel emissions.

The following air quality analysis addresses all of these general criteria except the fifth criterion regarding odors. Since any sources of odor proposed as part of the project would be subject to the requirements of BAAQMD Regulation 7 – *Odorous Substances*, any odor impacts would be maintained at a less than significant level. The regulation states that a person shall not discharge any odorous substance, which remains odorous after dilution with odor-free air. The regulation also specifies the dilution rates for different emission point elevations and the method of collection and analysis of samples. The regulation also prohibits a person from discharging any odorous substance, which causes the ambient air at or beyond the property line of such person to be odorous and to remain odorous after dilution with four parts of odor-free air. These requirements of Regulation 7 apply once the Air Pollution Control Officer (APCO) receives odor complaints from ten or more complainants within a 90-day period, alleging that a person has caused odors perceived at or beyond the property line of such person and deemed to be objectionable by the complainants in the normal course of their work, travel or residence. When the limits of this regulation become effective as a result of citizen complaints described above, the limits shall remain effective until such time as no citizen complaints have been received by the APCO for 1 year. The limits of this regulation become applicable again if and when the APCO receives odor complaints from five or more complainants within a 90-day period.

For project-level impact analysis, the BAAQMD provides various thresholds and tests of significance. For ROG, NO_x and PM-10, a net increase of 80 pounds per day is considered significant, while for CO, an increase of 550 pounds per day would be considered significant if it leads to or contributes to CO concentrations exceeding the State Ambient Air Quality Standard of 9 ppm averaged over 8 hours and 20 ppm for 1 hour (i.e., if it creates a “hot spot”). Generally, if a project results in an increase in ROG, NOx, or PM-10 of more than 80 pounds per day, then it would also be considered to contribute considerably to a significant cumulative effect. For projects that would not lead to a significant increase of ROG, NOx, or PM-10 emissions, the cumulative effect is evaluated based on a determination of the consistency of the project with the regional Clean Air Plan. These criteria recommended by the BAAQMD are consistent with the criteria used by the City of Oakland, listed above.

Although the project is consistent with the various Oakland General Plan land use designations that apply to the project site, the proposed project includes an amendment to the General Plan Land Use Map. The proposed amendment would assign the *Institutional* land use classification to all portions of the project site for purposes of clarity on the Land Use map. This change would neither affect population nor vehicle miles traveled (VMT) assumptions in the current General Plan. Therefore, there will be no change in the air quality emissions from the project site as a result of GPA. So the air quality impact analysis of the GPA according to the BAAQMD significance criteria for plans is not required.

Methodology

Project-related air quality impacts fall into two categories: short-term impacts due to construction, and long-term impacts due to project operation. First, during project construction, the project would affect local particulate concentrations primarily due to fugitive dust sources. Over the long term, the project would result in an increase in emissions primarily due to increased motor vehicle trips. On-site stationary sources (CUP, such as natural gas boilers for water and space heating) and area sources (such as landscaping and use of consumer products) would result in lesser quantities of pollutant emissions.

For construction phase impacts, BAAQMD does not require quantification of construction emissions, but recommends that significance be based on a consideration of the control measures to be implemented (BAAQMD, 1999). Construction impacts are discussed qualitatively and the applicable BAAQMD recommended dust abatement measures are identified.

Operational phase emissions were estimated using the URBEMIS 2002 model (version 7.5) for the expected project buildout year 2020 and compared to BAAQMD significance thresholds. Carbon monoxide impacts were evaluated using the BAAQMD's methodology for manual calculation of carbon monoxide concentrations specified in the 1999 BAAQMD CEQA Guidelines. Analysis was conducted for 2005 (existing), 2010 with and without project, and 2025 (cumulative analysis year) with and without project conditions.

Lastly, cumulative impacts of the project were evaluated based on the *BAAQMD CEQA Guidelines* as discussed under the significance thresholds.

Project Construction Impacts

Impact C.1: Activities associated with demolition, site preparation and construction would generate short-term emissions of criteria pollutants, including suspended and inhalable particulate matter and equipment exhaust emissions. (Significant)

Construction related emissions would be short term, but may still cause adverse effects on the local air quality. The project would be constructed in would be developed in three phases over a period of approximately 14 years, from year 2006 to year 2020 (buildout). Project-related construction activities would include site preparation, earthmoving and general construction. Site preparation includes activities such as general land clearing and grubbing. Earthmoving activities include cut and fill operations, trenching, soil compaction and grading. General construction includes adding improvements such as roadway surfaces, structures and facilities. The emissions generated from these construction activities include:

- Dust (including PM-10 and PM-2.5) primarily from "fugitive" sources (i.e., emissions released through means other than through a stack or tailpipe) such as soil disturbance;

- Combustion emissions of criteria air pollutants (ROG, NOx, CO, SOx, PM-10) primarily from operation of heavy equipment construction machinery (primarily diesel operated), portable auxiliary equipment and construction worker automobile trips (primarily gasoline operated);
- Evaporative emissions (ROG) from asphalt paving and architectural coating applications.

