
5. AIR QUALITY

This SEIR chapter describes the air quality implications of the proposed Stanford Outpatient Center, focusing on associated changes in the Midpoint Technology Park project, or changes in regulatory provisions, from those addressed in the 1996 EIR and 1998 SEIR. The BAAQMD has prepared, and periodically updates, air quality impact guidelines for use in preparing environmental documents under the California Environmental Quality Act (CEQA). This chapter: (1) utilizes updated BAAQMD-specified methods of air quality analysis; (2) incorporates traffic forecasts that reflect the proposed changes in project site land use, completed and planned local roadway improvements, currently anticipated local and regional cumulative growth, and changes in travel patterns which have occurred since certification of the 1996 EIR and 1998 SEIR; and (3) applies current (updated) regulatory standards and associated significance thresholds. This air quality chapter was prepared with the assistance of Donald Ballanti, air quality management consultant and certified meteorologist. The traffic data applied in this air quality chapter is derived from the traffic analysis included in chapter 12 (Transportation, Circulation, and Parking) of this SEIR.

5.1 SETTING

The 1996 EIR provides a comprehensive description of existing regional air quality conditions. Updated information relevant to the proposed project changes and pertinent air quality standards is provided below.

5.1.1 Air Quality Standards

Both the U. S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have established, and periodically update, ambient air quality standards for common pollutants (e.g., ozone, carbon monoxide). The standards represent safe levels of contaminants that avoid specific adverse health effects associated with each pollutant. The standards cover what are called "criteria" pollutants, referring to the fact that the health and other effects of these particular pollutants are described in criteria documents. The national and state standards have been set at levels that protect groups that are more sensitive (e.g., asthmatics). California has adopted more stringent standards for some pollutants. Table 5.1 summarizes current national and state air quality standards.

In addition to criteria pollutants, toxic air contaminants (TACs) are another group of pollutants of concern, particularly with respect to diesel exhaust emissions. TACs are injurious in small quantities and are regulated despite the absence of criteria documents. Unlike criteria pollutants, TACs are regulated on the basis of risk rather than specification of safe levels of contamination.

Table 5.1
FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

<u>Pollutant</u>	<u>Averaging Time</u>	<u>Federal Primary Standard</u>	<u>State Standard</u>
Ozone	1-Hour	0.12 ppm	0.09 ppm
	8-Hour	0.08 ppm	0.07 ppm
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35.0 ppm	20.0 ppm
Nitrogen Dioxide	Annual	0.05 ppm	---
	1-Hour	---	0.25 ppm
Sulfur Dioxide	Annual	0.03 ppm	---
	24-Hour	0.14 ppm	0.05 ppm
	1-Hour	---	0.25 ppm
Particulates (PM ₁₀)	Annual	50 ug/m3	20 ug/m3
	24-Hour	150 ug/m3	50 ug/m3
Particulates (PM _{2.5})	Annual	15 ug/m3	12 ug/m3
	24-Hour	65 ug/m3	--
Lead (Pb)	3-Month	1.5 ug/m3	--
	30-Day	--	1.5 ug/m3
Sulfates	24-Hour	25 ug/m3	--
Hydrogen Sulfide	1-Hour	0.03 ppm	--
Vinyl Chloride	24-Hour	0.01 ppm	--

SOURCE: Donald Ballanti, Certified Consulting Meteorologist, February 2006; and California Air Resources Board, Ambient Air Quality Standards (<http://www.arb.ca.gov/aqs/aqs2.pdf>).

ppm = parts per million

ug/m3 = micrograms per cubic meter

5.1.2 Current Air Quality

The Bay Area Air Quality Management District (BAAQMD) enforces rules and regulations regarding air pollution sources and is the primary agency preparing the regional air quality plans mandated under state and federal law. The BAAQMD monitors air quality at several locations within the San Francisco Bay Air Basin, including one in Redwood City. Table 5.2 summarizes recent exceedances of the federal and state standards at the Redwood City monitoring station. The table indicates that, over the previous three years, all federal and state ambient air quality standards have been met in the project vicinity with the exception of the state standards for ozone and PM₁₀.

5.1.3 Sensitive Receptors in the Project Vicinity

The BAAQMD defines "sensitive receptors" as facilities where sensitive receptor population groups (e.g., children, the elderly, the acutely ill, and chronically ill) are likely to be located. Such facilities include medical clinics, as well as residences, schools, playgrounds, child care centers, retirement homes, convalescent homes, and hospitals. In the project vicinity, the Broadway Towers Apartment complex is adjacent to the project site on the east, the Friendly Acres single-family residential neighborhood is farther east, Andrew Spinus Park is southeast of the site across Broadway, Taft Elementary School at 917 10th Avenue is approximately one-half mile southeast, Hi-Tech High School at 890 Broadway is approximately one-half mile west, and Hoover Park and Elementary School are about one-half mile southwest of the project site.

