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## 3.5 AIR QUALITY

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This section summarizes pertinent air quality baseline information, including descriptions of the climate in the project area; federal, State, and regional air quality standards; and existing air quality conditions in the San Francisco Bay Area for both “criteria air pollutants” (pollutants for which State and federal ambient standards exist) and “toxic air contaminants” (TACs) (pollutants that pose human health risks). Air quality effects caused by stationary and mobile sources related to the proposed Master Plan project and cumulative development are then evaluated. Regional and localized air emissions are compared to the State and federal ambient air quality standards, as well as the standards established by the Bay Area Air Quality Management District (BAAQMD).

### Introduction

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According to the Initial Study (Appendix B), implementation of the mitigation measures from BAAQMD CEQA Guidelines would reduce the impacts of construction emissions of particulate matter to a less-than-significant level. As a result, construction-related air quality impacts are not addressed further in this EIR.

### Setting

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Ambient air quality is influenced by climatological conditions, topography, and the quantity and type of pollutants released in an area. The major determinants of transport and dilution of a given pollutant are wind, atmospheric stability, terrain, and sunshine for photochemical pollutants. Motor vehicle emissions in this section are calculated using air emission modeling based on information from the traffic study prepared for the proposed project.

### Regional Climate and Topography

The climate of the Bay Area is characterized by meteorological conditions associated with the semi-permanent high-pressure area in the eastern Pacific Ocean which leads to mild, rainy winter weather from November through March, and warm, dry weather from June through September. The months of April, May, and October are usually characterized by mild weather conditions. The climate combined with the complex regional topography of the San Francisco Bay Area air basin make it an area of potential smog, a blend of combustion emissions and gaseous emissions such as reactive organic gases (ROG) and (NO<sub>x</sub>), that undergo photochemical reactions in sunlight to form ozone.

Region-wide temperature inversions, caused by warm air positioned above the cool daytime surface air, prohibit vertical mixing of air. Air pollution potential in the region is highest when inversions are strong and winds are light. This condition occurs because pollutants are emitted into an air mass that has a limited capacity to disperse the contaminants. Inversions most commonly occur during calm cool winter weather or still weather in the summer.

The proposed project is located within the Peninsula climatological subregion that extends from northwest of San Jose to the Golden Gate. The Santa Cruz Mountains run up the center of the Peninsula, creating an area of warmer temperatures and fewer foggy days to the east where the ridgeline blocks the marine layer. Redwood City, where the proposed project is located, averages summer high temperatures in the low-80's, and in the winter, average low temperatures are in the 30's to low 40's.<sup>1</sup> Annual average wind speed in this area ranges from 5 to 10 miles per hour. Air pollution along this portion of the Peninsula is the highest in the subregion due to motor vehicle traffic and stationary sources.

## **Air Quality Conditions**

**Regional Air Quality.** With the assistance of the BAAQMD, the California Air Resources Board (CARB) compiles inventories and projections of carbon monoxide (CO), reactive organic gases (ROG), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), and particulate matter (less than 10 microns in size) (PM<sub>10</sub>) emissions for the Bay Area. ROG is included in the inventories because it is a precursor to ozone formation. Table 3.5-1 presents a summary of the emissions inventory and trends of air pollutants for the Bay Area and San Mateo County. Estimates of substantial reductions in CO emissions projected from 2001 to 2010 are primarily based on projections of motor vehicle emissions reducing over time as older vehicles are retired. PM<sub>10</sub> and SO<sub>2</sub> are forecast to increase slightly, due to growth in stationary source and industry activities.

San Mateo County lies within the San Francisco Bay Area Air Basin. The Air Basin has a history of recorded violations of federal and State ambient air quality standards for ozone, CO, and PM<sub>10</sub>. Since the early 1970s, substantial progress has been made toward controlling these pollutants. As a result, the Bay Area is in attainment for all State and federal standards except those for ozone and PM<sub>10</sub>. For ozone, the Bay Area does not meet either the State or federal standard. For PM<sub>10</sub>, the Bay Area does not meet the State standard but does meet the federal standard.

**Local Air Quality.** BAAQMD operates an air quality monitoring station in Redwood City. During the period of 1998 through 2001 for Redwood City, the State 1-hour ozone standard was only exceeded one day total in a year, and the federal 1-hour and 8-hour standards were not exceeded at this station. During the period of 1998 through 2001 at the Redwood City station, the measured State 24-hour PM<sub>10</sub> standard was exceeded in no more than 4 days per year, the federal 24-hour standard was not exceeded at all, and the State and federal annual standards were not exceeded at all.