Demolition may result in airborne entrainment of asbestos, a toxic air contaminant, particularly where structures built prior to 1980 are being demolished. As stated above, the project would involve demolition of all existing structures on the project site. Some structural components of the buildings to be demolished may contain hazardous materials such as asbestos used in insulation, fire retardants, or building materials (floor tile, roofing, etc.) and lead-based paint. This would result in a significant impact. As required for all development projects involving demolition of existing buildings, the project applicant would be required to implement and comply with the following uniformly-applied standard conditions of approval, which would help reduce the potential for public health hazards associated with airborne asbestos fibers or lead dust to a less than significant level:

> **Standard Condition C.1a: If asbestos were found to be present in building materials to be removed, demolition and disposal would be required to be conducted in accordance with procedures specified by Regulation 11, Rule 2 (Asbestos Demolition, Renovation and Manufacturing) of BAAQMD's regulations.**

Standard Condition C.1a is consistent with Standard Conditions H.1a through H.1e, which address pre-construction assessments and abatement measures to reduce the significant impact of exposing workers, the public, or the environment to asbestos or other hazardous building materials, such as lead-based paint and PCBs, during demolition or construction activities. (See Section IV.H, Public Safety and Hazards.)

Construction activities would also result in the emission of ROG, NO_x, CO, Sox, and PM-10 from equipment exhaust, construction-related vehicular activity and construction worker automobile trips. Emission levels for construction activities would vary depending on the number and type of equipment, duration of use, operation schedules, and the number of construction workers. Criteria pollutant emissions of ROG and NO_x from these emission sources would incrementally add to the regional atmospheric loading of ozone precursors during project construction. BAAQMD CEQA Guidelines recognize that construction equipment emits ozone precursors, but indicate that such emissions are included in the emission inventory that is the basis for regional air quality plans. Therefore, construction emissions of ROG and NOx are not expected to impede attainment or maintenance of ozone standards in the Bay Area (BAAQMD, 1999). The impact of construction equipment exhaust emissions would therefore be less than significant.

Construction-related fugitive dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil, and the weather. In the absence of mitigation, construction activities may result in significant quantities of dust, and as a result, local visibility and PM-10 and PM-2.5 concentrations may be adversely affected on a temporary and intermittent basis during the construction period. In addition, the fugitive dust generated by construction would include not only PM-10, but also larger particles, which would fall out of the atmosphere within several hundred feet of the site and could result in nuisance-type impacts. The BAAQMD's approach to analyses of fugitive dust emissions from construction is to emphasize implementation of effective and comprehensive dust control measures rather than detailed quantification of emissions. The District considers any project's construction related impacts to be less than significant if the required dust-control measures are implemented. Without these measures, the impact is generally considered to be significant, particularly if sensitive land uses are located in the project vicinity. In the case of this project, residential land uses are located as close as 100 feet from the boundaries of the project site. Since the existing hospital will be in operation during construction, patients of the existing hospital would be the most affected receptors. The proposed project would be subject to the measures recommended by the BAAQMD (listed below), which are uniformly applied by the City as standard conditions of approval, and which would reduce the impact of fugitive dust emissions to less than significant.

Standard Condition C.1b: During construction, the project sponsor shall require the construction contractor to implement the following measures required as part of BAAQMD's basic and enhanced dust control procedures required for sites larger than four acres. These include:

- **Water all active construction areas at least twice daily. Watering should be sufficient to prevent airborne dust from leaving the site. Increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water should be used whenever possible.**
- **Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard (i.e., the minimum required space between the top of the load and the top of the trailer).**
- **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.**
- **Sweep daily (with water sweepers using reclaimed water if possible) all paved access roads, parking areas and staging areas at construction sites.**
- **Sweep streets (with water sweepers using reclaimed water if possible) at the end of each day if visible soil material is carried onto adjacent paved roads.**
- **Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for one month or more).**
- **Enclose, cover, water twice daily or apply (non-toxic) soil stabilizers to exposed stockpiles (dirt, sand, etc.).**
- **Limit traffic speeds on unpaved roads to 15 miles per hour.**
- **Limit the amount of the disturbed area at any one time, where feasible.**

- **Pave all roadways, driveways, sidewalks, etc. as soon as feasible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used.**

- **Replant vegetation in disturbed areas as quickly as feasible.**

- **Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.**

- **Designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. Their duties shall include holidays and weekend periods when work may not be in progress. The name and telephone number of such persons shall be provided to the BAAQMD prior to the start of construction as well as posted on-site over the duration of construction.**

Significance after Implementation of Standard Conditions: Less than Significant.

