4.2 - Air Quality and Greenhouse Gas Emissions

4.2.1 - Introduction

This section describes the existing air quality setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are summarized from and based on information contained in the UHSP Air Quality Analysis Report, prepared in November 2007 by MBA, included in this EIR as Appendix B.

4.2.2 - Environmental Setting

The quality of the air we breath at any given time is the result of the complex interaction of a number of physical, natural, and man-made conditions including climate, topography, temperature, wind, the location, type, and amount of various air pollutants emitted by human activities, etc. The following sections briefly describe these conditions from the project air quality study (MBA 2007).

Climate and Local Weather Influence

The project site is located in the north end of the City of San Bernardino, on the northern border of the South Coast Air Basin (Basin). The Basin is bounded on the west by the Pacific Ocean and on the north and east by the San Gabriel, San Bernardino, and San Jacinto Mountains. The southern limit of the basin is the San Diego County line. The Basin consists of Orange County, Los Angeles County, the western portion of Riverside County, and the western portion of San Bernardino County. A semi-permanent, high-pressure zone generally impacts the region, resulting in a Mediterranean-type climate characterized by warm summers, mild winters, and infrequent rainfall. The local dominant wind blows from the west and northwest, although sometimes during the year this pattern changes when hot dry "Santa Ana" winds blow out of the Cajon Pass northwest of the site.

Regional and local air quality is strongly affected by topography, atmospheric inversions, dominant airflows, location, season and time of day. Dominant airflows provide the driving mechanism for transport and dispersion of air pollution. The mountains surrounding the region form natural horizontal barriers to the dispersion of air contaminants. Air pollution created in the coastal areas and around the Los Angeles area is transported inland until it reaches the mountains where the combination of mountains and inversion layers generally prevent further dispersion. This poor ventilation results in a gradual degradation of air quality from the coastal areas to inland areas.

Temperature inversions limit the vertical depth through which pollution can be mixed. During the summer, coastal areas are characterized by a sharp discontinuity between the cool marine air at the surface and the warm, sinking air aloft within the high-pressure cell over the ocean to the west. This marine/subsidence inversion allows for good local mixing, but acts like a giant lid over the basin. The air remains stagnant, as the average wind speed in downtown Los Angeles becomes less than 5 miles per hour (mph). A second type of inversion forms on clear winter nights when cold air off the mountains to the south sinks to the valley floor while the air aloft over the valley remains warm. This forms radiation inversions. These inversions, in conjunction with calm winds, trap pollutants such as

those from automobile exhaust near their source. They lead to air pollution "hot spots" in heavily developed coastal areas of the basin, but onshore breezes often push the pollutants along canyons into the inland valleys. Summers are often periods of hazy visibility and occasionally unhealthful air, while winter air quality impacts tend to be highly localized and can consist of odors or dust from agricultural operations.

Air Pollutants

Air pollutants are classified as either primary or secondary pollutants. Primary pollutants are generated daily and emitted directly from the source, whereas secondary pollutants are created over time and occur within the atmosphere as chemical and photochemical reactions take place. Examples of primary pollutants include carbon monoxide (CO), nitrogen dioxide (NO_2) and nitrogen or nitrous oxide (NO), sulfur dioxide (SO_2), large particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$), and various hydrocarbons or volatile organic compounds (VOC). Primary sources of air pollutants from the Proposed Project are expected to originate from motor vehicles (primarily CO, NOx, and VOC) during construction and operation, and fugitive dust during the construction phase. Examples of secondary pollutants include ozone, which is a product of the reaction between NOx and VOC in the presence of sunlight. Other secondary pollutants include photochemical aerosols. Secondary pollutants represent a large air quality problem in the basin. More detailed information on pollutant characteristics and mechanisms of pollutant origination are described in the project air quality report (MBA 2007).

Ambient Air Quality Standards

Ambient air quality standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect "sensitive receptors," those most susceptible to further respiratory distress such as asthmatics, the elderly, young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations above the ambient air quality standards before adverse effects are observed. The standards currently in effect in California and the United States are shown in Table 4.2-1.

Table 4.2-1: Ambient Air Quality Standards

Air Pollutant	Averaging Time	California Standard	National Standard	Most Relevant Effects
Ozone (O^3)	1 Hour 8 Hour	0.09 ppm 0.070 ppm	0.12 ppm 0.08 ppm	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals. (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage

Table 4.2-1: Ambient Air Quality Standards (Cont.)

Air Pollutant	Averaging Time	California Standard	National Standard	Most Relevant Effects
Carbon Monoxide (CO)	1 Hour 8 Hour	20 ppm 9.0 ppm	35 ppm 9 ppm	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
Nitrogen Dioxide (NO_2)	1 Hour Mean	0.25 ppm -	- 0.053 ppm	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide (SO_2)	1 Hour 24 Hour Mean	0.25 ppm 0.04 ppm -	- 0.14 ppm 0.030 ppm	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Particulate Matter (PM_{10})	24 Hour Mean	50 µg/m^3 20 µg/m^3	150 µg/m^3 -	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children; (c) Increased risk of premature death from heart or lung diseases in elderly
Particulate Matter ($PM_{2.5}$)	24 Hour Mean	- 12 µg/m^3	35 µg/m^3 15 µg/m^3	
Sulfates	24 Hour	25 µg/m^3	-	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	30-day Quarter	1.5 µg/m^3 -	- 1.5 µg/m3	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility Reducing Particles	Extinction coefficient of 0.23 kilometer – visibility of ten miles or more due to particles when relative humidity is less than 70%		-	Visibility impairment on days when relative humidity is less than 70 percent.

Abbreviations: ppm = parts per million (concentration); µg/m3 = micrograms per cubic meter;
Mean = Annual Arithmetic Mean; 30-day = 30-day average; Quarter = Calendar quarter
Source for relevant effects: South Coast Air Quality Management District, 2003 AQMP.
Source for standards: California Air Resources Board, Ambient Air Quality Standards, 2007

Baseline Ambient Air Quality

Existing levels of ambient air quality and historical trends and projections of air quality in the project area are best documented from measurements made near the project site. The California Air Resources Board (CARB) keeps records of monitored values at its monitoring stations. The nearest CARB monitoring station is San Bernardino monitoring station on 4th Street, which is approximately 10 miles southeast of the project site. Table 4.2-2 summarizes 2004-2006 published monitoring data.

The data show that ozone and both types of particulate matter (dust) (PM_{10} and $PM_{2.5}$) are recognized air quality problems in the area, as all years experienced violations of the federal standards.

Table 4.2-2: Ambient Air Quality – San Bernardino, California (2004-2006)

Air Pollutant	Most Stringent Air Quality Standard	Year, Maximum Concentration (days exceeding standard)			Exceeded Ambient Standards?
		2004	2005	2006	
Ozone (O_3)					
1-Hour	0.09 ppm [a]	0.157 (55)	0.163 (54)	0.160 (47)	Yes
8-Hour	0.070 ppm [b]	0.129 (39)	0.129 (58)	0.123 (49)	Yes
Carbon Monoxide (CO)					
1-Hour	20 ppm [a]	3 (0)	3 (0)	3 (0)	No
8-Hour	9.0 ppm [a]	2.1 (0)	2.1 (0)	2.30 (0)	No
Nitrogen Dioxide (NO_2)					
Mean	0.030 ppm [a]	0.0273 (0)	0.0259 (0)	0.0252 (0)	No
1-Hour	0.18 ppm [a]	0.06 (0)	0.08 (0)	0.09 (0)	No
Sulfur Dioxide (SO_2)					
1-Hour	0.030 ppm [b]	0.006 (0)	0.010 (0)	0.0019 (0)	No
24-Hour	0.04 ppm [a]	0.01 (0)	0.004 (0)	0.003 (0)	No
Suspended Particulate Matter (PM_{10})					
Mean	20 µg/m^3 [a]	47.7	42.3	53.5	Yes
24-Hour	50 µg/m^3 [a]	106 (29)	72 (0)	142	Yes
Fine Suspended Particulate Matter ($PM_{2.5}$)					
Mean	12 µg/m^3 [a]	20.0	18.9	17.8	Yes
24 Hours	35 µg/m^3 [b]	71.4 (1)	48.2 (0)	55.0 (0)	No

Abbrev: ppm: parts per million; µg/m^3: micrograms per cubic meter; ND: No Data; Mean: Annual Arithmetic Mean; a California state standard used; b Federal standard used
Notes: Data for all criteria pollutants from SRA34 monitoring stations [Central San Bernardino Valley 1 or 2]
Source: MBA 2007.

