

3.5 Air Quality

This section examines whether implementation of the General Plan will violate any air quality standard, result in a cumulatively considerable net increase of any criteria pollutant, or expose sensitive receptors to substantial pollutant concentrations. Through the Initial Study process, issues regarding potential conflicts with implementation of the applicable air quality plan and creating objectionable odors were found to have a less-than-significant impact. This section is based on air quality worksheets generated by Cotton/Bridges/Associates (February 2002) which are included in Appendix D of this EIR.

ENVIRONMENTAL SETTING

The City of Rancho Santa Margarita is located within the South Coast Air Basin. The basin is a 6,600-square mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. The basin includes all of Orange County and the non-desert portions of Los Angeles, San Bernardino, and Riverside counties. Air quality within the basin is administered by the South Coast Air Quality Management District (SCAQMD).

The basin is a physical unit that, due to low wind speeds and a prevailing inversion layer, retains pollutants for substantial periods. The slow dispersal of pollutants results in high concentrations of primary pollutants including carbon monoxide (CO), hydrocarbons, oxides of nitrogen (NOx), and fine particulate matter (PM10). It also supports the formation of ozone as hydrocarbons and oxides of nitrogen combine in sunlight.

Climate and Meteorology

The basin has a typical Mediterranean climate. The temperature in Orange County averages 62 degrees Fahrenheit annually. With the strong summer breezes and the oceanic thermal reservoir, the range of temperatures generally remains between 30 and 90 degrees Fahrenheit. Almost all precipitation occurs between November and March, although during these months, it is sunny or partly sunny most of the time.

Winds around Rancho Santa Margarita are generally cyclic, with an onshore breeze blowing from the southwest and west, especially in the summer, during the day, while at night, especially during the winter, a weak off-shore breeze occurs. Occasionally these cyclical breezes are interrupted by strong, dry, warm desert winds (Santa Anas) from the north/northwest.

The topography and climate of Southern California combine to make the basin an area of high air pollution potential. During the summer months, a warm air mass frequently descends over the cool, moist marine layer produced by the interaction between the ocean's surface and the lowest layer of the atmosphere. The warm upper layer forms a

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cup over the cool marine layer, which prevents pollution from dispersing upwards. This inversion allows pollutants to accumulate within the lower layer. Light winds during the summer further limit ventilation.

Because of the low average wind speeds in the summer and a persistent daytime temperature inversion, emissions of hydrocarbons and oxides of nitrogen have an opportunity to combine with sunlight in a complex series of reactions. These reactions produce a photochemical oxidant, more commonly known as smog.

Air Quality Standards

The State of California and the federal government have established air quality standards and emergency episode criteria for various pollutants. These standards are used to determine attainment of state and federal air quality goals and plans. Generally, state regulations have stricter standards than those at the federal level. Air quality standards are set at concentrations that provide a sufficient margin of safety to protect public health and welfare. Episode criteria define air pollution concentrations at the level where short-term exposures may begin to affect the health of a portion of the population particularly susceptible to air pollutants. The health effects are progressively more severe and widespread as pollutant concentrations increase. The health effects of and the current state and federal standards for the most important pollutants are presented in Table 5.

The South Coast Air Basin has the worst air quality problems in the nation. Despite implementing many strict controls, the basin still fails to meet state and federal air quality standards for four of the six criteria pollutants including ozone, nitrogen dioxide (NO₂), carbon monoxide (CO), and fine particulate matter (PM₁₀). Because the state and federal standards cannot be achieved, the basin is considered a “non-attainment” area.

Monitored Air Quality

Rancho Santa Margarita is split between South Coast Air Quality Management District Source Receptor Areas 19 (Saddleback Valley) and 21 (Capistrano Valley). Presently there is no active monitoring station in Area 21, as ozone and carbon monoxide measurements were made at Capistrano Valley for a period of time during the 1970's and 1980's, but pollution levels were much lower than in other parts of the basin, and monitoring was therefore discontinued. Therefore some existing conditions data is relied on from Area 19 - Saddleback Valley Monitoring Area; the monitoring station only measures CO, ozone, and PM₁₀. It does not measure for nitrogen dioxide or sulfur dioxide. The closest monitoring station which measures for nitrogen dioxide and sulfur dioxide is the North Coastal Orange County monitoring station located 20 miles north of the City in the Area 18. Unlike Rancho Santa Margarita, the North Coastal Orange Monitoring Area is located near the ocean in the northern portion of Orange County. Table 6 summarizes the number of days the state standards were exceeded for carbon monoxide, ozone, nitrogen dioxide, sulfur dioxide, and PM₁₀ for even years 1990 through 2000.