Project Operational Impacts

Impact C.2: The project would result in increased long-term emissions of criteria pollutants from vehicular traffic to and from the project site and from the operation of the Central Utility Plant. The increase in emissions would exceed Bay Area Air Quality Management District significance criteria for daily emissions of PM-10. (Significant)

Exhaust emissions related to passenger vehicle travel from project operations were calculated by using the URBEMIS2002 program of the California Air Resources Board, applying EMFAC2002 emission factors to a standard mix of passenger vehicles in the year 2020, the buildout year for the project. Emissions from the CUP boilers were calculated using AP-42 emission factors assuming the use of low NOx burners to control NOx.

Table IV.C-5 summarizes project-generated mobile and stationary emissions of criteria pollutants for the project in the year 2020 and compares them with significance threshold emission levels. The proposed project would generate approximately 35, 440 daily vehicle trips. This level of vehicle trips assumes that implementation of Kaiser's current Transportation Demand Management (TDM) program components would *continue* in the future and be modified as the Kaiser OMC population grows, in order to maintain the current alternative mode split (carpool, transit, bike, walk, etc.) The existing measures to be continued include provision of a BART shuttle, commuter check program, commuter tax incentive, provision of adequate bicycle and preferential carpool parking, and the availability of concierge services for Kaiser employees. (See Section IV.B, Transportation, Circulation, and Parking for additional discussion.) As shown in **Table IV.C -5**, the net increase in vehicle trips that would occur with the project and result in project-related mobile emissions would not exceed the significance threshold emission level of 80 pounds per day for ROG and NOx, but would exceed the threshold level for PM-10. Therefore, the operational impact of PM-10 emissions from increases in vehicular trips and area sources of the project would be significant.

TABLE IV.C-5
ESTIMATED DAILY EMISSIONS FOR THE PROPOSED PROJECT

Air Pollutant	Project Emissions, 2020 (pounds/day) Area Source Emissions	Vehicular Emissions[a]	Total	Significance Threshold (pounds/day)
NOx	9.1	30.9	40	80
PM-10	0.8	81.8	**82.6**	80
ROG	0.9	27.6	28.5	80
CO	10.1	319.6	329.7	550[b]

[a] Emission factors were generated by the Air Board's URBEMIS2002 model for San Francisco Bay Air Basin, and assume a default vehicle mix. All daily estimates are for summertime conditions except for CO, which assumes wintertime conditions.
[b] Projects for which mobile source CO emissions exceed 550 pounds per day do not necessarily have a significant air quality impact, but are required to estimate localized CO concentrations. Refer to Impact C.3 for analysis of project CO emissions.

NOTE: **Bold** values are in excess of applicable standard.

SOURCE: Environmental Science Associates, 2005

Mitigation Measure C.2: As required by Mitigation Measures B.1a, B.2a, and B.2b to address intersection impacts (Impacts B.1 and B.2), the existing Transportation Demand Management (TDM) program shall be expanded (beyond that already assumed to occur as part of the project) to include additional measures that would encourage more Kaiser employees to switch from driving alone to other modes. The project shall implement the TDM program, to the extent feasible, in an effort to reduce daily vehicle trips associated with the project. The effectiveness of the TDM program shall be regularly monitored, and if necessary adjusted to better satisfy the needs of the medical center.

Possible expanded TDM measures include, but are not limited to, increasing transit ticket subsidies, employee awareness programs, direct transit sales, providing a guaranteed ride home program, and charging more for parking. Although the specific components or implementation methods of the expanded TDM program have not been determined for this analysis, it is possible that the implementation of expanded measures could effectively reduce daily project trip generation by a number that would reduce PM-10 emissions to below the significance threshold emission level of 80 pounds per day. A reduction of at least approximately 350 daily vehicle trips, or at least one percent of the total daily vehicle trips, would effectively reduce PM-10 emissions by at least approximately 2.7 pounds per day, which could reduce the impact of PM-10 emissions to less than significant. However, since the components of the expanded TDM program have not been determined yet, and their effectiveness on reducing project trip generation cannot be quantified, this analysis assumes that there would not be a reduction in PM-10 emissions. Thus, this measure is not sufficient to fully mitigate the impact.