Attainment Status

Airsheds where ambient air quality standards are exceeded are called "nonattainment" areas. If standards are met, they are designated as "attainment" areas. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." National "non-attainment" areas are considered extreme, serious, or moderate as a function of deviation from standards. The Basin is currently in non-attainment for ozone, PM_{10}, and $PM_{2.5}$ based on state and federal standards (Table 3, MBA 2007).

Regulatory Authority

The air pollution control agency for the Basin is the SCAQMD. The SCAQMD is responsible for controlling emissions primarily from stationary sources. The SCAQMD in coordination with the SCAG developed the Air Quality Management Plan (AQMP) to set forth a comprehensive program that will lead the Basin into compliance with all national and state ambient air quality standards. The SCAQMD also maintains air quality monitoring stations throughout the basin and publishes air quality attainment information based on the national and State ambient (outdoor) ambient air quality standards.

The California Department of Public Health had implemented California ambient air quality standards (CAAQS) for particulates and carbon monoxide (CO) in 1959. The CARB was created in 1967 and set CAAQS for particulates, carbon monoxide, and nitrogen dioxide.

The U.S. Environmental Protection Agency (EPA) was created in 1970 to protect all aspects of the environment. National ambient air quality standards (NAAQS) were established by the U.S. EPA in 1971 for six target pollutants: particulates, photochemcial oxidants (including ozone), hydrocarbons, carbon monoxide, nitrogen dioxide, and sulfur dioxide. The NAAQS and California Clean Air Act (CAAQS) established the context for local air quality management plans in 1977 with the Federal Clean Air Act (1977 Amendments). Agencies in any area of the nation not meeting NAAQS must prepare a plan demonstrating the steps that would bring the area into compliance with all national standards by December 31, 1987. In 1977, the Basin could not meet the deadline for ozone, nitrogen dioxide, carbon monoxide, or PM_{10}. The SCAQMD and SCAG first adopted an AQMP in 1979 and revised it in 1982 for attainment of the standards in 2000. Subsequent amendments to clean air compliance regulations extended the attainment deadline to 2010 for extreme non-attainment airsheds such as Basin.

The current AQMP for the Basin is the 2007 AQMP, which was adopted by the SCAQMD on June 1, 2007. On July 13, 2007, the SCAQMD Board adopted 2007 Final AQMP Transportation Conformity Budgets and directed the Executive Officer to forward them to CARB for its approval and subsequent submittal to the U.S. EPA. On September 27, 2007, CARB adopted the State Strategy for the 2007 State Implementation Plan (SIP) and the 2007 AQMP as part of the SIP.

The 2007 AQMP incorporates significant new emissions inventories, ambient measurements, scientific data, control strategies, and air quality modeling. The 2007 AQMP outlines a detailed strategy for meeting the federal health-based standards for $PM_{2.5}$ by 2015 and 8-hour ozone by 2024 while accounting for and accommodating future expected growth. Most of the reductions will be from mobile sources, which is currently responsible for about 75 percent of all smog and particulate forming emissions. The 2007 AQMP includes 37 control measures proposed for adoption by the SCAQMD, including measures to reduce emissions from new commercial and residential developments, more reductions from industrial facilities, and reductions from wood-burning fireplaces and restaurant charbroilers.

Relative to greenhouse gas (GHG) emissions and global climate change, the State Legislature approved AB 32 in 2007 which seeks to reduce GHG emissions to 1990 levels by 2020. This same level of GHG reduction is encouraged through Executive Order S-3-05 by California Governor Arnold Schwarzenegger. In addition, the State Legislature passed SB 97 in 2008 which establishes a target of 2009 for the Office of Planning and Research to identify how CEQA documents will deal with GHG emissions and global climate change.

Analysis Methodology

MBA prepared a stand-alone air quality analysis of the Proposed Project in 2007. The air quality analysis was prepared using the SCAQMD CEQA Guidelines and supplemented with information included in the Traffic Impact Analysis prepared for the Proposed Project by Kunzman Associates (see Section 4.12, *Transportation*). Data from the Traffic Impact Analysis included LOS calculations, average daily vehicle trips, and turning movements at intersections. This information was used to determine the operational vehicular emissions of the Proposed Project and was used for the CO hotspot analysis. Daily increases in vehicular and area emissions associated with the Proposed Project were estimated using the CARB-approved URBEMIS 2007 (Version 9.2.2) computer program based on default assumptions contained in the model. Constriction emissions were also modeled using URBEMIS 2007 (Version 9.2.2). The CO hot spot analysis was prepared in accordance with the University of California, Davis Institute of Transportation Studies document, Transportation Project-Level Carbon Monoxide Protocol.

4.2.3 - Thresholds of Significance

According to the CEQA Guidelines' Appendix G, Environmental Checklist, to determine whether impacts to air quality are significant environmental effects, the following questions are analyzed and evaluated:

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

d.) Expose sensitive receptors to substantial pollutant concentrations?

e.) Create objectionable odors affecting a substantial number of people?

SCAQMD Thresholds

The following significance thresholds have been established by SCAQMD. Projects in the Basin region with construction-related emissions any of these thresholds should be considered significant:

Pollutant	Construction (pounds per day)	Operation (pounds per day)
Oxides of Nitrogen (NO_x)	100	55
Volatile Organic Compounds (VOC)	75	55
Particulate Matter (PM_{10})	150	150
Particulate Matter ($PM_{2.5}$)	55	55
Oxides of Sulfur (SO_x)	150	150
Carbon Monoxide (CO)	550	550
Source: South Coast Air Quality Management District, 2006.		

Project emissions may also be considered significant if a CO hotspot analysis determines that project-generated emissions cause a localized violation of the state CO 1-hour standard of 20 parts per million (ppm), state CO 8-hour standard of 9 ppm, federal CO 1-hour standard of 35 ppm, or federal CO 8 hour standard of 9.5 ppm.

SCAQMD Rules

SCAQMD Rule 403 governs the emission of fugitive dust. Compliance with this rule is achieved through application of standard best management practices in construction and operation activities, such as application of water or chemical stabilizers to disturbed soils, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 mph, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph and establishing permanent, stabilizing ground cover on finished sites. Rule 403 also requires projects that disturb over 100 acres of soil or moves 10,000 cubic yards per day of materials to submit to the SCAQMD a Fugitive Dust Control Plan.

SCAQMD Rule 1108 governs the sale, use, and manufacturing of asphalt and limits the VOC content in asphalt in the South Coast Air Basin. Although this rule does not directly apply to the project, it does dictate the VOC content in asphalt available during construction.

SCAQMD Rule 1113 governs the sale, use, and manufacturing of architectural coatings and limits the VOC content in paints and paint solvents. Although this rule does not directly apply to the project, it does dictate the VOC content of paints available for use during the construction of the buildings.

4.2.4 - Project Impacts and Mitigation Measures

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

Construction Emissions

Impact AIR-1: The Proposed Project would result in substantial emissions of criteria pollutants during construction.

Impact Analysis

Short-term impacts will include fugitive dust and other particulate matter, as well as exhaust emissions generated by earthmoving activities and operation of grading equipment during site preparation. Construction emissions are caused by onsite or offsite activities. Onsite emissions principally consist of exhaust emissions (NO_X, SO_X, CO, VOC, PM_{10}, and $PM_{2.5}$) from heavy-duty construction equipment, motor vehicle operation, and fugitive dust (mainly PM_{10}) from disturbed soil. Offsite emissions are caused by motor vehicle exhaust from delivery vehicles, as well as worker traffic, but also include road dust (PM_{10}). Major construction-related activities include the following:

- Grading/clearing, including the excavation;
- Excavation and earthmoving for infrastructure construction of the utilities, both on- and offsite, and dwelling unit foundations and footings;
- Building construction;
- Asphalt paving of access roads throughout the development; and
- Application of architectural coatings for things such as dwelling stucco and interior painting.

Construction equipment such as scrapers, bulldozers, forklifts, backhoes, water trucks, and industrial saws are expected to be used on the project site and will result in exhaust emissions. During the finishing phase, paving operations and application of architectural coatings will release VOC emissions. Construction emission can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions.