The regional and local air quality data show that while the region has made considerable progress to meet the State and federal standards, violations of particulate matter and ozone standards still occasionally occur. The violations that typically occur in the San Mateo County area are caused by a combination of locally generated emissions and pollutants transported into the area from upwind sites. In this respect, the air quality conditions in the project area will continue to benefit from local and regionwide efforts to control emissions.

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<sup>1</sup> BAAQMD, *CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans*, April 1996, Appendix D.

**Table 3.5-1**  
**Criteria Pollutant Emissions Inventory and Projections**  
**(Tons/Day - Annual Average)**

	CO	ROG <sup>1</sup>	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub> <sup>2</sup>
<b><u>Bay Area</u></b>					
<b>2001 Estimated</b>					
Total Emissions	2810	536	625	82	187
On-Road Motor Vehicle Emissions	2138	228	337	2	10
<b>2010 Forecasted</b>					
Total Emissions	1727	396	443	84	359
On-Road Motor Vehicle Emissions	1125	123	198	1	10
<b><u>San Mateo County</u></b>					
<b>2001 Estimated</b>					
Total Emissions	298	56	65	2	20
On-Road Motor Vehicle Emissions	230	25	35	.2	1
<b>2010 Forecasted</b>					
Total Emissions	185	41	48	2	38
On-Road Motor Vehicle Emissions	123	13	21	.1	1

*Source:* California Air Resources Board, Emissions by Category. Available at: [www.arb.ca.gov/emisinv/eib.htm](http://www.arb.ca.gov/emisinv/eib.htm).

*Notes:*

1. Reactive organic gases (excluding emissions from natural vegetation).
2. On-Road Motor Vehicle Emissions category in this table includes paved road dust generated by traffic.

At locations throughout the Bay Area, BAAQMD measures ambient levels of approximately 15 of the most commonly occurring TACs. The monitoring station for TACs that is nearest to the project site is on Chapel Way in Fremont. The TACs monitored at this station in the highest concentrations are benzene, toluene, and meta/para-xylenes. Each of these compounds is commonly associated with automobile emissions. These data represent the combined impacts of TACs emitted from various sources, including stationary (e.g., industry) and mobile sources.

**Local Source Inventory.** Emissions from mobile sources are responsible for the overwhelming majority of emissions in the project area. Vehicles traveling the roadways near the site contribute to the local emissions base. The residential uses near the project site also cause minor amounts of emissions through operation of heating and cooling equipment and operation of area-wide sources such as landscaping equipment, water heaters, and fireplaces. These are not considered to be significant operational emission sources, because the quantity of emissions generated by motor vehicles substantially outweighs stationary source emissions.

Currently on site, the Medical Center operates a Central Utilities Plant (CUP) near the existing service building. The CUP houses mechanical equipment including hot water boilers; steam generators; chillers and air handling for heating ventilating and air conditioning (HVAC); compressed air and vacuum pumps; water softeners; and a tank for oxygen and other medical gases. The CUP also

houses electrical equipment including switchgear rooms, and emergency generators. These operations mainly emit heat and steam and are not associated with TAC emissions.

## **Applicable Plans and Regulations**

Federal, State, regional, and local laws and regulations are the basis for controlling air pollution. The major control efforts focus on the six “criteria” air pollutants and the precursor compounds that react to form those pollutants. The six criteria pollutants include ozone, CO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, and lead. The federal Clean Air Act (CAA), as amended, and the California Clean Air Act (CCAA) are the primary drivers for attaining and maintaining the ambient air standards. These laws also provide the basis for the implementing agencies to develop mobile and stationary source control measures. The U.S. Environmental Protection Agency (EPA) is responsible for enforcing the 1990 amendments to the federal CAA and the national ambient air quality standards (federal standards) that it establishes.

The California Air Resources Board (CARB), 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 CCAA, responding to the federal CAA requirements, and for regulating emissions from motor vehicles and consumer products within the state. CARB 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.

Like EPA, CARB has established ambient air quality standards for the state (State standards). 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 also more stringent than the federal standards in the case of PM<sub>10</sub> and SO<sub>2</sub>. The amendments to the CCAA require air pollution control districts to achieve the State standards by the earliest practicable date.