Table 5
Air Pollution Sources, Effects, and Standards

Air Pollutant	State Standard	Federal Primary Standard	Sources	Primary Effects
Ozone (O ₃)	0.09 ppm, 1-hour average	0.12 ppm, 1-hour average	Atmospheric reaction of organic gases with nitrogen oxides in sunlight	Aggravation of respiratory and cardiovascular diseases, irritation of eyes, impairment of cardiopulmonary function, plant leaf injury
Carbon Monoxide (CO)	9.0 ppm, 8-hour average 20 ppm, 1-hour average	9.0 ppm, 8-hour average 35 ppm, 1-hour average	Incomplete combustion of fuels and other carbon-containing substances such as motor vehicle exhaust, natural events, such as decomposition of organic matter	Plan[t] injury. Reduced visibility. Deterioration of metals, textiles, leather, finishes, coatings, and so on. Irritation of eyes. Reduced lung infection. Aggravation of respiratory diseases (asthma, emphysema).
Nitrogen Dioxide (NO ₂)	0.25 ppm, 1-hour average	0.053 ppm, annual avg.	Motor vehicle exhaust, high-temperature stationary combustion, atmospheric reactions	Aggravation of respiratory illness, reduced visibility, reduced plant growth, formation of acid rain.
Sulfur Dioxide (SO ₂)	0.25 ppm, 1-hr. avg. 0.04 ppm, 24-hr. avg.	0.14 ppm, 24-hour average	Combustion of sulfur-containing fossil fuels, smelting of sulfur-bearing metal ores, industrial processes	Plan[t] injury. Reduced visibility. Deterioration of metals, textiles, leather, finishes, coatings, and so on. Irritation of eyes. Reduced lung infection. Aggravation of respiratory diseases (asthma, emphysema).
Fine Particulate Matter (PM ₁₀)	50 µg/m ³ , 24-hr. avg.	150 µg/m ³ , 24-hr. avg.	Stationary combustion of solid fuels, construction activities, industrial processes, industrial chemical reactions	Reduced lung function, aggravation of the effects of gaseous pollutants, aggravation of respiratory and cardio-respiratory diseases, increased coughing and chest discomfort, soiling, reduced visibility
Lead	1.5 µg/m ³ , 30-day average	1.5 µg/m ³ , calendar quarter	Contaminated soil	Impairment of blood function and nerve construction. Behavior and hearing problems in children.
Visibility Reducing Particles	Reduces visual range to less than 10 miles at relative humidity less than 70%, 8-hour avg (9am - 5pm).	None		Visibility impairment on days when relative humidity is less than 70 percent

Source: South Coast Air Quality Management District, *CEQA Air Quality Handbook*, Chapter 3 Tables 3-1 and 3-2, November 2001 (Version 3) update.

Table 6
Ambient Air Quality Summary,
Saddleback Valley and North Coastal Orange County
Monitoring Stations

Year/ Monitoring Station	Carbon Monoxide		Ozone		Nitrogen Dioxide		Sulfur Dioxide		Fine Particulate Matter	
	Max. 8-hr. con- centration (ppm)	Days State Standard Exceeded 0.09 ppm	Max. 1-hr con- centration (ppm)	Days State Standard Exceeded 0.09 ppm	Max. 1-hr con- centration (ppm)	Days State Standard Exceeded 0.25 ppm	Max. 24-hr. con- centration (ppm)	Days State Standard Exceeded 0.25 ppm	Max. 24-hr. con- centration (ppm)	No. of Samples Exceeding >50ug/m3
1990										
#18	10.7	5	.15	12	.22	0	.008	0	--	--
#19	5.6	0	.19	32	--	--	--	--	88	16
1992										
#18	9.1	1	.15	21	.23	0	.010	0	--	--
#19	7.3	0	.16	31	--	--	--	--	83	5
1994										
#18	7.9	0	.12	3	.16*	0*	.009	0	--	--
#19	5.4	0	.18	16	--	--	--	--	91	7
1996										
#18	7.3	0	.10	1	.14	0	.004*	0*	--	--
#19	4.0	0	.14	20	--	--	--	--	79	4
1998										
#18	7.0	0	.12	5	.12	0	.008	NA	--	--
#19	3.1*	0*	.16	15	--	--	--	--	70	6
2000										
#18	6.3*	0*	.10	1	.11	0	.008	NA	--	--
#19	2.3*	0*	.13*	3*	--	--	--	--	60	1

ppm = parts per million parts of air

-- = Pollutant not monitored

* = Less than 12 full months of data. May not be representative.