No information was available about the Proposed Project**'**s construction fleet at the time of this writing, so default fleet assumptions from the URBEMIS program were used to estimate "worst case" emissions, which is included in Appendix B and summarized below:

Mass Grading	**Trenching**	**Paving**
1 – Excavator	2 – Excavators	1 - Paver
1 – Grader	1 – Other General	2 – Paving Equip.
2 – Rubber-Tired Dozers	1 – Tractor/Loader/Backhoe	2 - Rollers
3 – Scrapers		
3 – Tractor/Loader/Backhoe		
1 – Water Truck		

Building Construction

1 - Crane

3 – Forklifts

3 – Generator Sets

3 - Welders

A construction emission analysis was performed using the URBEMIS 2007 emissions inventory model. Construction activities include site grading (both mass and fine) assuming a maximum of 50 acres graded or disturbed per day, building and infrastructure construction, and asphalt paving, using the default URBEMIS equipment list shown above. Unmitigated estimated short-term emissions from these phases are shown in Table 4.2-3.

Table 4.2-3: Estimated Short-Term Emissions (Unmitigated)

Phase	Emissions (pounds per day)						
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Mass Grading	14	117	61	0	1,006	214	10,431
Fine Grading, Trenching	8	62	33	0	403	87	5,662
Asphalt Paving and Building	20	98	150	<1	7	6	20,521
Building	13	63	125	<1	4	3	17,592
Building and Coating	44	63	127	<1	5	4	17,770
Maximum "Worst Case" Daily Emissions*	**44**	**117**	**150**	**<1**	**1,006**	**214**	**20,521**
Significance Threshold	75	100	550	150	150	55	None
Significant Impact?	No	**Yes**	No	No	**Yes**	**Yes**	**

Notes:
* The maximum daily emissions refer to the maximum emissions that would occur in any one day; it was assumed that the grading activities do not occur at the same time as the other construction activities; therefore, their emissions are not added together.
** No SCAQMD thresholds established yet - see analysis in AIR-9 under Climate Change
VOC = volatile organic compounds NOx = nitrous oxides CO = carbon monoxide
SO_x = sulfur oxides PM_{10} and $PM_{2.5}$ = particulate matter CO_2 = carbon dioxide
Source: MBA 2007.

When emissions projections for project construction are compared with the SCAQMD thresholds for significance, it is shown that emissions exceed the applicable thresholds for NOx, $PM_{2.5}$, and PM_{10}. The primary source of NOx is from the exhaust from the grading equipment. The primary source of PM_{10} and $PM_{2.5}$ is fugitive dust from the grading and earth-disturbing activities. Note that emissions of carbon dioxide, a greenhouse gas, are addressed in Section AIR-9 under Climate Change.

Local Significance Thresholds

The evaluation of localized impacts determines the potential of the Proposed Project to violate any air quality standard, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. To evaluate localized impacts for construction and operational emissions, an air dispersion model is used to simulate the movement of project related pollutants through the air and compare the concentration of those pollutants to the applicable thresholds. The derivation of the thresholds is discussed in the air quality report (MBA 2007).

As discussed previously, unmitigated construction emissions of NOx, $PM_{2.5}$, and PM_{10} are significant on a regional basis. The unmitigated emissions as calculated for the regional analysis by URBEMIS were used in the dispersion model to predict how the pollutants would move through the atmosphere. The maximum amount of acreage that would be disturbed per day is approximately 50 acres. The nearest sensitive receptor is located approximately 200 meters southeast of the project boundary (existing residential neighborhood along North I Street).

Table 4.2-4 indicates that the emissions produced during grading are the greatest during the construction period. Therefore, grading emissions were used in the analysis. The dispersion modeling results at the maximum receptor locations are presented in Table 4.2-5. As shown in the table, unmitigated concentrations of PM_{10}, $PM_{2.5}$, nitrogen dioxide, or CO do not exceed the localized significance thresholds.

Table 4.2-4: Localized Analysis - Construction

Location	24-hour PM_{10} ($\mu g/m^3$)	24-hour $PM_{2.5}$ ($\mu g/m^3$)	1-hour NO_2 (ppm)	1-hour CO (ppm)	8-hour CO (ppm)
Maximum - fenceline	430	91	0.004	0.2	0.1
Sensitive receptor - residences	4	<1	0.004	0.1	0.1
Localized Significance Threshold	10.4	10.4	0.09	17	6.7
Exceed Localized Threshold at Residences?	No	No	No	No	No
Source: MBA 2007					

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM AIR-1a Prior to construction of the proposed improvements, the project proponent will provide a Fugitive Dust Control Plan (FDCP) that will describe the application of standard best management practices to control dust during construction. Best management practices will include:

- Application of water on disturbed soils a minimum of two times per day;
- Using track-out prevention devices at construction site access points;
- Stabilizing construction area exit points;
- Limiting onsite construction traffic to 15 miles per hour on unpaved roads;
- Limiting onsite construction traffic to 25 miles per hour on paved roads;
- Paving or providing a hard surface for onsite roads to reduce fugitive dust;
- Covering dirt haul vehicles; and
- Replanting disturbed areas as soon as practical and other measures, as deemed appropriate to the site, to control fugitive dust.

The Fugitive Dust Control Plan shall be submitted to the City for review and approval prior to grading.

MM AIR-1b Prior to construction of the proposed improvements, a Construction Traffic Control Plan (CTCP) will be reviewed and approved by the City. The CTCP will describe in detail safe detours around the project construction site and provide temporary traffic control (i.e., flag person) during construction related truck hauling activities.

MM AIR-1c During construction of the proposed improvements, construction equipment shall be properly maintained at an offsite location, including proper tuning and timing of engines. Equipment maintenance records and equipment design specification data sheets shall be kept on-site during construction.

MM AIR-1d During construction of the proposed improvements, all contractors will be advised not to idle construction equipment on the site for more than five minutes.

MM AIR-1e During construction of the proposed improvements, onsite electrical hook ups shall be provided for electric construction tools including saws, drills and compressors, to eliminate the need for diesel powered electric generators.

MM AIR-1f Onsite grading equipment will comply with one or more of the following:

- Use of onsite grading and construction equipment equipped with oxidized diesel catalyst and fueled with aqueous diesel fuel during grading and construction operations with a reduced equipment fleet or hours of operation totaling a maximum of 17,000 horsepower hours per day;
- Use of onsite grading and construction equipment equipped with oxidized diesel catalyst with a reduced equipment fleet or hours of operation totaling a maximum of 14,000 horsepower hours per day;

- Use of onsite grading and construction equipment fueled with aqueous diesel fuel during grading and construction operations with a reduced equipment fleet or hours of operation totaling a maximum of 13,000 horsepower hours per day; and
- Reduce the grading and construction equipment fleet or hours of operation to a maximum total of 10,000 horsepower hours per day.

MM AIR-1g Implementation of the Short-Term Air Quality Mitigation Measures shall be documented in an Air Quality Mitigation Implementation Plan. This plan will detail each mitigation measure and include daily logs documenting implementation of each mitigation measure. Daily logs for each piece of construction equipment will include the hours per day the equipment ran. A master daily log will document the hours of operation all equipment ran each day. The master daily log will also document timing and tuning of equipment, the type of fuel used on construction equipment, and any add-on emissions reduction equipment used such as oxidized diesel catalysts.

Level of Significance After Mitigation

Significant unavoidable impact from PM_{10} emissions as shown in Table 4.2-5.

In an effort to reduce estimated NOx and PM_{10} emissions, a range of control measures were considered. Effective emission reduction measures to reduce exhaust emissions by 5 percent include providing temporary traffic control (e.g., flag person) during transport activities, properly maintaining construction equipment, and prohibiting truck and equipment idling in excess of 5 minutes. A fifteen percent reduction of NOx would be afforded by requiring all onsite grading equipment to be equipped with a combination of low emissions fuel, add-on emissions reduction equipment, and/or reduced hours of operation. The most effective way to reduce PM_{10} and associated $PM_{2.5}$ emissions is to reduce dust generation and transport during grading.

Table 4.2-5 shows the estimated total mitigated short-term emissions. Based on this analysis, PM_{10} emissions exceed the applicable SCAQMD significance thresholds after mitigation. Short-term air quality impacts are therefore significant even with mitigation incorporated into the Proposed Project.

Table 4.2-5: Mitigated Short-Term Emissions

Phase	Emissions (pounds per day)						
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Mass Grading	14	100	61	0	169	40	10,431
Fine Grading, Trenching	8	62	33	0	403	87	5,662
Asphalt Paving and Building	20	98	150	<1	7	6	20,521
Building	13	63	125	<1	4	3	17,592
Building and Coating	44	63	127	<1	5	4	17,770

Table 4.2 5: Mitigated Short-Term Emissions (Cont.)