**Ambient Air Quality Standards.** Based on the authority of the Federal CAA, as amended, and the CCAA, federal and State regulatory agencies set upper limits on airborne concentrations of ozone, CO, NO<sub>2</sub>, SO<sub>2</sub>, particulate matter, and lead. Particulate matter is regulated as inhalable particulate matter less than ten microns in diameter (PM<sub>10</sub>) and fine particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>). ROG are regulated as precursors to ozone. Control of these pollutants includes reducing emissions from motor vehicles, industrial processes, and area-wide sources such as use of consumer products.

The federal and State standards for these pollutants are summarized in Table 3.5-2. These “ambient air quality standards” (AAQS) are designed to protect all segments of the population including those most susceptible to the pollutants’ adverse effects (e.g., the very young, the elderly, people weak from illness or disease, or persons doing heavy work or exercise). The potential human health effects of these air pollutants are presented in Table 3.5-3. Pollution potential in the project area is high because of the sheltering effects of the Santa Cruz Mountains and upwind emissions generated by San Francisco and other north Peninsula cities.

**Table 3.5-2  
Federal and State Air Quality Standards**

<b>Pollutant</b>	<b>Averaging Time</b>	<b>California Standard<sup>1</sup></b>	<b>Federal Standard<sup>2</sup></b>
Ozone	1-hour	0.09 ppm	0.12 ppm
	8-hour	—	0.08 ppm
Carbon Monoxide	1-hour	20.00 ppm	35.00 ppm
	8-hour	9.00 ppm	9.00 ppm
Nitrogen Dioxide	1-hour	0.25 ppm	—
	Annual Average	—	0.053 ppm
Sulfur Dioxide	1-hour	0.25 ppm	—
	3-hour	—	0.5 ppm
	24-hour	0.04 ppm	0.14 ppm
	Annual Average	—	0.03 ppm
Particulate Matter (PM <sub>10</sub> )	24-hour	50 $\mu\text{g}/\text{m}^3$	150 $\mu\text{g}/\text{m}^3$
	Annual Geometric Mean	20 $\mu\text{g}/\text{m}^3$	—
	Annual Arithmetic Mean	—	50 $\mu\text{g}/\text{m}^3$
Fine Particulate Matter (PM <sub>2.5</sub> )	24-hour	—	65 $\mu\text{g}/\text{m}^3$
	Annual Arithmetic Mean	12 $\mu\text{g}/\text{m}^3$	15 $\mu\text{g}/\text{m}^3$
Lead (Pb)	30-day Average	1.5 $\mu\text{g}/\text{m}^3$	—
	Calendar Quarter	—	1.5 $\mu\text{g}/\text{m}^3$

*Source:* Summarized by EIP Associates.

*Notes:*

ppm = parts per million by volume

$\mu\text{g}/\text{m}^3$  = micrograms per cubic meter

— = No standard exists for this category

1. California standards for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulate matter (PM<sub>10</sub>) are values that are not to be exceeded.
2. The form of the federal standards (i.e., how the standard is applied) varies from pollutant to pollutant. For further information, 40 CFR Part 50 includes the relevant form for each federal standard. The federal 8-hour ozone standard and the PM<sub>2.5</sub> standards were remanded by appeals court in 1999. Implementation of the standards may be abandoned or delayed.

**Table 3.5-3  
Health Effects Summary of the Major Criteria Air Pollutants**

Air Pollutant	Adverse Effects
Ozone	eye irritation respiratory function impairment
Carbon Monoxide	impairment of oxygen transport in the blood stream aggravation of cardiovascular disease impairment of central nervous system function fatigue, headache, confusion, dizziness can be fatal in the case of very high concentrations in enclosed places
Nitrogen Dioxide	risk of acute and chronic respiratory illness
Sulfur Dioxide	aggravation of chronic obstruction lung disease increased risk of acute and chronic respiratory illness
Lead	impairment of blood functions and nerve constriction behavioral and learning problems in children
Particulate Matter	may be inhaled and lodge in and irritate the lungs increased risk of chronic respiratory disease with long exposure altered lung function in children may produce acute illness with sulfur dioxide

*Source:* Bay Area Air Quality Management District.

TACs, which may have the potential to cause cancer or may pose a present or potential hazard to human health, are also regulated through federal, State, and local programs. Unlike criteria pollutants, there are no ambient standards for TACs; this is primarily due to the localized nature of the adverse health impacts caused by TAC emissions. Stationary sources of TACs are regulated through emission standards and risk reduction strategies implemented at the sources of the emissions, and mobile sources are not directly regulated as sources of TACs, except for lead. Improvement of fuel efficiency standards and reformulation of fuels provides indirect control of lead and other TACs from mobile sources.