5.2 PERTINENT PLANS AND POLICIES

5.2.1 Redwood City Strategic General Plan

The adopted Redwood City Strategic General Plan Land Use and Conservation Elements (both adopted in 1990) contain the following objective and policy related to air quality and pertinent to the proposed project:

- *The City should take into consideration the cumulative air quality impacts from proposed developments and should establish and enforce appropriate land use as well as other regulations to reduce air pollution.* (Land Use Policy L-13, page 6-6)
- *Promote expansion and improvement of public transportation services and facilities, where appropriate, for their air quality benefits.* (Conservation Policy C-1, page 10-4)

5.2.2 Regional Air Quality Plan

The federal Clean Air Act and the California Clean Air Act of 1988 require the California Air Resources Board, based on air quality monitoring data, to designate as "nonattainment areas" those portions of the state where the federal or state ambient air quality standards are not met. Due to the differences between the national and state standards, the designation of nonattainment areas is different under the federal and state legislation. Under the California Clean Air Act, San Mateo County is classified as a nonattainment area for ozone and particulate matter (PM₁₀ and PM_{2.5}). The county is either in attainment or unclassified for other pollutants.

Table 5.2
AIR QUALITY DATA FOR REDWOOD CITY, 2003 TO 2005

<u>Pollutant</u>	<u>Standard</u>	<u>Days Exceeding Ambient Standards During:</u>		
		<u>2003</u>	<u>2004</u>	<u>2005</u>
Ozone	Federal 1-Hour	0	0	0
Ozone	State 1-Hour	1	1	0
Ozone	Federal 8-Hour	0	0	0
Carbon Monoxide	State/Federal 8-Hour	0	0	0
Nitrogen Dioxide	State 1-Hour	0	0	0
PM ₁₀	Federal 24-Hour	0	0	0
PM ₁₀	State 24-Hour	0	1	0
PM _{2.5}	Federal 24-Hour	0	0	0

SOURCE: California Air Resources Board, Aerometric Data Analysis and Management (ADAM), 2005 (<http://www.arb.ca.gov/adam/cgi-bin/adamtop/d2wstart>).

5.3 PREVIOUS EIR FINDINGS PERTINENT TO THE PROPOSED PROJECT CHANGES

The Final EIR for the Midpoint Technology Park (December 1996) set forth the following certified impact and mitigation findings which remain applicable to the proposed project changes and would help to ensure that the air quality effects of the proposed project changes would be less-than-significant (only those air quality impact and mitigation findings applicable to the proposed project changes are listed):

Impact 4-1: Air Quality Impact Vehicular Emissions. Expansion of...office/R&D space will add more trips and potentially aggravate the CO and ozone problems.

Certified Mitigation 4-1(a-c and e-h). Refer to certified mitigation under [Transportation, Circulation, and Parking].

Certified Mitigation 4-1(e). Facilitate pedestrian access to bus transit stops.

Regarding this impact, new and modified mitigations specific to the proposed Stanford Outpatient Center project are included in chapter 12 (Transportation, Circulation, and Parking) of this SEIR.

Impact 4-2: Construction Emissions Impact. Earth moving,...renovating buildings, and buildings new buildings [e.g., expanded lobbies, covered walkways, and possibly parking decks] will release dust and related suspended particulate. The level of impact could be significant, especially near construction sites.

Certified Mitigation 4-2a. Areas of soil redistribution should be watered down twice daily or more, if necessary, to trap fugitive dust and particulate during construction until planting, grass growth, or building coverage reduces the need for such measures.

Certified Mitigation 4-2b. If water is limited, soil binders such as Asoil cement® may be spread in conjunction with watering, or sheet coverings such as burlap may be used on small areas. Areas covered with soil binders should be turned over prior to revegetation.

Certified Mitigation 4-2c. During periods of excessive wind (i.e., gusting to 30 mph or more), construction involving soil disturbance should be temporarily suspended.

Certified Mitigation 4-2d. Disturbed soils should be planted or paved as soon as possible to reduce construction-related dust.

The requirements of Certified Mitigations 4-2(a-d) above have been incorporated into *Supplemental Mitigation 5-1* of this SEIR. *Supplemental Mitigation 5-1* is consistent with current Redwood City requirements and the latest BAAQMD CEQA Guidelines (revised December 1999).