Phase	Emissions (pounds per day)						
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2
5% Reduction from Additional Mitigation		-5					
Maximum "Worst Case" Daily Emissions*	**44**	**95**	**150**	**<1**	**169**	**40**	**20,521**
Significance Threshold	75	100	550	150	150	55	None
Significant Impact?	No	No	No	No	**Yes**	No	**

Notes:
* The maximum daily emissions refer to the maximum emissions that would occur in one day; it was assumed that the grading activities do not occur at the same time as the other construction activities; therefore, their emissions are not added together.
** No SCAQMD thresholds established yet - see analysis in AIR-9 under Climate Change
VOC = volatile organic compounds NOx = nitrous oxides CO = carbon monoxide
SO_x = sulfur oxides PM_{10} and $PM_{2.5}$ = particulate matter CO_2 = carbon dioxide
Source: MBA 2007.

Construction Emissions - Toxic Air Contaminants

Impact AIR-2: Construction activities would not expose construction workers or the public to substantial amounts of toxic air pollutants.

Impact Analysis

There are no indications that the site contains hazardous materials or surface or subsurface soils containing hazardous materials that could generate toxic air contaminants (TACs). This conclusion is supported by the data and analysis in Section 4.6, *Hazards and Hazardous Materials*, as well as soil data from the extensive seismic excavations conducted onsite outlined in Section 4.5, *Geology, Soils, and Seismicity*.

The construction equipment would emit diesel particulate matter, which is a carcinogen. However, the diesel particulate matter emissions are short term in nature. Determination of risk from diesel particulate matter is considered over a 70-year exposure time. Additionally, the nearest sensitive receptors (residences) would be located approximately 200 meters from the project site, as outlined in the related analysis of Local Significance Thresholds in section AIR-1. Considering the dispersion of the emissions and the short time frame, exposure of local residents to diesel particulate matter from construction is anticipated to be less than significant. Therefore, TAC emissions would not be substantial enough to be considered a significant health risk.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Operational Emissions

Impact AIR-3: The Proposed Project would result in substantial emissions of criteria pollutants during operations.

Impact Analysis

Operational emission sources consist of mobile emissions and area source emissions. Mobile source emissions estimates are derived from motor vehicle traffic. Area source emissions estimates are derived from the consumption of natural gas, electricity, and consumer products, as well as emissions resulting from landscape maintenance. An estimate of the daily operational emissions is derived by combining both mobile and area source emissions.

Regional Impacts

Long-term or operational impacts will occur once the Proposed Project is in operation. These consist of air emissions from mobile vehicles, and area source emissions. Area emissions include emissions from natural gas, consumer products, and paint applications associated with maintenance activities. In addition, there are landscaping emissions during the summer and during the winter, there is the potential for fireplace/hearth emissions. However, a project design feature includes only natural gas fireplaces instead of allowing wood burning fireplaces. Mobile and area source emissions were estimated using URBEMIS2007 (version 9.2.2). The mobile and area emissions are displayed in Table 4.2-6 and indicate that long-term emissions of VOC, NOx, and CO exceed the applicable SCAQMD thresholds of significance. Mitigation is, therefore, needed to reduce these emissions.

Table 4.2-6: Estimated Long-Term Emissions (Unmitigated, Winter)

Source	Emissions (pounds per day)						
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Mobile vehicles	54	79	579	<1	107	21	58,228
Area source	53	16	7	<1	<1	<1	20,447
Total	107	95	586	0	107	21	78,675
Significance Threshold	55	55	550	150	150	55	None
Significant Impact?	**Yes**	**Yes**	**Yes**	No	No	No	--

VOC = volatile organic compounds
NOx = nitrous oxides
CO = carbon monoxide
SO_x = sulfur oxides
PM_{10} and $PM_{2.5}$ = particulate matter
CO_2 = carbon dioxide
Source: MBA 2007

Transit Services

CSUSB staff indicated it will provide a shuttle for students to travel to and from the campus without driving, thereby reducing traffic and parking impacts during school hours. They also indicated that students will be able to ride the shuttle free if they have paid for a parking sticker. In addition,

non-students will be able to use the shuttle by paying a per ride fee or fare. This shuttle system will, therefore, provide access for project residents to transit connections at the CSUSB campus. The Specific Plan provides the installation of appropriate transit "infrastructure" (i.e., bus turnouts, bus shelters/benches, street lighting, and safe ingress/egress between the designated bus stop and adjacent uses).

During the second scoping meeting, a representative of Omnitrans provided information regarding their "sbX" project, which will provide express transit across town connecting San Bernardino, Loma Linda, etc. with a connection to the CSUSB campus. The project is scheduled to begin in 2011 so UHSP project residents will eventually have access to several forms of transit which will help reduce individual vehicle trips and related air pollutant emissions in the future.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM AIR-3a The project proponent shall install bicycle racks at the clubhouse, MDA and A (attached) housing areas (Planning Areas 6, 8-11, 13, 14, 16, 18, and 20), and all park sites to encourage non-vehicular trips within the project.

MM AIR-3b The project design shall include signs posted in visible places in any truck parking areas that state, "No Idling."

MM AIR-3c The project proponent will coordinate with CSUSB to install improvements that will support future shuttle transit service for project residents, including bus turnouts, bus shelters/benches, street lighting, and safe ingress/egress between the designated bus stop and adjacent uses. The developer will install identified improvements when the applicable road is constructed. .

MM AIR-3d Provide onsite information for clubhouse employees regarding local car pools, bus schedules and shuttle services in the area that service the project site, including maps showing the routes of transit services and employee carpool destinations.

Level of Significance After Mitigation

Significant unavoidable impact.

There are limited long-term mitigations for reducing emissions on residential projects, since there is little or no control that can be exercised over individual resident trips. The Proposed Project will eventually have local bus service available; however, the initial start date for the bus shuttle service may be after the completion of the Proposed Project. Eventually, these measures will help reduce mobile emissions from project residents by approximately 5 percent. While this analysis represents "worst case" conditions, it is reasonable to conclude that long-term project emissions of VOC, NOx,

and CO will still continue to exceed SCAQMD thresholds even after transit service is available to the project site, as shown in Table 4.2-7.

Table 4.2-7: Mitigated Long-Term Emissions

Source	Emissions (pounds per day)						
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Mobile vehicles	54	79	579	<1	107	21	58228
Mitigation and project design features (5% reduction)	*-3*	*-4*	*-29*	*0*	*-5*	*-1*	*-2911*
Area source	53	16	7	<1	<1	<1	20447
Mitigated Total	**104**	**91**	**557**	**0**	**102**	**20**	**75764**
Significance Threshold	55	55	550	150	150	55	None
Significant Impact?	**Yes**	**Yes**	**Yes**	No	No	No	-

VOC = volatile organic compounds
NOx = nitrous oxides
CO = carbon monoxide
SO_x = sulfur oxides
PM_{10} and $PM_{2.5}$ = particulate matter
CO_2 = carbon dioxide
Source: MBA 2007

Carbon Monoxide Hot Spots

Impact AIR-4: **The Proposed Project would not create carbon monoxide hot spots that would exceed federal or State concentration standards.**

Impact Analysis

Carbon monoxide from mobile sources is the main pollutant of local concern and correlates to traffic volume, speed, and delay. Carbon monoxide emissions disperse quickly under normal meteorological conditions but can reach unhealthy levels with more stagnant meteorological conditions. High concentrations of CO are often found near signalized intersections or roadway segments operating at poor levels of service (LOS E or worse) during peak-hour traffic.

The significance of project-related CO impacts is generally based on guidance presented in the CO Protocol prepared by the University of California, Davis, Institute of Transportation Studies. This document presents a series of criteria that are used to determine the significance of impacts. According to the CO Protocol, intersections with LOS E or F require detailed analysis. In addition, intersections that operate under LOS D conditions in areas that experience meteorological conditions favorable to CO accumulation require a detailed analysis.

The results from this screening procedure are presented in Table 4.2-8. As shown in the table, the estimated CO concentrations are below the state and federal standards. Therefore, impacts related to CO hotspots are less than significant.

Table 4.2-8: Estimated Carbon Monoxide Concentrations

Intersection	1 Hour Estimated CO Concentration (ppm)	8 Hour Estimated CO Concentration (ppm)	Significant Impact?
Palm Avenue at Kendall Drive	4.1	3.1	No
University Parkway at Northpark Blvd.	4.4	3.3	No
University Parkway at Kendall Drive	4.8	3.6	No
University Parkway at I-215 NB Ramps	5.4	4.0	No
Little Mountain Dr. at Northpark Blvd.	3.6	2.7	No
Source: MBA 2007			

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Cumulative Air Quality Impacts

Impact AIR-5: **Because operational emissions would exceed regional thresholds, the Proposed Project would have a significant cumulative impact on air quality.**

Impact Analysis

According to the checklist in the CEQA Guidelines, a Proposed Project would create a significant impact if it would "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)."