**Air Quality Management Plan (AQMP).** The federal CAA, as amended, and the CCAA provide the legal framework for attaining and maintaining the ambient air quality standards. Both the federal and State acts require that CARB designate as “nonattainment areas” portions of the State where federal or State ambient air quality standards are not met. Where a pollutant exceeds standards, air quality management plans must be formulated that demonstrate how the standards will be achieved. These laws also provide the basis for the implementing agencies to develop mobile and stationary source performance standards.

BAAQMD is primarily responsible for planning, implementing, and enforcing the federal and State ambient standards in the Bay Area. EPA approval of the 1982 Bay Area Air Quality Plan (referred to as the 1982 Plan), which indicates how BAAQMD will implement federal air quality requirements, resulted in the 1982 Plan being incorporated into the State Implementation Plan (SIP). The region’s

SIP is a compilation of plan components and air pollution control regulations that when taken together are designed to enable the region to attain and maintain the federal standards. Along with the BAAQMD, the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) also contribute to the SIP. BAAQMD updated the 1982 Plan and adopted the *Bay Area '91 Clean Air Plan* to implement the requirements of the CCAA of 1988. As required by the CCAA and subsequent 1992 amendments, BAAQMD also prepared the *1994 Clean Air Plan Update*, the *Bay Area '97 Clean Air Plan*, and the *Bay Area 2000 Clean Air Plan*. The State ozone standard and the State PM<sub>10</sub> standard are exceeded in the region. To meet the State ozone standard, BAAQMD adopted the *2000 Clean Air Plan* on December 20, 2000 and submitted it to CARB as required by the CCAA. The *2000 Clean Air Plan* includes a control strategy review to ensure that the plan continues to include “all feasible measures” to reduce ozone. No State plan is required to meet state PM<sub>10</sub> measures.

In 1998, the Bay Area was redesignated as nonattainment for the federal ozone standards. Under EPA direction, BAAQMD prepared and submitted the *Bay Area Ozone Attainment Plan* in June 1999 as a revision to the SIP. This attainment plan was partially rejected by EPA. The parts of the 1999 Plan that were disapproved include ozone attainment assessment, consistency of regional transportation plans and programs with air quality attainment plans, and the Reasonably Available Control Measure (RACM) demonstration. In response to EPA’s disapproval of the 1999 Plan, a *Bay Area 2001 Ozone Attainment Plan* (Final Plan) was prepared in June 2001 by BAAQMD, MTC, and ABAG. This 2001 Plan was initially rejected by CARB prior to its submittal to EPA. Addenda to this plan were presented to CARB on November 1, 2001, approved and submittal to EPA. On February 14, 2002, EPA determined that the motor vehicle emission budgets in the *Bay Area's 2001 Ozone Attainment Plan* are adequate for conformity purposes.

The SIP measures for reducing emissions of reactive organic compounds and nitrogen oxides affect all source categories. Emissions limitations are imposed upon sources of air pollutants by rules and regulations promulgated by the federal, State, or local agencies. Mobile sources of air pollutants are largely controlled by federal and State agencies through emission performance standards and fuel formulation requirements. BAAQMD regulates stationary sources through its permitting and compliance programs. BAAQMD is responsible for implementing stationary source performance standards and other requirements of federal and State laws.

**Redwood City General Plan.** The *City of Redwood City Strategic General Plan* adopted in 1990 does not contain any policies or programs that specifically address the clean air goals of the community. However, the *Strategic General Plan* does include the following transportation systems management policies and programs that would contribute to improved air quality in the City:

- Policy TSM-1: Explore and consider alternative techniques and requirements within Redwood City as they pertain to various transportation modes including parking, land use, and traffic mitigation which would encourage the use of alternative transportation modes to meet or exceed the 25% goal as specified by the San Mateo County Transportation Systems Management Plan.

## Impacts and Mitigation Measures

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### Significance Criteria

According to Appendix G of the CEQA Guidelines (Environmental Checklist Form) a project would have a significant air quality effect if it would: (a) Conflict with or obstruct implementation of the applicable air quality plan; (b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation; (c) Result in a cumulatively considerable net increase of any criteria air pollutant for which the project region is in non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors); (d) Expose sensitive receptors to substantial pollutant concentrations; and (e) Create objectionable odors affecting a substantial number of people.