5.4 SUPPLEMENTAL IMPACT AND MITIGATION FINDINGS

5.4.1 Supplemental Analysis Scope

The scope of this supplemental air quality analysis is limited to identification of the mitigating (beneficial) effects of, and any additional adverse impacts associated with, the proposed project changes.

5.4.2 Significance Criteria

The BAAQMD has revised recommended thresholds of significance since publication of the 1996 Midpoint Technology Park EIR. The latest BAAQMD CEQA Guidelines¹ provide the following definitions of a significant air quality impact:

- (a) Any project contributing to carbon monoxide (CO) concentrations exceeding the State Ambient Air Quality Standard of 9 parts per million (ppm) averaged over 8 hours, or 20 ppm for 1 hour.
- (b) Any project that generates criteria air pollutant emissions in excess of the BAAQMD *[specified]* annual or daily thresholds. The current thresholds are 15 tons per year or 80 pounds per day for reactive organic gases (ROG), nitrogen oxides (NO_x), or PM₁₀. Any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact.
- (c) Any project with the potential to frequently expose members of the public to objectionable odors.
- (d) Any project with the potential to expose sensitive receptors or the general public to substantial levels of toxic air contaminants (TACs).
- (e) Any project that does not apply appropriate dust-control measures during construction. The BAAQMD significance thresholds for construction dust impacts are based on the appropriateness of construction dust controls. The BAAQMD Guidelines provide feasible control measures for construction emissions of PM₁₀. If the appropriate construction controls are to be implemented, then air pollutant emissions for construction activities would be considered less-than-significant.

Regarding significance criterion (c) above, the Initial Study (appendix 18.1 of this SEIR) determined that the proposed project would have a less-than-significant impact; therefore, this criterion is not discussed in this chapter.

5.4.3 Pertinent Project Changes

For the purposes of this air quality evaluation, the key project changes are:

- The proposed change in land use from office/R&D use to medical clinic, and associated changes in traffic volumes and trip distribution due primarily to patients visiting the

¹Bay Area Air Quality Management District. BAAQMD CEQA Guidelines, 1996 (Revised December 1999).

Outpatient Center throughout the day (see chapter 12--Transportation, Circulation, and Parking--of this SEIR);

- The introduction of on-site medically related hazardous materials that could result in toxic air emissions under upset conditions, a situation that was not present when the existing buildings were previously occupied by office/R&D uses (see chapter 7--Hazards and Hazardous Materials--of this SEIR); and
- The introduction of additional diesel-powered emergency generators that will emit diesel exhaust, which contains criteria pollutants and toxic air contaminants (TACs), during their periodic testing or operation during an emergency.

Mitigations for impacts resulting from these project changes are described below.

5.4.4 Supplemental Impacts and Mitigations

Supplemental Impact 5-1: Project Construction Period Emissions. Although limited to renovation of existing buildings and grounds, project construction activities, including excavation and grading for the proposed underground storm water retention basins, landscaping modifications, new underground utilities, possible future parking decks, associated construction vehicle traffic (including exhaust emissions), and wind blowing over exposed earth, would generate a combination of fugitive particulate matter emissions and exhaust emissions that would affect local air quality. These possible effects represent a ***potentially significant impact*** (see criteria [a], [b], and [e] in subsection 5.3.2, "Significance Criteria," above). This impact is similar to Impact 4-2 identified in the 1996 Midpoint Technology Park EIR. The following modified mitigation, however, corresponds with the current BAAQMD CEQA Guidelines.

The proposed project changes would require excavating and grading for the underground water retention basin, landscaping modifications, new underground utilities, and one or more possible future parking decks (see Supplemental Mitigation 12-3). In addition to the dust created during excavation and grading, substantial dust emissions could be created as debris is loaded onto trucks and transported for disposal.

Construction activities would also generate vehicular and equipment exhaust emissions that could affect local air quality.