NA = Data not available.

As illustrated in Table 6, although ozone levels have continued to show improvement at both the North Coastal Orange County and Saddleback Valley monitoring stations, the state ozone standard was exceeded an average of 7 days each year at the North Coastal Orange County station and an average of 20 days at the Saddleback Valley monitoring station. Saddleback Valley monitoring station is closer to Rancho Santa Margarita, so the conditions at that location are more representative of actual conditions in the project area. Also illustrated in Table 6, fine particulate matter levels have improved at the Saddleback Valley monitoring station; however, the State fine particulate matter standard was exceeded an average of 7 days each year.

Air Quality Management Plan

Both California and the federal government require nonattainment areas, such as the South Coast Air Basin, to prepare an Air Quality Management Plan (AQMP) to reduce air pollution to healthful levels. The California Clean Air Act of 1988 and amendments

to the federal Clean Air Act in 1990 required stricter air pollution control efforts than ever before. For example, the State must submit plans to the federal government showing how nonattainment areas in California will meet federal air quality standards by specific deadlines.

The 1994 and 1997 South Coast Air Basin AQMPs incorporate a number of measures to reduce air pollution in the Basin to meet federal and State requirements. These measures include strategies to meet federal and State standards for CO, PM10, NO₂, and ozone; control of toxic air contaminants and acutely hazardous emission; and control of global warming and ozone depleting gases. The measures are updated periodically.

THRESHOLDS USED TO DETERMINE LEVEL OF IMPACT

Implementation of the General Plan will result in a significant impact if it 1) violates any air quality standard or contributes substantially to an existing air quality violation, 2) results in a cumulatively considerable net increase in any criteria pollutant, or 3) exposes sensitive receptors to substantial pollutant concentrations.

The SCAQMD has established air pollutant emission thresholds to assist lead agencies in determining whether or not the construction or operation of the project would result in significant impacts. If the lead agency finds that the project has the potential to exceed these thresholds, the project is considered to have a significant impact on air quality. These thresholds are summarized in Table 7.

Table 7
SCAQMD Thresholds for Significant
Contribution to Regional Air Pollution

Pollutant	Threshold of Significant Effect	
	Operation Phase	Construction Phase
Reactive Organic Gases (ROG)	75 lbs/day	75 lbs/day, 2.5 tons/quarter
Oxides of Nitrogen (NO _x)	100 lbs/day	100 lbs/day, 2.5 tons/quarter
Carbon Monoxide (CO)	550 lbs/day	550 lbs/day, 24.75 tons/quarter
Fine Particulate Matter (PM10)	150 lbs/day	150 lbs/day, 6.75 tons/quarter

Source: *CEQA Air Quality Handbook*. South Coast Air Quality Management District. May, 1993 with Updates through 2001.

ENVIRONMENTAL IMPACT

Short-Term Construction Impacts

At the individual project level, construction-related emissions sources will include: (1) construction equipment emissions, (2) dust from grading and earthmoving operations, and (3) emissions from workers' vehicles traveling to and from construction sites.

Construction-related air quality impacts will occur continuously over the next 20 years as individual development projects are constructed. Because Rancho Santa Margarita is almost fully developed, many development projects are likely to be small in scale (remodeling, room additions, etc.). Construction activity will primarily generate airborne dust, carbon monoxide, and nitrogen dioxide. In addition, volatile organic compounds (VOC) will be released from architectural coatings, exterior paints, and asphalt. Because the Draft General Plan identifies future land uses and does not contain specific development proposals, construction-related emissions of individual future developments cannot be quantified at this time.

To work toward improving air quality for future generations of Rancho Santa Margarita residents, the City has prepared the Conservation and Open Space Element of the General Plan which addresses air quality. This Element includes the following goals and policies:

Goal 6 *Cooperate with local and regional agencies to improve air quality.*

Policy 6.1 Cooperate with South Coast Air Quality Management District and Southern California Association of Governments in their efforts to implement the regional Air Quality Management Plan.

Policy 6.2 Integrate air quality planning with land use, economic development, and transportation planning.

Policy 6.3 Encourage the expansion and retention of local serving retail businesses (e.g. restaurants, family medical offices, drug stores) to reduce the number and length of automobile trips to comparable services located in other jurisdictions.

Policy 6.4 Encourage alternative modes of transportation, such as walking, biking, and public transportation to reduce emissions associated with automobile use.

Construction-related impacts will be temporary in nature and can be reduced to a less-than-significant level through compliance with SCAQMD Rule 403 for reducing construction-related emissions, adherence to existing regulations, and through implementation of air quality policies specified in the Open Space and Conservation Element. With enforcement of existing regulations, an otherwise potentially significant impact can be reduced or avoided.