In accordance with CEQA Guidelines 15130(b), this analysis of cumulative impacts incorporates a summary of projections. The following tiered approach is to assess cumulative air quality impacts.

1. Consistency with the regional thresholds for non-attainment pollutants;
2. Project consistency with existing air quality plans; and
3. Assessment of the cumulative health effects of the pollutants.

Regional Analysis

If an area is in nonattainment for a criteria pollutant, then the background concentration of that pollutant has historically been over the ambient air quality standard. It follows that if a project exceeds the regional threshold for that non-attainment pollutant, then it would result in a cumulatively considerable net increase of that pollutant and result in a significant cumulative impact.

The South Coast Air Basin is in non-attainment for PM_{10}, $PM_{2.5}$, and ozone, and the project exceeds the regional thresholds for PM_{10} or $PM_{2.5}$, therefore it contributes to a cumulatively considerable impact for those pollutants. Additionally, the project exceeds the regional threshold for NOx or VOC, so it would contribute to a cumulatively considerable impact for ozone.

The regional significance analysis of construction emissions demonstrated that without mitigation, emissions of NOx would be over the SCAQMD regional significance threshold. NOx is a precursor pollutant. Therefore, according to this criterion, the project results in a significant cumulative impact. Additionally during construction, emissions of PM_{10} and $PM_{2.5}$ are over the regional significance threshold prior to mitigation.

The regional significance analysis of operational impacts indicates that without mitigation, VOC, NOx, and CO emissions violate the SCAQMD regional significance thresholds. VOC and NOx are ozone precursors, so the project could cumulatively contribute to an ozone violation. Therefore, according to this criterion, the project results in a significant cumulative impact.

In summary, without mitigation, the project contributes a cumulatively significant regional impact to pollutants PM_{10}, $PM_{2.5}$, and ozone.

Plan Approach

The geographic scope for cumulative air quality impacts is the South Coast Air Basin because that is the area in which the air pollutants generated by the sources within the basin circulate and are often trapped. The SCAQMD is required to prepare and maintain an AQMP and a State Implementation Plan to document the strategies and measures to be undertaken to reach attainment of ambient air quality standards. While the SCAQMD does not have direct authority over land use decisions, it was recognized that changes in land use and circulation planning were necessary to maintain clean air. The SCAQMD evaluated the entire basin when it developed the AQMP.

According to the analysis contained in Section 6.1, the project is not consistent with the most recent AQMP without mitigation; therefore, according to this criterion, the project presents a significant impact.

Cumulative Health Impacts

The basin is in non-attainment for ozone, PM_{10}, and $PM_{2.5}$, which means that the background levels of those pollutants are at times higher than the ambient air quality standards. The air quality standards were set to protect public health, including the health of sensitive individuals (i.e., elderly, children, and the sick). Therefore, when the concentration of those pollutants exceeds the standard, it is likely that some sensitive individuals in the population experience health effects as described above in the sub-section, Air Pollutants. However, the health effects are a factor of the dose-response curve. Concentration of the pollutant in the air (dose), the length of time exposed, and the response of the individual are factors involved in severity and nature of health impacts. If a significant health impact results from project emissions, it does not mean that 100 percent of the population would experience health effects.

The regional analysis of construction emissions indicates that without mitigation, the project would exceed the SCAQMD regional significance thresholds for NOx (ozone precursor). In addition, long-term operational emissions of VOC and NOx are over the District's significance thresholds. VOC and NOx are precursor to ozone. Because ozone is a secondary pollutant (it is not emitted directly but formed by chemical reactions in the air), it can be formed miles downwind of the project site. Project emissions of VOC and NOx may contribute to the background concentration of ozone and cumulatively cause health effects. Health impacts may or may not include the following: (a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans. Short-term exposure can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes (SCAQMD AQMP 2003). Children who live in high ozone communities and who participate in multiple sports have been observed to have a higher asthma risk. This is a significant cumulative health impact associated with ground-level ozone concentrations.

During construction, emissions of PM_{10} and $PM_{2.5}$ are over the regional significance thresholds, which could contribute to a cumulative effect. The health effects from exposure to particulate matter may include the following: (a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and (c) Increased risk of premature death from heart or lung diseases in the elderly.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Refer to Mitigation Measures AIR-1 and AIR-3.

Level of Significance After Mitigation

Significant unavoidable impact.

With mitigation, NOx emissions during construction are reduced to below the level of significance. However, emissions of NOx and VOC during operation remain above the significance thresholds; therefore, the project could contribute to a cumulative impact from ozone exposure and may cause health effects associated with ozone exposure. With mitigation, emissions of PM_{10} remain above the regional significance thresholds; therefore, the project could contribute to a cumulative impact from PM_{10} exposure and may cause health effects associated with PM_{10} exposure.

Air Quality Management Plan Consistency

Impact AIR-6: The Proposed Project would be inconsistent with the projections contained in the SCAQMD Air Quality Management Plan (AQMP).

Impact Analysis

The CEQA Guidelines indicate that a significant impact would occur if the Proposed Project would conflict with or obstruct implementation of the applicable air quality plan. This assessment will use the following criteria for determining project consistency with the current AQMP.

Project's Contribution to Air Quality Violations

According to the SCAQMD (1993), the project is consistent with the AQMP if the project will not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP (SCAQMD 1993, Page 12-3). As shown in the previous discussions in this section, the project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. Therefore, the project meets the first indicator.

Control Measures

The next criterion is compliance with the control measures in the 2003 AQMP and the 2007 AQMP. The 2007 AQMP has been adopted by the SCAQMD and CARB, but has not been adopted by the U.S. EPA. Therefore, the two plans are discussed herein.

The 2003 AQMP contains a number of land use and transportation control measures including the following: the District's Stationary and Mobile Source Control Measures; State Control Measures proposed by CARB; and Transportation Control Measures provided by SCAG (AQMP 2003, Page 4-3). CARB's strategy for reducing mobile source emissions include the following approaches: new engine standards; reduce emissions from in-use fleet, require clean fuels, support alternative fuels and reduce petroleum dependency, work with EPA to reduce emissions from national and state sources, and pursue long-term advanced technology measures (AQMP 2003, Page 4-25). Transportation control measures provided by SCAG include those contained in the Regional Transportation Plans (RTP), the most current version being the 2004 RTP (SCAG 2004). The RTP has control measures to reduce emissions from on-road sources by incorporating strategies such as high occupancy vehicle interventions, transit, and information-based technology interventions (AQMP 2003, Page 4-19). The measures implemented by CARB and SCAG affect the project indirectly by regulating the vehicles that the residents may use and regulating public transportation. The project indirectly will comply with the control measures set by CARB and SCAG.

The 2007 AQMP aims to attain the federal $PM_{2.5}$ and 8-hour ozone standards by 2015 and 2024, respectively. This is done by building upon improvements from the previous plans and incorporating all feasible control measures while balancing costs and socioeconomic impacts. The 2007 AQMP indicates that $PM_{2.5}$ is formed primarily secondarily. Therefore, instead of reducing fugitive dust, the

strategy for reducing $PM_{2.5}$ focuses on reducing precursor emissions of SOx, directly emitted $PM_{2.5}$, NOx, and VOC. The Final 2007 AQMP control measures consist of four components: 1) the SCAQMD's Stationary and Mobile Source Control Measures; 2) CARB's Proposed State Strategy; 3) SCAQMD Staff's Proposed Policy Options to Supplement CARB's Control Strategy; and 4) Regional Transportation Strategy and Control Measures provided by SCAG.

The project will comply with all of the SCAQMD's applicable rules and regulations. Therefore, the project complies with this criterion.

Compliance with the SCAQMD Regional Thresholds

Although there is no known guidance that correlates AQMP consistency with the SCAQMD regional thresholds, it is common to use the thresholds in assessing AQMP compliance. The regional significance analysis of construction emissions demonstrated that without mitigation, emissions of PM_{10} would be over the SCAQMD regional significance threshold. The regional significance analysis of operational impacts indicates that without mitigation, the project would violate the SCAQMD regional significance thresholds for VOC, NOx, and CO. Therefore, without mitigation, the project is not consistent with the SCAQMD regional thresholds.