The BAAQMD recommends consideration of the following significance criteria for project operations:

- For operational impacts, an increase in combined stationary and mobile source emissions of more than 80 pounds/day of ROG, NO<sub>x</sub>, or inhalable particulates (PM<sub>10</sub>) over existing conditions would be considered significant.
- A project contributing to CO concentrations above the State ambient air quality standard would be considered to have a significant impact. (State ambient air quality standards for CO are shown in Table 3.5-2.)

Direct emissions sources are found on site and would include stationary sources and on-site mobile equipment. Examples of land uses and activities that generate direct emissions are industrial operations and sources subject to an operating permit by BAAQMD. Hospitals usually are not significant sources of direct emissions. Indirect emissions come from mobile sources that access the project site but generally emit off site. The primary source of long-term, indirect emissions associated with institutional projects such as a hospital is motor vehicle emissions.

CO emissions are considered significant if they will contribute to a violation of the State standards for CO (9 ppm averaged over 8 hours and 20 ppm for one hour). CO emissions are localized, and typically analyzed in terms of their impacts to specific roadway segments or intersections. The BAAQMD requires CO modeling if the project would add trips to intersections currently operating at LOS D, E, or F, or cause a decline to LOS D, E, or F.

**Cumulative Impacts.** Cumulative impacts on ozone for institutional projects, such as the Medical Center Master Plan, are based on the project's consistency with Redwood City's General Plan and its consistency with the regional AQMP. Projects consistent with the City's General Plan and the AQMP are not considered cumulatively significant, because the AQMP addresses attainment of the State ozone AAQS and maintenance of federal AAQS.

For CO, the cumulative impact threshold for direct emissions is the same as that for project-specific impacts (550 pounds/day direct of CO). For analysis of cumulative indirect CO emissions, cumulative

traffic impacts are compared to the same criteria listed above for project-specific indirect CO emissions.

A significant project-specific impact from PM<sub>10</sub> emissions would also be considered cumulatively significant, because the background concentration reflects the collective contribution of PM<sub>10</sub> from nearby sources. According to the Initial Study (Appendix B), implementation of the mitigation measures from the BAAQMD CEQA Guidelines would reduce the impacts of construction emissions of particulate matter to a less-than-significant level. As a result, this topic is not addressed further in this EIR.

## **Methodology**

In the following analysis, mobile and stationary source emissions of ROG, NO<sub>x</sub>, PM<sub>10</sub>, and CO were estimated using CARB's URBEMIS 2001 computer model assuming that project build out would be complete by 2025. Mobile source emissions estimates rely on vehicle trip generation rates derived from factors published by the Institute of Transportation Engineers (ITE) and project-specific vehicle turning movements. However, the ITE emission rate was not considered appropriate for application to the Medical Center Plan. A more accurate method was derived by conducting a survey of trip generation rates at Kaiser's medical clinic in the City of Roseville, California, a comparable facility to the Medical Center (see Section 3.4, Transportation).

BAAQMD recommends the use of CALINE4, a dispersion model for predicting localized CO concentrations, as the preferred method of estimating pollutant concentrations at sensitive receptors near congested roadways and intersections. For each intersection analyzed, CALINE4 adds roadway-specific CO emissions calculated from peak-hour turning volumes to the existing ambient CO air concentrations. For this analysis, CO concentrations were calculated based on a simplified CALINE4 screening procedure developed by BAAQMD and presented in its *CEQA Guidelines*. The simplified model is intended as a screening analysis in order to identify a potential CO hotspot. This methodology assumes worst-case conditions and provides a screening of maximum, worst-case CO concentrations.

## **Environmental Analysis**

As described in Section 3.1, for each impact, a level of significance is determined and is reported in the impact statement. Conclusions of significance are defined as follows: significant (S), potentially significant (PS), less than significant (LTS), and no impact (NI). If the mitigation measures would not diminish potentially significant or significant effects to a less-than-significant level, the impacts are classified as "significant unavoidable effects (SU)." For this section, AQ refers to Air Quality.

Potential air quality-related impacts associated with the Higher Occupancy Scenario could result from increased traffic caused by a more intensive use of the Medical Center due to a higher number of POs at the Medical Center. However, this scenario is dependent on the completion of all four MOBs. Therefore, this section only considers the Higher Occupancy Scenario in the cumulative air analysis.