Long-Term Operation Impacts

Development pursuant to General Plan policy over the life of the Plan will result in the addition of approximately 687 net new units to the City's housing stock, for a total of 17,608 units, and an additional 698,000 square feet of nonresidential development (see Table 1 in the Project Description of this EIR), for a total of 13.64 million square feet. This development will generate additional emissions from stationary sources and vehicle trips. Stationary sources are defined by the SCAQMD to be those sources that emit pollution from equipment, or industrial or commercial processes. Table 8 reports estimated air pollution emission in pounds per day associated with existing land use and land use assuming full implementation of the Land Use Plan. The worksheets showing calculations are contained in Appendix D.

Table 8
Estimated Air Pollutant Emissions Associated With
Existing Land Use and General Plan Land Use
(Pounds per Day)

Pollutant	Existing Land Use	Proposed Land Use	Difference	Percent Change
Reactive Organic Compounds	24,636	25,762	1,126	5%
Carbon Monoxide	60,238	63,257	3,019	5%
Nitrogen Dioxide	6,361	6,699	338	5%
Particulate Matter	4,783	5,005	222	5%

As shown in Table 8, at buildout, total reactive organic compounds, carbon monoxide, nitrogen dioxide, and particulate matter air pollutant emissions are expected to increase over time. Given that Rancho Santa Margarita lies within a non-attainment area and any new development will contribute to a relative increase in emissions from mobile and stationary sources, air quality impacts associated with implementation of the Draft Plan are considered adverse and significant.

To improve air quality for future generations of Rancho Santa Margarita residents and within the Basin as a whole, and to assist with regional efforts to improve air quality over the long term, the City has prepared the Conservation and Open Space Element of the General Plan, which addresses air quality. This section includes the following goals and policies:

Goal 6: *Cooperate with local and regional agencies to improve air quality.*

Policy 6.1: Cooperate with the South Coast Air Quality Management District and Southern California Association of Governments in their efforts to implement the regional Air Quality Management Plan.

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- Policy 6.2:** Integrate air quality planning with land use, economic development, and transportation planning.
- Policy 6.3:** Encourage the expansion and retention of local serving retail businesses (e.g. restaurants, family medical offices, drug stores) to reduce the number and length of automobile trips to comparable services located in other jurisdictions.
- Policy 6.4:** Encourage alternative modes of transportation, such as walking, biking, and public transportation to reduce emission associated with automobile use.

While implementation of these policies will reduce the air quality impact to some extent, increased emissions generation will result in a significant, unavoidable impact.

MITIGATION MEASURES

Short-Term Construction Impacts

The City will implement Implementation Program COS-12 16 which will enforce SCAQMD Rule 403 requiring that during construction measures be implemented to reduce emissions.

Long-Term Operation Impacts

The City will implement Implementation Program LU-14 which establishes baseline environmental standards for air quality to assess environmental impacts of future development proposals.

The City will implement Implementation Programs C-9 and C-10 which promote the use of multi-modal transportation thereby reducing emissions.

The City will implement Implementation Program LU-8 which requires the City review development proposals for potential air quality impact pursuant to the California Environmental Quality Act (CEQA) and the South Coast Air Quality Management District CEQA Air Quality Handbook. Furthermore, the City will implement Implementation Programs C-9, C-10, and C-11 which reduce air quality impacts by using available land use and transportation planning techniques such as incorporation of public transit stops in new development; developing new park and ride lots; and extending the City's trails network to provide access to schools and commercial centers.

The City will implement Implementation Programs COS-18 through COS-21 which encourage energy conservation. Specifically, new development will be encouraged to incorporate energy conservation techniques; existing public buildings will install energy

saving devices; retrofit programs to reduce energy usage will be promoted; and electric vehicle charging areas will be included in new public and private developments.

LEVEL OF IMPACT AFTER MITIGATION

Short-Term Construction Impacts

Implementation of SCAQMD Rule 403, as called for in Implementation Program COS-12 ~~16~~, will help reduce the construction-related impacts to air quality. Given that the projected development will occur in small increments over a 20 year period, and that future development must comply with existing City, State, and SCAQMD regulations for reducing construction-related emissions, the level of impact after mitigation will be less than significant.

Long-Term Operation Impacts

Implementation of Implementation Programs LU-8, LU-14, C-9, C-10, C-11, COS-18, COS-19, COS-20, and COS-21 will reduce the air quality impacts to the extent feasible; however, the impact to long-term air quality will remain significant and unavoidable.

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