Significance after Mitigation: Significant and Unavoidable

Impact C.3: Mobile emissions generated by project traffic would increase carbon monoxide concentrations at intersections in the project vicinity. (Less than Significant)

In addition to the project's regional contribution to the total pollution burden, project-related traffic may lead to localized "hot spots" or areas with high concentrations of carbon monoxide concentrations around stagnation points such as major intersections and heavily traveled and congested roadways. Project-related traffic could not only increase existing traffic volumes, but also cause existing non-project traffic to travel at slower, more polluting speeds.

To evaluate "hot spot" potential, a microscale impact analysis was conducted adjacent to five intersections in the vicinity of the project site, most impacted by project traffic. The intersections chosen were based on their Level of Service and the percentage contribution of project-traffic. It was assumed that if the relatively higher volumes of project-generated traffic at these intersections did not result in adverse impacts, impacts at other nearby intersections would experience similar or less substantial effects. For this analysis, local carbon monoxide concentrations were estimated by applying the BAAQMD's methodology for manual calculation of CO concentrations along roadways and intersections to the results of the traffic study prepared for this project. Results of the analysis are shown in **Table IV.C-6**.

As shown in the table, the analysis demonstrated that no exceedances would occur in the vicinity of all five analyzed intersections under any of the scenarios. Therefore, the effect of the project on local carbon monoxide standards would be less than significant. Carbon monoxide concentrations in 2010 and 2025 are projected to progressively lower compared to existing conditions due to improvements in the automobile fleet, attrition of older, high-polluting vehicles, and improved fuel mixtures. Such reduction would offset any effects of increase in traffic due to cumulative development. Thus, project-related and cumulative traffic would have a less than significant impact on local carbon monoxide concentrations.

**TABLE IV.C-6
ESTIMATED CARBON MONOXIDE CONCENTRATIONS AT SELECTED INTERSECTIONS IN PROJECT VICINITY**

Scenario	Averaging Time (hours)	Concentrations (ppm)[a,b]				
		Broadway / 51th Street	**Broadway / 38th Street N**	**Broadway / W MacArthur**	**Telegraph / 40th Street**	**Howe St / W MacArthur**
Existing (2005)	1	6.6	6.5	6.4	6.3	6.6
PM Peak Hour	8	4.4	4.4	4.3	4.2	4.4
Existing + Project	1	6.6	6.5	6.4	6.3	6.6
PM Peak Hour	8	4.4	4.4	4.3	4.2	4.4
2010 Baseline	1	6.0	5.9	5.8	5.7	6.0
PM Peak Hour	8	4.0	4.0	3.9	3.8	4.0
2010 + Project	1	6.0	5.9	5.8	5.7	6.0
PM Peak Hour	8	4.0	4.0	3.9	3.8	4.0
2025 Baseline	1	5.8	5.7	5.7	5.6	5.8
PM Peak Hour	8	3.9	3.8	3.8	3.8	3.9
2025 + Project	1	5.8	5.7	5.7	5.6	5.8
PM Peak Hour	8	3.9	3.8	3.8	3.8	3.9

[a] Concentrations relate to a location 25 feet from the edge of the roadways that form the intersection. The carbon monoxide analysis focuses on the weekday afternoon (p.m.) peak-hour because the project's effects on traffic congestion and related carbon monoxide concentrations are greater during that period than during the morning (a.m.) peak hour. Carbon monoxide estimates shown above include background concentrations of 5.7 ppm, one-hour average, and 3.8 ppm, eight-hour average for 2005; 5.2 ppm, one-hour average and 3.5 ppm, eight-hour average for 2010 and 2025. 2010 concentrations have been used for 2025 to provide a conservative estimate as 2025 emission factors were not available.

[b] The California ambient air quality standard for carbon monoxide is 20 ppm, one-hour average and 9 ppm, eight-hour average.

NOTE: Bold values are in excess of applicable standard.

SOURCE: Environmental Science Associates, 2005.

Mitigation: None required.