Supplemental Mitigation 5-1. Dust emissions from demolition and construction activities can be greatly reduced by implementing fugitive dust control measures. The significance of construction period particulate impacts is, according to the BAAQMD Guidelines, determined by whether or not appropriate dust control measures are implemented. Implementation of the following conventional BAAQMD-recommended dust control measures would be expected to reduce dust emission impacts to a ***less-than-significant level***:

(continued)

Supplemental Mitigation 5-1 (continued):

- (a) Watering shall be used to control dust generation during any break-up of pavement;
- (b) All trucks hauling construction debris from the site shall be covered;
- (c) Whenever possible, dust-proof chutes shall be used for loading debris onto trucks;
- (d) Water all active construction areas at least twice daily and more often during windy periods (i.e., gusting to 30 mph or more). Active construction areas adjacent to existing land uses must be kept damp at all times, or must be treated with non-toxic stabilizers or dust palliatives;
- (e) Water or cover all stockpiles of debris, soil, sand, or other materials that can be blown by the wind;
- (f) Cover all trucks hauling soil, sand, and other loose materials, or require all trucks to maintain at least two feet of freeboard;
- (g) Sweep daily (preferably with water sweepers) all paved access roads, parking areas, and staging areas at construction sites;
- (h) Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets;
- (i) Hydroseed or apply non-toxic soil stabilizers to inactive construction areas;
- (j) Enclose, cover, water twice daily, or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.);
- (k) Install sandbags or other erosion control measures to prevent silt runoff to public roadways; and
- (l) Replant vegetation in disturbed areas as quickly as possible.

In addition, to reduce potential construction vehicle and equipment exhaust emissions to a ***less-than-significant level***:

- (m) Maintain properly tuned engines and equipment, minimize idling time, and limit the hours of operation of heavy duty equipment and/or the amount of equipment in use.

Supplemental Impact Due to Changes in Carbon Monoxide Concentrations. Carbon monoxide (CO) is an odorless, colorless, poisonous gas whose primary source in the Bay Area is automobiles. Concentrations of CO are typically highest near intersections of major roads. At the local level, the proposed Stanford Outpatient Center would increase traffic and alter trip distribution on the local street network, thereby changing CO levels along roadways used by project traffic.

Carbon monoxide concentrations under worst-case meteorological conditions have been predicted for the three signalized project-affected study intersections with the highest levels of project-related and/or project-plus-cumulative congestion (see chapter 12--Transportation, Circulation, and Parking--of this SEIR); the three intersections are: Woodside/Veterans, Woodside/Broadway, and Woodside/Middlefield. Peak-hour traffic volumes were applied to the screening form of the CALINE-4 dispersion model to predict maximum 1- and 8-hour CO concentrations near these intersections for existing, background, project (increases in traffic associated with the project changes), and cumulative conditions. The model results were used to predict the maximum 1- and 8-hour concentrations for CO. (Appendix 18.2 of this SEIR provides a description of the model and a discussion of the methodology and assumptions used in the analysis.)

Table 5.3 displays the results of the CALINE-4 analysis. The peak 1-hour concentrations are to be compared to the federal 1-hour standard of 35 ppm and the state standard of 20 ppm. The 8-hour concentrations are to be compared to the state and federal standard of 9 ppm.

Table 5.3 indicates that project traffic changes would increase CO concentrations at the study intersections by up to 0.1 ppm, but concentrations for existing, background, project, and cumulative traffic conditions would remain below the most stringent state or federal standards. Changes in project traffic would not result in any new violations of the 1-hour or 8-hour standards for CO, nor contribute substantially to an existing or projected violation, project and cumulative impacts on local CO concentrations, and are therefore considered to be **less-than-significant**, confirming the conclusions of the 1996 Midpoint Technology Park EIR and 1998 SEIR.

Supplemental Mitigation. No significant project or cumulative impact has been identified; no mitigation is required.

Supplemental Impact Due to Changes in Long-Term Regional Emissions. The proposed Stanford Outpatient Center would generate approximately 3,700 daily vehicle trips beyond those anticipated from the previously approved @Home development on the site (see chapter 12 of this SEIR). Regional emissions of reactive organic gases (ROG), nitrogen oxides (NO_x), and PM₁₀ associated with project vehicle use have been calculated using the URBEMIS-2002 emission model. (The URBEMIS-2002 model and the conditions assumed in its use are described in appendix 19.2 of this SEIR.)

Table 5.4 identifies: (1) total daily emissions and the incremental daily emission increases associated with project trip generation (compared with the previously approved project) for ROG, NO_x (two precursors of ozone), and PM₁₀; (2) the emission estimates from office/R&D use of the site as assumed in the 1996 Midpoint Technology Park EIR; and (3) the BAAQMD's thresholds of significance for these pollutants.