*AQ-1. Operational Air Quality – Under the proposed project, project contributions of new mobile sources of air pollutants would not cause emissions of ROG, NO<sub>x</sub>, and PM<sub>10</sub> that would contribute substantially to an existing or projected air quality violation or be inconsistent with regional air quality plans to achieve attainment. As such, project impacts on criteria air pollutants would be less than significant. (LTS)*

**Mobile Source Emissions** Regional emissions caused by project-related traffic were estimated using CARB's URBEMIS 2001 computer program.<sup>2</sup> The URBEMIS model assesses the regionwide impacts of proposed land use development based on daily vehicle trips derived in the project's transportation analysis in Section 3.4, Transportation, of this EIR. The construction of MOB 1 and the replacement hospital at the Medical Center would result in a total of approximately 3,565 new vehicle trips to the site per day. Based on URBEMIS 2001 modeling results, these new project trips would generate approximately 29 pounds/day of ROG, 20 pounds/day of NO<sub>x</sub>, and 10 pounds/day of PM<sub>10</sub> over existing conditions in the year 2004 (see Table 3.5-4).<sup>3</sup> Although the replacement hospital is not anticipated to be built until 2009, 2004 was chosen for the model in order to be consistent with project's transportation analysis (Section 3.2).

As illustrated by Table 3.5-4, project-related emissions of ROG, NO<sub>x</sub>, and PM<sub>10</sub> would not exceed significance thresholds of 80 pounds/day. Therefore, emissions of these levels would not cause a significant impact.

**Stationary Source Emissions.** The proposed project would also result in nominal emissions from the use of electricity and natural gas for site heating, cooling, ventilation, and lighting. Emissions would be produced either directly at the site or indirectly through increased use of utility services.

The proposed CUP (to be constructed after the construction of MOB 1 and the replacement hospital) would be located on the south wing of the main hospital building, and would house mechanical equipment including: hot water boilers, steam generators, chillers and air handling for the HVAC system, compressed air and vacuum pumps, water softeners, and a tank for oxygen and other medical gases. The new CUP would also house electrical equipment including switchgear rooms, emergency generators, and a fuel tank. The hot water boilers and the steam generators associated with medical center facilities would primarily involve the emission of steam, which would not contain toxic contaminants. According to the *BAAQMD CEQA Guidelines*, Generalized Emission Factors for Selected Industry Groups, the average

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<sup>2</sup> URBEMIS 2001 Computer Program User's Guide, Version 3.2 - Emissions Estimations for Land Use Development Projects. California Air Resources Board and San Joaquin Valley Unified Air Pollution Control District, August 1998.

<sup>3</sup> The URBEMIS 2001 model uses emission factors from the CARB EMFAC 2001 emissions model. Vehicle operating characteristics are determined by each land use type in the proposed project and the setting of the project. Default values recommended by BAAQMD *CEQA Guidelines* are used for the average trip length. Worst-case summer (ozone season) temperatures are as recommended in Appendix H of the URBEMIS7G User's Guide, August 1998.

particulate matter emissions for a general hospital facility would be 2.9 lbs/acre/day. The new CUP would occupy 0.64 acres and would, therefore, generate approximately 1.9 pounds/day of particulate matter based on this approximation. This would be well below the BAAQMD significance threshold for PM<sub>10</sub>.

Fume hoods and other vents would also be installed at the Medical Center for small research and pharmacy laboratories. Similarly, these stationary source emissions would not be significant when compared to the emissions caused by project-related traffic.

**Table 3.5-4  
Proposed Project Air Emissions (2004)**

Scenario	ROG (lb/day)	NO <sub>x</sub> (lb/day)	PM <sub>10</sub> <sup>1</sup> (lb/day)
No Project	136	122	67
Proposed Project	165	142	77
<b>Proposed Project Net Emission</b>	<b>29</b>	<b>20</b>	<b>10</b>
BAAQMD Significance Threshold	80	80	80

*Source:* EIP Associates, 2002. Emissions estimated with CARB's URBEMIS 2001 model.

*Notes:*

1. Particulate matter includes entrained road dust.
2. Vehicle emissions in this analysis are based on model year 2004 fleets. Emissions in future years will decrease as a result of cleaner burning fuels and improved engine efficiency.