Vehicle Miles Traveled

Determining project conformity to the air plans involves ensuring that the population density or employment characteristics, and land use of the project are consistent with the are growth assumptions used in the air plans for the air basin. According to the CARB's transportation performance standards, the rate of growth in vehicle miles traveled (VMT) and trips should be held to the rate of population growth. Compliance with this performance standard is one way suggested by CARB of showing compliance with the growth assumptions used in the AQMP. If the total VMT generated by the Proposed Project at build-out is at or below that predicted by the AQMP, then the Proposed Project's mobile emissions is consistent with the AQMP. It is assumed that the existing and future pollutant emissions computed in the AQMP was based on land uses from area general plans. The Proposed Project's land use designation and density are compared to those in the San Bernardino General Plan. The land use designation in the General Plan for the project site is Specific Plan but the approved plan includes only 504 residential units. Although the land use designation in the General Plan is the same as the Proposed Project, the expected vehicle trips and vehicle miles traveled of the UHSP would be higher than those expected under the PHSP.

Level of Significance Before Mitigation

Potentially significant impact.

The Proposed Project will be compliant with all applicable rules and regulations in the 2003 and 2007 AQMPs. However, the project exceeds SCAQMD regional significance thresholds. Additionally, the vehicle miles traveled for the Proposed Project would be greater than those anticipated in the PHSP. Therefore, the project results in a potentially significant impact.

Mitigation Measures

No mitigation is available.

Level of Significance After Mitigation

Given that no feasible mitigation is available, the project may exceed select SCAQMD regional thresholds.

Sensitive Receptors

Impact AIR-7:	**The Proposed Project would not expose sensitive receptors to substantial pollutant concentrations.**

Impact Analysis

The sensitive receptors of most concern as they relate to the Proposed Project are the existing residents in the neighborhood along North I Street north of Northpark Boulevard. At a minimum, this area is 600 feet south of the eastern end of the project site (Planning Areas 19 and 20).

As discussed in Impact AIR-2, project construction activities would be of temporary duration and would not have the potential to expose sensitive receptors to substantial concentrations of TACs. Operational activities associated with the Proposed Project would result in regular truck deliveries by diesel-powered tractor-trailers. None of the proposed uses onsite would receive regular deliveries or pick-ups from trucks. Infrequent deliveries to the clubhouse might occur at different times during the day and would not be expected to occur more than 5 times in a given day. In addition, State law prohibits the idling of diesel trucks for more than 5 minutes in loading areas. Because of the infrequent number and distribution of deliveries throughout a given day, the distance between the clubhouse and the nearest school-related receptor or existing residential receptor, and the prohibition on extended idling, hazardous operational emissions of diesel particulate matter would not expose sensitive receptors. Impacts would be less than significant.

The localized construction analysis demonstrated that without mitigation, the project would not exceed the localized thresholds for CO, nitrogen dioxide, PM_{10}, or $PM_{2.5}$. Therefore, during grading and construction, the project would not expose sensitive receptors to substantial pollutant concentrations of CO, nitrogen dioxide, PM_{10}, or $PM_{2.5}$.

A CO hotspot analysis is the appropriate tool to determine if project emissions of CO during operation would exceed ambient air quality standards. The main source of air pollutant emissions during operation is from offsite motor vehicles traveling on the roads surrounding the project. The CO hotspot analysis demonstrated that emissions of CO during operation would not result in an exceedance of the most stringent ambient air quality standards for CO. Therefore, according to this criterion, air pollutant emissions during operation would result in a less than significant impact.

The CARB Air Quality and Land Use Handbook contains recommendations that will "help keep California's children and other vulnerable populations out of harm's way with respect to nearby sources of air pollution" (CARB 2005), including recommendations for distances between sensitive

receptors and certain land uses. CARB recommends avoiding new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day. Epidemiological studies indicate that the distance from the roadway and truck traffic densities were key factors in the correlation of health effects, particularly in children. Roads adjacent to the Proposed Project assessed in the traffic study do not exceed a volume of 50,000 vehicles per day; therefore, the project complies with this recommendation.

CARB recommends avoiding new sensitive land uses within 300 feet of a large fueling station (a facility with a throughput of 3.6 million gallons per year or greater). A 50-foot separation is recommended for typical gas dispensing facilities. The project is not within 300 feet of a fueling station; therefore, the project complies with this recommendation.

CARB recommends avoiding siting new sensitive land uses within 300 feet of any dry cleaning operation that uses perchloroethylene. For operations with two or more machines, CARB recommends a buffer of 500 feet. For operations with three or more machines, CARB recommends consultation with the local air district. The project is not near a dry cleaning operation, but may have a dry cleaning facility within the clubhouse as a resident service. If it does, the project will most likely not use perchloroethylene or it will comply with CARB guidelines for the use of this chemical.

In summary, the project would not expose sensitive receptors to substantial criteria pollutant concentrations during operation of the Proposed Project.

Level of Significance Before Mitigation
Less than significant impact.

Mitigation Measures
No mitigation is necessary.

Level of Significance After Mitigation
Less than significant impact.

Objectionable Odors

Impact AIR-8:	**The Proposed Project would not generate objectionable odors that would affect a substantial number of people.**

Impact Analysis
The Proposed Project would develop 980 residential units, several parks, and a clubhouse on 170 acres in a currently vacant area. None of these uses would generate substantial odors (e.g., agriculture). Odors may be apparent in and around dumpsters and other refuse collection facilities; however, these facilities would be located away from publicly accessible areas (e.g., clubhouse, parks, etc.), and odors would be localized in a manner that would not affect a substantial number of people. Furthermore, the Home Owner Association (HOA) will establish controls for odors at

dumpster sites. Therefore, potential odor impacts created by the Proposed Project would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Climate Change

Impact AIR-9:	**Greenhouse gas emissions created by the project are considered to be potentially significant if the project would result in an increase in greenhouse gas emissions that would significantly hinder or delay California's ability to meet the reduction targets contained in AB 32.**

Impact Analysis

While neither the California Appendix G, Guidelines, nor any judicial decision, CEQA regulation, or statute require an evaluation of a project's impact on greenhouse gases, consistent with the public policy rationale underlying AB 32, this report does, in fact, fully analyze the project's impacts on greenhouse gas emissions. The project's potential greenhouse gas emissions and possible impacts on global climate change are addressed in a detailed report prepared by MBA (2007) included in Appendix B of this EIR. The following information is summarized from that report.

Parts of the Earth's atmosphere act as an insulating blanket of just the right thickness, trapping sufficient solar energy to keep the global average temperature in a suitable range. The blanket is a collection of atmospheric gases called greenhouse gases, based on the idea that the gases also trap heat like the glass walls of a greenhouse. These gases—water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone, chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)—all act as effective global insulators, reflecting back to Earth visible light and infrared radiation. Human activities such as producing electricity and driving vehicles have elevated the concentration of these gases in the atmosphere. A warmer Earth may lead to changes in rainfall patterns, much smaller polar ice caps, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans.

Regulatory Authority

Relative to greenhouse gas (GHG) emissions and global climate change, the State Legislature approved AB 32 in 2007, which seeks to reduce GHG emissions to 1990 levels by 2020. This same level of GHG reduction is encouraged through Executive Order S-3-05 by California Governor Arnold Schwarzenegger. In addition, the State Legislature passed SB 97 in 2008, which establishes a

target of 2009 for the Office of Planning and Research to identify how CEQA documents will deal with GHG emissions and global climate change.

Project-Specific Impacts

There are no project-level thresholds to measure the significance of a project's impact on global climate change. Thus, a standard CEQA "significance" determination is difficult to make in this context. Nevertheless, the following two-part approach is used to address greenhouse gas thresholds and assess the significance of the project's contribution to global climate change:

1. Inventory: An inventory of greenhouse gas emissions generated by the project is presented for informational purposes.
2. Compliance with Strategies: Project compliance with the current California strategies to reduce greenhouse gases is assessed.

Inventory

The project would emit greenhouse gases from combustion of fuels during construction from worker vehicles and construction equipment. The project emissions of carbon dioxide from project construction are shown in Table 4.2-9 below. Emissions of nitrous oxide and methane are negligible. As shown in Table 4.2-9, construction would emit approximately 3,744 tons of carbon dioxide or 0.0034 million metric tons of carbon dioxide equivalent ($MMTCO_2e$).

Table 4.2-9: Construction Greenhouse Gas Emissions

Activity	Carbon Dioxide Emissions (tons)	$MMTCO_2e$*
Mass grading	793	0.0007
Fine grading	124	0.0001
Trenching	60	0.0001
Asphalt paving	64	0.0001
Building	2,683	0.0024
Coating	20	0.0000
Total	**3,744**	**0.0034**

Source: URBEMIS2007, Appendix A
* Million metric tons of carbon dioxide equivalent converted from tons of carbon dioxide by multiplying by 0.902 and dividing by 1,000,000

During operation of the project, greenhouse gas emissions would result from motor vehicles (cars and small trucks visiting the project site), natural gas consumption, indirect emissions from electricity generation, indirect emissions from water transportation, landscape, and fugitive refrigerants (air conditioning and refrigerator). A summary of the anticipated greenhouse gas emissions from operation of the Proposed Project is presented in Table 4.2-10.