Impact C.4: The proposed project could result in exposure of persons to substantial levels of Toxic Air Contaminants such that the probability of contracting cancer for the Maximally Exposed Individual exceeds 10 in one million. (Less than Significant)

DPM emissions from the project during operation would occur primarily from the delivery trucks that will be visiting the site. Based on the traffic report conducted for this project, daily traffic increases due to the project would be approximately 9,903 total vehicle trips by 2020. To determine the proportion of new trips that would be truck trips, the general vehicle fleet percentages contained in URBEMIS2002 were used. In 2020 when project operations would commence, there would be approximately 320 total daily truck trips. Likewise, the percentage of trucks within each weight class and the portion of these trucks that are fueled by diesel were also obtained from URBEMIS2002. Lastly, diesel exhaust emissions rates for all diesel trucks were obtained from CARB's EMFAC2002 emissions model, assuming an average vehicle speed of 20 mph. Total emissions were calculated for a total distance of one mile, which includes one-half mile as the truck approaches the site and one-half mile as the truck leaves the site. The annual average DPM emissions for these truck-travel distances were estimated to be 19 lbs in 2020.

Annual average DPM concentration impacts from the delivery trucks operating near the site were calculated using the SCREEN3 model, and the incremental cancer risks were estimated from these concentrations. The estimated incremental DPM concentration at the site was calculated to be 0.005 microgram per cubic meter. The incremental cancer risk from exposure to these concentrations was estimated to be 1.6 in a million. Since these impacts are less than the BAAQMD significance threshold of 10 in a million, the impacts would be less than significant**.**

As the boilers associated with the proposed Central Utility Plant would be natural gas-fired, PM emissions are expected to be very minimal and would not significantly contribute to the cancer risk calculated above.

Mitigation: None required.

Cumulative Impacts

Impact C.5: The proposed project together with anticipated future development in the area, could result in long-term traffic increases and could cumulatively increase regional air pollutant emissions and conflict with or obstruct implementation of the Bay Area Clean Air Plan. (Significant)

Locally, emissions from project sources would be combined with emissions from other sources, primarily including area traffic (local streets and freeways) from existing and future development in the greater project area. Although cumulative traffic volumes would increase by 2025, this increase would be partly offset by the reduction in emissions on a grams-per-mile basis. This is due to attrition of older, high polluting vehicles, improvements in the overall automobile fleet, and improved fuel mixtures (as a result of on-going State and federal emissions standards and programs for on-road motor vehicles). Cumulative impacts on carbon monoxide concentrations at local intersections in 2025 would be less than significant as the worst-case carbon monoxide concentrations at all the analyzed intersections would be below the corresponding ambient standards.

According to the BAAQMD CEQA Guidelines, any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact. **Table IV.C-5** shows that the operational emissions of ROG and NOx due to project-related traffic estimated based on the ARB model URBEMIS 2002 would be less than the significance criteria of 80 pounds per day. However, the operational emissions of PM-10 would be significant. Therefore the cumulative air quality impact of the project would be considered to be significant. Mitigation Measure C.2 would reduce the project's individual impact, although not to a less-than-significant level since expanded TDM components have not been confirmed or quantified.

Per BAAQMD significance criteria for cumulative impacts, population and VMT increase due to the project must be accounted for in the regional CAP in order for the project to have a less than significant cumulative impact. The recently adopted 2005 Bay Area Ozone Strategy prepared by the BAAQMD, MTC and ABAG is based on population projections for Oakland that assume the proposed development of the project. However, while the proposed project is consistent with the 2005 Ozone Strategy, the cumulative impact of the project would remain significant since it would exceed operational emissions of PM-10, even with the implementation of Mitigation Measure C.2.

Significance after Mitigation: Significant and Unavoidable

References – Air Quality

Association of Bay Area Governments, *Projections 98,* 1999.

Association of Bay Area Governments, Bay Area Air Quality Management District, Metropolitan Transportation Commission, *Revised San Francisco Bay Area Ozone Attainment Plan for the 1-Hour National Ozone Standard*, October 2001.

California Air Resources Board, *Final Carbon Monoxide Redesignation Request and Maintenance Plan for Ten Federal Planning Areas*, April 1996.

California Air Resources Board, *2004 Revision to the California State Implementation Plan for Carbon Monoxide – Updated Maintenance Plan for Ten Federal Planning Areas*, July 2004.

Bay Area Air Quality Management District (BAAQMD), *Proposed Final San Francisco Bay Area Redesignation Request and Maintenance Plan for the National Carbon Monoxide Standard*, July 1994.

Bay Area Air Quality Management District, *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plan*, December 1999.

Bay Area Air Quality Management District, *Bay Area 2000 Clean Air*, December 20, 2000.

Bay Area Air Quality management District, *Ambient Air Quality Standards and Bay Area Attainment Status*, updated July 2005.

California Air Resources Board, *Air Quality Data Summaries and Statistics,* 2000 - 2004, available at http://www.arb.ca.gov/adam/welcome.html, accessed November 30, 2005.