**AQ-2. Localized Air Quality** – *Under the proposed project and the Higher Occupancy Scenario, project traffic would create congestion at intersections in the project vicinity and in enclosed parking structures. This traffic would increase concentrations of carbon monoxide around the intersections and in the parking structure, but would not exceed the ambient air quality standards. As such, project impacts on localized CO concentrations would be less than significant. (LTS)*

Because project-related traffic would affect intersections currently operating at Level of Service (LOS) D, E, or F, project traffic has the potential to generate emissions of CO that could adversely affect localized air quality. Carbon monoxide build-up could occur around congested intersections. The *BAAQMD CEQA Guidelines* specifies that localized CO concentrations should be analyzed at intersections impacted by project traffic operating at LOS D, E, and F.<sup>4</sup> For this analysis, the CALINE4 program and the CO Protocol from the Institute of Transportation Studies was used to evaluate “worst-case” air quality conditions at five of the

<sup>4</sup> *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans*, April 1996, p.15.

most heavily affected and worst-performing intersections.<sup>5,6</sup> Emission factors were recommended by BAAQMD CEQA Guidelines.<sup>7</sup> For the model, receptors are located at 50, 100, and 300 feet from the center of the intersection and a stable atmospheric environment is assumed where dispersion of CO in the vicinity of the intersection would be minimal.

The transportation analysis in Section 3.4 of this EIR shows that many intersections along Veterans Boulevard operate at LOS D or worse during either the AM or the PM peak hours under both existing and future (2004 and 2025) conditions. The five intersections selected for analysis of CO impacts are chosen based on a combination of their likelihood to either operate at LOS D or worse with the project, carry a notable increase in traffic caused by the proposed project, or be located next to an air quality sensitive or residential land use.

Tables 3.5-5 and 3.5-6 show the modeled CO concentrations for each of the intersections considered in this analysis. The CO concentrations resulting from conditions at the Phase I build out year, both with and without the project, would not exceed either State or federal AAQS. Measures not related to the proposed project would cause further reductions of these concentrations as statewide emission control programs for motor vehicles continue to reduce ROG, NO<sub>x</sub>, and CO emissions in the future. These reductions are shown in the tables below for the conditions in year 2004 and 2025. Because the localized CO concentrations around these congested intersections would not violate the standards, impacts at project intersections would not be significant.

**AQ-3. TAC and Objectionable Odors** – *Neither the proposed project nor the Higher Occupancy Scenario would expose the public to toxic air contaminants or objectionable odors because TAC and odor emissions would not be substantial. (LTS)*

As mentioned in Impact AQ-1, the proposed project would result in nominal emissions from the use of electricity and natural gas for site heating, cooling, ventilation, and lighting. Emissions would be produced either directly at the site or indirectly through increased use of utility services. However, these sources are usually not associated with TAC emissions or objectionable odors.

Based on a review of BAAQMD's Toxic Air Contaminants Annual Report,<sup>8</sup> the Medical Center is not listed as a TAC source. In addition, the Medical Center does not currently

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<sup>5</sup> CALINE4 - *A Dispersion model for Predicting Air Pollutant Concentrations Near Roadways*. California Department of Transportation, Division of New Technology and Research, June 1989.

<sup>6</sup> *Transportation Project-Level Carbon Monoxide Protocol*. Institute of Transportation Studies, University of California, Davis, Revised December 1997.

<sup>7</sup> *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans*, April 1996. Table 10, p. 35.

<sup>8</sup> Bay Area Air Quality Management District, *Toxic Air Contaminants 2000 Annual Report*, for San Mateo County and Redwood City, December 2001.

**Table 3.5-5  
Localized 1-hour CO Concentrations at Selected Intersections**

1-Hour Total CO Concentrations (ppm) <sup>1</sup>						
Location	1-hr Standard <sup>2</sup>	Year 2002 Existing	Year 2004 Background plus Project	Year 2025 Future	Year 2025 Future plus Project	Year 2025 Future plus Higher Occupancy Scenario
Whipple/ Veterans	20 ppm	9.2	8.7	9.2	9.2	9.3
Walnut/ Veterans	20 ppm	7.2	7.1	6.9	7.0	7.1
Maple/ Veterans	20 ppm	7.2	7.0	6.8	6.9	7.2
Hansen/ Veterans	20 ppm	6.8	6.7	6.6	6.7	6.8
Woodside/ Veterans	20 ppm	9.3	8.9	8.8	9.0	9.1

Source: EIP Associates, 2002.

Notes:

1. Total concentrations are based on CALINE4 output including background ambient 1-hour CO concentrations of 5.2 ppm for year 2003.
2. The State one-hour standard is 20 ppm; the federal standard is 35 ppm. The more stringent standard is reflected in the table.