Table 5.3
 PROJECTED CURBSIDE CARBON MONOXIDE CONCENTRATIONS AT MAJOR
 INTERSECTIONS (IN PARTS PER MILLION)

<u>Intersection</u>	<u>Existing (2006)¹</u>		<u>Background (2006)</u>		<u>Project (2006)</u>		<u>Cumulative (2010)</u>	
	<u>1-Hour</u>	<u>8-Hour</u>	<u>1-Hour</u>	<u>8-Hour</u>	<u>1-Hour</u>	<u>8-Hour</u>	<u>1-Hour</u>	<u>8-Hour</u>
Woodside/ Veterans	11.4	5.9	12.2	6.5	12.2	6.5	11.1	5.8
Woodside/ Broadway	12.7	6.8	13.7	7.5	13.8	7.6	12.3	6.6
Woodside/ Middlefield	13.1	7.1	13.9	7.6	13.9	7.6	12.4	6.7
Most Stringent Standard	20.0	9.0	20.0	9.0	20.0	9.0	20.0	9.0

SOURCE: Donald Ballanti, Certified Consulting Meteorologist, February 2006.

¹The year in each column refers to the emissions factors used in the comparative calculations. Over time, emissions factors are reduced as older vehicles are replaced with lower-polluting, newer vehicles. Therefore, "cumulative" future (e.g., 2010) emissions are typically lower than "existing" emissions. In the table, constant 2006 emissions factors were applied to "existing," "background," and "project" conditions to make direct comparisons under a worst-case scenario, consistent with CEQA.

Table 5.4
 PROJECT CHANGES IN REGIONAL EMISSIONS (IN POUNDS PER DAY)

<u>Scenario</u>	<u>ROG</u>	<u>NO_x</u>	<u>PM₁₀</u>
Previously Approved Office/R&D Use Emissions	23.3	23.3	24.1
Proposed Outpatient Center Emissions	36.9	35.7	33.7
Net Increase	13.6	12.4	9.6
BAAQMD Significance Threshold	80.0	80.0	80.0

SOURCE: Donald Ballanti, Certified Consulting Meteorologist, February 2006.

ROG = reactive organic gases
 NO_x = nitrogen oxides
 PM₁₀ = particulate matter, 10 microns

Neither total project emissions nor the incremental increase over the previous office/R&D use of the site (at full occupancy) would exceed the thresholds of significance for ozone precursors (ROG and NO_x) or PM₁₀.

Therefore, consistent with the BAAQMD CEQA Guidelines, the emission increases associated with the proposed Stanford Outpatient Center project changes would constitute a ***less-than-significant project impact*** on regional air quality.

Section 2.3 of the BAAQMD CEQA Guidelines states, "For any project that does not individually have significant operational air quality impacts, the determination of significant cumulative impact should be based on an evaluation of the consistency of the project with the local general plan *and* of the general plan with the regional air quality plan [i.e., BAAQMD Clean Air Plan]."⁶ First, the proposed Stanford Outpatient Center project is consistent with the Redwood City Strategic General Plan and Redwood City Zoning Ordinance (see subsection 9.3.4 in chapter 9, Land Use, of this SEIR); project approval would not require a General Plan Amendment or rezoning. Secondly, as discussed in this Air Quality chapter and in chapter 7 (Hazards and Hazardous Materials), the proposed project would be subject to BAAQMD-mandated and other local, state, and federal agency regulations that would result in *less-than-significant* air quality and hazards/hazardous materials impacts. Finally, the proposed project is subject to the Congestion Management Plan (CMP) of the City/County Association of Governments of San Mateo County (C/CAG), whose guidelines are consistent with the regional air quality plan and Association of Bay Area Governments (ABAG) population projections (see chapter 12--Transportation, Circulation, and Parking--of this SEIR). Therefore, consistent with the BAAQMD CEQA Guidelines, the emission increases associated with the proposed Stanford Outpatient Center project changes would constitute a ***less-than-significant cumulative impact*** on regional air quality.

Supplemental Mitigation: No additional significant project or cumulative impact on long-term regional air quality has been identified; no additional mitigation is required.

Supplemental Impact Due to New Sources of Toxic Air Contaminants. The proposed Stanford Outpatient Center would include four back-up diesel-powered generators, two of which were included in the previously approved @Home project on-site. In 1998 the California Air Resources Board identified particulate matter from diesel-fueled engines as a toxic air contaminant (TAC). Stationary diesel engines are subject to the permitting authority of the BAAQMD. The emergency generator engines would normally be tested a few hours per month; per BAAQMD regulations, standby engine operation is limited to no more than 200 hours per calendar year for non-emergency uses.

Due to the projected limited usage of the emergency generators subject to BAAQMD regulations, the proposed Stanford Outpatient Center would result in a ***less-than-significant impact*** associated with toxic air contaminant (TAC) risk.

Supplemental Mitigation: No additional significant project impact has been identified; no additional mitigation is required.