Table 4.2-10: Operational Greenhouse Gas Emissions

Source	$MTCO_2e$ per year	$MMTCO_2e$ per year
Motor vehicles	10,769	0.011
Natural gas	2,175	0.002
Indirect electricity	2,004	0.002
Hearth	3	0.000
Water transport	1,685	0.002
Landscape	2	0.000
Refrigerants	3,163	0.003
Total	**19,801**	**0.020**

Source: URBEMIS2007 output and spreadsheets contained in Appendix A
$MTCO_2e$ = metric tons of carbon dioxide equivalent
$MMTCO_2e$ = million metric tons of carbon dioxide equivalent

Compliance with State Strategies

To assess compliance with California strategies to reduce greenhouse gas emissions, two main documents where used. The first is the 2006 Climate Action Team Report to Governor Schwarzenegger (2006 CAT Report) and the second is the CARB's early action measures for AB 32.

One of the greenhouse gas emission reduction targets proposed through Executive Order S-3-05 by California Governor Arnold Schwarzenegger is to reduce the state's greenhouse gas emissions to 1990 levels by 2020. AB 32 sets a mandatory requirement to achieve the same reduction.

The 2006 CAT Report is not in response to AB 32; however, the 2006 CAT Report introduces strategies that can be implemented by the CARB and other California agencies to reduce California's emissions to 1990 levels by 2020, which is the same target for AB 32. In addition, the 2006 CAT Report is consistent with the intent of AB 32. AB 32 contains a timeline for development and approval of strategies to reduce state emissions. The bulk of the strategies are not yet developed. Therefore, in the absence of climate change thresholds and standards, the strategies published for Executive Order S-3-05 are used for this analysis because they contain the most complete list of strategies as of the date of this analysis.

A full assessment of project consistency with the 2006 CAT Report strategies is contained in the Global Climate Change Analysis contained in Appendix B. The applicable strategies are shown in Table 4.2-11. As shown in the table, with mitigation, the project is consistent the applicable strategies.

Table 4.2-11: Greenhouse Gas Emission Reduction Strategy Consistency Analysis

Agency	Greenhouse Gas Emission Reduction Strategy	Consistency Analysis
California Air Resources Board	**Vehicle Climate Change Standards** AB 1493 required the State to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of climate change emissions emitted by passenger vehicles and light-duty trucks. Regulations were adopted by the ARB in September 2004.	**Consistent**: The vehicles that access the project will be in compliance with any vehicle standards that CARB proposes.
California Air Resources Board	**Diesel Anti-Idling** In July 2004, the CARB adopted a measure to limit diesel-fueled commercial motor vehicle idling.	**Consistent**: Mitigation AIR-3b includes provisions intended to prevent idling of delivery trucks to the clubhouse.
	Hydrofluorocarbon Reduction (1) Ban retail sale of HFC in small cans; (2) require that only low GWP refrigerants be used in new vehicular systems; (3) adopt specifications for new commercial refrigeration; (4) add refrigerant leak-tightness to the pass criteria for vehicular inspection and maintenance programs; (5) enforce federal ban on releasing HFCs.	**Consistent**: This measure applies to consumer products. When CARB adopts regulations for these reduction measures, any products that the regulations apply to will comply with the measures.
	Transportation Refrigeration Units (TRUs), Off-Road Electrification, Port Electrification Strategies to reduce emissions from TRUs, increase off-road electrification, and increase use of shore-side/port electrification.	**Consistent**: The project is not expected to have TRUs visiting the project site, but Mitigation AIR-3b limits idling for delivery trucks.
	Heavy-Duty Vehicle Emission Reduction Measures Increased efficiency in the design of heavy-duty vehicles and an education program for the heavy-duty vehicle sector.	**Consistent**: These are CARB-enforced standards; vehicles that access the project that are required to comply with the standards will comply with the strategy.
	Achieve 50% Statewide Recycling Goal Achieving the State's 50 percent waste diversion mandate as established by the Integrated Waste Management Act of 1989 (AB 939, Sher, Chapter 1095, Statutes of 1989) will reduce climate change emissions associated with energy-intensive material extraction and production as well as methane emission from landfills. A diversion rate of 48 percent has been achieved on a statewide basis. Therefore, a 2 percent additional reduction is needed.	**Consistent**: Mitigation Measures US-4a and US-4b require the Proposed Project to implement recycling and waste diversion measures during the construction and operation phases, respectively.

Table 4.2-11: Greenhouse Gas Emission Reduction Strategy Consistency Analysis (Cont.)

Agency	Greenhouse Gas Emission Reduction Strategy	Consistency Analysis
Department of Forestry	**Urban Forestry** A new statewide goal of planting 5 million trees in urban areas by 2020 would be achieved through the expansion of local urban forestry programs.	**Consistent**: Specific Plan contains extensive landscaping including hundreds of trees that will grow to maturity in this location. Trees are expected to be both low emitters of VOC and efficient users of water.
Department of Water Resources	**Water Use Efficiency** In California, approximately 19 percent of all electricity, 30 percent of all natural gas, and 88 million gallons of diesel are used to convey, treat, distribute and use water and wastewater. Increasing the efficiency of water transport and reducing water use would reduce greenhouse gas emissions.	**Consistent**: The Proposed Project would incorporate a variety of design features intended to promote sustainability through trip reduction and energy and water conservation. Water conservation measures are designed into the project; including: tankless hot water heaters that reduce water consumption; green roofs on the clubhouse and high density housing buildings that capture stormwater runoff during the rainy season and keep building interiors cool during warmer months; bioswales that promote percolation of stormwater runoff; and evapotranspiration-based water controllers that adjust outdoor irrigation in response to weather conditions.
California Energy Commission	**Building Energy Efficiency Standards in Place and in Progress** Public Resources Code 25402 authorizes the CEC to adopt and periodically update its building energy efficiency standards (that apply to newly constructed buildings and additions and alterations to existing buildings).	**Consistent**: The Proposed Project would incorporate a variety of design features intended to promote sustainability through trip reduction and energy and water conservation. Mitigation Measure AIR-9a requires implementation of extensive energy conservation measures including: use of glass windows to promote natural day lighting of interior areas to reduce need for lighting, occupancy sensors that automatically shut off lights when rooms are unoccupied, high-efficiency clothes washers and dishwashing machines, recirculating hot water systems, and tankless water heaters.
	Appliance Energy Efficiency Standards in Place and in Progress Public Resources Code 25402 authorizes the Energy Commission to adopt and periodically update its appliance energy efficiency standards (that apply to devices and equipment using energy that are sold or offered for sale in California).	**Consistent**: Mitigation Measure AIR-9a requires the use of occupancy sensors that automatically shut off lights when rooms are unoccupied, high-efficiency clothes washers and dishwashing machines, recirculating hot water systems, and tankless water heaters.

Table 4.2-11: Greenhouse Gas Emission Reduction Strategy Consistency Analysis (Cont.)

Agency	Greenhouse Gas Emission Reduction Strategy	Consistency Analysis
Building, Transportation, and Housing Agency	**Smart Land Use and Intelligent Transportation Systems (ITS)** Smart land use, demand management, ITS, and value pricing are critical elements in this plan for improving mobility and transportation efficiency. Specific strategies include promoting jobs/housing proximity and transit-oriented development; encouraging high density residential/commercial development along transit/rail corridor; valuing and congestion pricing; implementing intelligent transportation systems, traveler information/traffic control, and incident management; accelerating the development of broadband infrastructure; and comprehensive, integrated, multimodal/intermodal transportation planning.	**Consistent**: The Proposed Project is not an in-fill project or a mixed-use project. However, it is designed to provide a pedestrian-oriented environment that is also readily accessible for bicycles and public transit in proximity to the CSUSB campus. The project is located within walking distance of several major existing activity centers, including the CSUSB campus and several smaller shopping centers at University Parkway and Kendall Drive. The Proposed Project is located next to the Foothill Trail and will have pedestrian/bike connections with the trail at several points. The project includes a clubhouse that would be served by OmniTrans bus service, including routes serving destinations in the City of San Bernardino and elsewhere. Mitigation Measure AQ-3a requires the project to provide bicycle parking at the clubhouse and all parks. All of these measures are consistent with smart land use and ITS strategies.
	Measures to Improve Transportation Energy Efficiency Builds on current efforts to provide a framework for expanded and new initiatives including incentives, tools, and information that advance cleaner transportation and reduce climate change emissions.	**Consistent**: The Proposed Project promotes fuel conservation through design features, which promote pedestrian traffic, and programs that encourage employee carpooling and public transportation use.
State Consumer Services Agency	**Green Buildings Initiative** Green Building Executive Order, S-20-04 (CA 2004), sets a goal of reducing energy use in public and private buildings by 20 percent by the year 2015, compared with 2003 levels. The Executive Order and related action plan spell out specific actions State agencies are to take with state-owned and -leased buildings. The order and plan also discuss various strategies and incentives to encourage private building owners and operators to achieve the 20 percent target.	**Consistent**: Mitigation Measure AIR-9b requires the project to exceed the 2005 Title 24 standards. Mitigation Measure US-1a, US-1b, and US-1c require the project to implement several water conservation measures. Mitigation Measure US-5 requires the project to implement energy conservation measures. In addition, the design guidelines require the use of fluorescent light fixtures instead of incandescent fixtures that will reduce energy use.
Source: Michael Brandman Associates 2007.		