**Table 3.5-6  
Localized 8-hour CO Concentrations at Selected Intersections**

8-Hour Total CO Concentrations (ppm) <sup>1</sup>						
Location	8-hr Standard <sup>2</sup>	Year 2002 Existing	Year 2004 Background plus Project	Year 2025 Future	Year 2025 Future plus Project	Year 2025 Future plus Higher Occupancy Scenario
Whipple/ Veterans	9 ppm	6.4	6.1	6.4	6.4	6.5
Walnut/ Veterans	9 ppm	5.0	5.0	4.8	4.9	5.0
Maple/ Veterans	9 ppm	5.0	5.0	4.8	4.8	5.1
Hansen/ Veterans	9 ppm	4.7	4.7	4.6	4.7	4.8
Woodside/ Veterans	9 ppm	6.5	6.5	6.3	6.3	6.4

Source: EIP Associates, 2002.

Notes:

1. Total concentrations are based on CALINE4 output including background ambient 8-hour CO concentrations of 3.6 ppm for year 2003.
2. The State and federal eight-hour standard is 9 ppm.

operate any equipment that emits TACs nor are there any plans to in the future. All hazardous waste generated on site is transported to an off-site disposal or recycling facility (see Section 3.8, Hazards and Hazardous Materials). Therefore, emissions of TAC or objectionable odors are not considered a significant impact.

## Cumulative Analysis

**AQ-4. Cumulative Air Quality** – *Neither the proposed project's nor the Higher Occupancy Scenario's contributions to regional air emissions would be significant, therefore, the project's cumulative effect would also not be a significant impact. (LTS)*

The state CEQA Guidelines state that agencies shall consider whether the cumulative impact of a project is significant and whether the proposed project's incremental effects are cumulatively considerable. BAAQMD CEQA Guidelines recommend that lead agencies conclude that a significant cumulative air quality impact would result if the proposed project would individually have a significant air quality impact.<sup>9</sup> The analysis for Impact AQ-1 indicates that the proposed project would not cause potentially significant regional impacts of criteria air pollutants from motor vehicle trips and stationary source operation when the first phase of the project is completed in 2004. In addition, when the buildout of the Medical Center is completed (2025), criteria air pollutants are expected to be approximately 17 pounds/day of ROG, 9 pounds/day of NO<sub>x</sub>, and 11 pounds/day of PM<sub>10</sub> over the no project scenario for the proposed project and approximately 48 pounds/day of ROG, 35 pounds/day of NO<sub>x</sub>, and 43 pounds/day of PM<sub>10</sub> for the Higher Occupancy Scenario (see Table 3.5-7), all less than the BAAQMD threshold of 80 pounds/day. Also, localized CO concentrations in the long-term cumulative conditions would also be less than the AAQS (see Tables 3.5-5 and 3.5-6).

Cumulative air quality impacts would be limited to regional emissions. Incorporating Mitigation Measure TR-3.4, Reduce Project-related Motor Vehicle Emissions through Alternate Transportation Facilities, would minimize the adverse regional impacts caused by project emissions. Mitigation Measure TR-3.4 would help reduce vehicle trips and minimize cumulative impacts to regional air quality.<sup>10</sup> In addition, implementation of Mitigation Measure TR-3.4 would be consistent with Policy TSM-1 of the City of Redwood City Strategic General Plan; therefore, the cumulative impacts to regional air quality would not be significant.

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<sup>9</sup> BAAQMD, *CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans*, April 1996, Chapter 2.3, p. 18.

<sup>10</sup> These transportation-related measures are derived from the Traffic Impact Analysis prepared by Fehr and Peer Associates, October 2002.

**Table 3.5-7  
Proposed Project Plus Cumulative Air Emissions (2025)**

<b>Scenario</b>	<b>ROG (lb/day)</b>	<b>NO<sub>x</sub> (lb/day)</b>	<b>PM<sub>10</sub><sup>1</sup> (lb/day)</b>
No Project	67	53	68
Proposed Project	84	62	79
Higher Occupancy Scenario	115	88	111
<b>Proposed Project Net Emission</b>	<b>17</b>	<b>9</b>	<b>11</b>
<b>Higher Occupancy Scenario Net Emission</b>	<b>48</b>	<b>35</b>	<b>43</b>
BAAQMD Significance Threshold	80	80	80

*Source:* EIP Associates, 2002. Emissions estimated with CARB's URBEMIS 2001 model.

*Notes:*

1. Particulate matter includes entrained road dust.
2. Vehicle emissions in this analysis are based on model year 2020 fleets, URBEMIS 2001 does not extend to 2025 conditions. Emissions in future years will decrease as a result of cleaner burning fuels and improved engine efficiency. Therefore, emission estimates are conservative.