Under AB 32, the ARB has the primary responsibility to reduce greenhouse gas emissions in California. The ARB published a list of early action measures to reduce greenhouse gases in

California. The ARB anticipates that these early action measures will reduce emissions by 25 percent of the 2020 target. Other measures will follow in the coming years. A review of the ARB's reduction measures underway or to be initiated by the ARB in the 2007 to 2012 timeframe indicates that only a few measures would be applicable to the project. Some of the measures are regulatory and some are non-regulatory. Many of the measures have not been considered by the ARB Board as of yet. Therefore, if the Proposed Project voluntarily chooses to be consistent with the strategies, then it would be consistent with the State's strategies to reduce climate change ahead of schedule.

The Cool Communities Program is anticipated to have a ARB hearing date in the third quarter of 2008. This program is recommended to be a non-regulatory voluntary program with guidelines to foster the establishment or transition to cool communities in California. The strategies to be adopted in the Cool Communities Program guidelines include the following: cool roofs, cool pavements, and shade trees/urban forest. With mitigation and project design features, the Proposed Project is consistent with the ARB early reduction measures.

Summary

Note that emissions models such as EMFAC and URBEMIS evaluate aggregate emissions and do not demonstrate, with respect to a global impact, how much of these emissions are **"**new**"** emissions specifically attributable to the Proposed Project. For most projects, the main contribution of greenhouse gas emissions is from motor vehicles, but how much of those emissions are **"**new**"** is uncertain. New projects do not create new drivers. Some mixed use and transportation-oriented projects can actually reduce the number of vehicle miles that a person drives; this reduction is not typically discussed in CEQA documents. Due to the uncertainty of new emissions produced by the Proposed Project, it is anticipated that the project will not substantially add to the global inventory of greenhouse gas emissions. Nevertheless, greenhouse gas emissions are estimated using procedures similar to those for criteria pollutants (see Appendix B).

Global warming has been recognized as a viable threat to life on earth. The potential health effects from global climate change may be from temperature increases, climate-sensitive diseases, extreme events, and air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and fewer extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems. Heat-related problems include heat rash and heat stroke. In addition, climate-sensitive diseases may increase, such as those spread by mosquitoes and other disease-carrying insects, including malaria, dengue fever, yellow fever, and encephalitis. Extreme events such as flooding and hurricanes can displace people and agriculture, which would have negative human health consequences that include the spreading of disease and death. Global warming may also contribute to air quality problems from increased amounts of smog and particulate air pollution.

It is often the case that mitigation for greenhouse gases is also beneficial to local criteria air pollution reductions. Many greenhouse gas mitigation increase energy efficiency, which would reduce criteria

pollutants as well. Two mitigation measures in this document would directly or indirectly contribute to reductions in greenhouse gas emissions of the UHSP project (see MM AIR-9a and MM AIR-9b).

In addition to the measures listed at the end of this section, the project contains design features and other sections of the EIR describe additional mitigation measures to help serve the dual purpose of reducing criteria and GHG emissions from the Proposed Project. These design features include the following:

- The UHSP outlines how project development will comply with applicable guidelines of the Leadership in Energy and Environmental Design (LEED) "Green Building Program" to minimize energy use impacts on the environment. The project design will help reduce vehicle miles traveled which is one of the major sources of greenhouse gases (i.e., motor vehicle emissions). Therefore, a reduction of vehicle miles travels equates to a reduction in greenhouse gas emissions.
- The UHSP will provide pedestrian and bicycle facilities to interconnect with regional trails. Internal project streets will be pedestrian friendly with inter-connections to all portions of the project area and all surrounding uses such as the CSUSB campus. These trails will provide a link to the City's Master Plan of Trails. The pedestrian and bicycle facilities will help to reduce vehicle trips thereby reducing greenhouse gas emissions.
- Landscaping will be provided throughout the project site to include a mix of deciduous and evergreen trees, shrubs, vines, and various types of groundcover. The residential component proposes a combination of street trees, under story trees, accent trees, alley trees, buffer plantings, vines, and turf. The recreation and open space component proposes a combination of accent and shade trees and groundcover plantings along the San Andreas Fault. The remainder of the site is proposed to remain as open space and no landscaping is proposed for this portion. The clubhouse component proposes evergreen trees, landscaping at project site entrance points and at building entrances, canopy trees within parking lots, and various landscaping along walkways and building edges. The onsite landscaping helps to counter-balance the project's contribution of greenhouse gases by providing onsite carbon storage. The trees and shrubs take in carbon dioxide and store it.
- Approximately 10.2 acres of public and private parks will be provided to meet the City requirement of 5 acres per 1,000 residents for new development. These parks may include picnic areas, tot lots, trails, and open play fields. Parks will help to reduce vehicle trips because the uses will be accessible to those living within the project area.
- The project will implement a number of sustainable or "smart growth" design elements including clustering of development with smaller lots and buildings, walkability, water and energy conservation, and access to Omnitrans transit node at the CSUSB campus less than a mile from the project site.

Cumulative Impacts

According to CEQA Guidelines 15145, if a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate the discussion of the impact. The assessment of cumulative global climate change impacts, which are project impacts plus all the other "cumulative" projects, is speculative at this time for the following reasons:

- The list of cumulative projects for climate change is unknown, in that it could conceivably include all projects around the globe. Guidelines for establishing the radius for global climate change have not yet been adopted. Without such guidelines, it is impossible to know how big the impact study area is supposed to be. For example, does the list of projects include those only within a one-mile radius of the project, or does it include projects within the entire air basin, or the state of California? For this reason, the "project list" approach for conducting a CEQA cumulative impacts analysis is not feasible.
- There is no approved plan that covers the jurisdiction of the project that discusses global climate change or greenhouse gases; therefore, the plan approach is not viable at this time. If the City prepares a Greenhouse Gas Reduction Plan or incorporates climate change policies in its general plan, perhaps a cumulative analysis could be based on that, as in the plan approach. However, at this time, no such document exists to base this cumulative discussion or significance finding on. State and local agencies are currently developing strategies to reduce greenhouse gases in their jurisdictions; however, these strategies are not complete at this time.
- There are no thresholds for measuring project or cumulative impacts of greenhouse gases.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM AIR-9a Areas and/or facilities to encourage recycling shall be provided and installed in all MDA and A (attached) residential areas (Planning Areas 5, 6, 8-11, 13, 14, 16, `8, and 20) and in the clubhouse (Planning Area 7) consistent with City requirements.

MM AIR-9b To increase energy efficiency, the following measures shall be implemented to the satisfaction of the City of San Bernardino: a) there shall be a minimum 10 percent reduction in all buildings, combined space heating, cooling, and water heating energy compared to the current Title 24 Standards; b) the project shall incorporate light roof colors and cool pavements in the residential driveway areas; c) each appliance (i.e., washer/dryers, refrigerators, stoves, etc.) provided by the builder must be Energy Star qualified if an Energy Star designation is applicable for that appliance; d) low-flow appliances (i.e., toilets, dishwashers, shower heads, washing machines) shall be installed and; e) solar powered water heaters and photovoltaic cells (solar panels) shall be offered to homebuyers as an option.

Level of Significance After Mitigation

With the project design features and mitigation contained throughout this EIR, the impacts to climate change from the Proposed Project as well as the potential impacts from climate change to the Proposed Project are less than significant.