APPENDIX B
Air Quality

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AIR QUALITY IMPACT ANALYSIS

RODEO BERM REMOVAL PROJECT

LOS ANGELES COUNTY , CALIFORNIA

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CLIMATE AND METEOROLOGY

REGIONAL CLIMATE

The North Pacific high-pressure cell is the dominant climatic influence over the eastern North Pacific Ocean, particularly during the summer months. This high-pressure cell produces a predominantly northwesterly flow of maritime air over the California coastal waters. During the winter, the Pacific High weakens and moves south, resulting in weaker and less persistent northwesterly winds along the California coast than in the warmer half of the year.

As the air mass approaches the coast of California, this large-scale circulation pattern is modified by local influences. The differential heating between the desert and the adjacent Pacific Ocean modifies the prevailing winds, enhancing them during the warmer half of the year and weakening the winds during the colder portion. On a local and sub-regional basis, the airflow in California is channeled by its mountain ranges and valleys. The coastal mountain ranges limit the flow of maritime air into the interior of California. This transition from a cool and damp marine environment to a dry and warm continental climate therefore occurs over a fairly short distance.

SOUTH COAST AIR BASIN

The South Coast Air Basin (SCAB) is a 6,600 square mile coastal plain bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The SCAB includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. Basin-wide conditions are characterized by warm summers, mild winters, infrequent rainfall, moderate onshore daytime breezes, and moderate humidity levels.

All seasons generally exhibit onshore flows during the day and offshore flows at night, after the land cools below the temperature of the ocean. The likelihood of strong offshore flows, including Santa Ana winds, is greater during winter than during summer (California Air Resources Board [ARB] 1984).

The topography and climate of Southern California combine to produce unhealthful air quality in the SCAB. Low temperature inversions, light winds, shallow vertical mixing, and extensive sunlight, in conjunction with topographical features such as adjacent mountain ranges that hinder dispersion of air pollutants, combine to create degraded quality, especially in inland valleys of the basin.

AIR QUALITY SETTING

AMBIENT AIR QUALITY STANDARDS (AAQS)

In order to gauge the significance of the air quality impacts of the proposed Rodeo Berm Removal Project, those impacts, together with existing background air quality levels, must be compared to the applicable ambient air quality standards. These 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 those people most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise, called "sensitive receptors." Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed. Chronic exposure to ozone (the primary ingredient in photochemical smog) may lead to adverse respiratory health even at concentrations close to the ambient standard.

National AAQS were established in 1971 for six pollution species with states retaining the option to add other pollutants, require more stringent compliance, or to include different exposure periods. The initial attainment deadline of 1977 was extended several times in air quality problem areas like Southern California. In 2003, the Environmental Protection Agency (EPA) adopted a rule that extended and established a new attainment deadline for ozone for the year 2021. Because the State of California had established AAQS several years before the federal action and because of unique air quality problems introduced by the restrictive dispersion meteorology, there is considerable difference between state and national clean air standards. Those standards currently in effect in California are shown in Table 1. Sources and health effects of various pollutants are shown in Table 2.

The Federal Clean Air Act Amendments (CAAA) of 1990 required that the U.S. Environmental Protection Agency (EPA) review all national AAQS in light of currently known health effects. EPA was charged with modifying existing standards or promulgating new ones where appropriate. In 1997 EPA developed standards for chronic ozone exposure (8+ hours per day) and for very small diameter particulate matter (called "PM-2.5").

Planning and enforcement of the federal standards for PM-2.5 and for ozone (8-hour) were challenged by trucking and manufacturing organizations. In a unanimous decision, the U.S. Supreme Court ruled that EPA did not require specific congressional authorization to adopt national clean air standards. The Court also ruled that health-based standards did not require preparation of a cost-benefit analysis. The Court did find, however, that there was some inconsistency between existing and "new" standards in their respective attainment schedules. Such attainment-planning schedule inconsistencies centered mainly on the 8-hour ozone standard. EPA subsequently agreed to downgrade the attainment designation for a large number of communities to "non-attainment" for the 8-hour ozone standard. Because the South Coast Air Basin is far from attaining the 1-hour federal standard, the 8-hour ozone non-attainment designation will not substantially alter the attainment planning process. The compliance deadline for the 8-hour ozone standard has been extended to 2021.

Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards		Federal Standards		
		Concentration	Method	Primary	Secondary	Method
Ozone (O_3)	1 Hour	0.09 ppm (180 μg/m³)	Ultraviolet Photometry	0.12 ppm (235 μg/m³)	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.07 ppm (140 μg/m³)		0.08 ppm (157 μg/m³)		
Respirable Particulate Matter (PM_{10})	24 Hour	50 μg/m³	Gravimetric or Beta Attenuation	150 μg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 μg/m³		50 μg/m³		
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard		65 μg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 μg/m³	Gravimetric or Beta Attenuation	15 μg/m³		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m³)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m³)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m³)		35 ppm (40 mg/m³)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m³)		–	–	–
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	(new standard pending)	Gas Phase Chemiluminescence	0.053 ppm (100 μg/m³)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.25 ppm (470 μg/m³)		–		
Lead	30-Day average	1.5 μg/m³	Atomic Absorption	–	–	–
	Calendar Quarter	–		1.5 μg/m³	Same as Primary Standard	High Volume Sampler and Atomic Absorption
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	Ultraviolet Fluorescence	0.030 ppm (80 μg/m³)	–	Spectrophotometry (Pararosaniline Method)
	24 Hour	0.04 ppm (105 μg/m³)		0.14 ppm (365 μg/m³)	–	
	3 Hour	–		–	0.5 ppm (1,300 μg/m³)	
	1 Hour	0.25 ppm (655 μg/m³)		–	–	
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer–visibility of 10 miles or more (0.07–30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hour	25 μg/m³	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 μg/m³)	Ultraviolet Fluorescence			
Vinyl Chloride	24 Hour	0.01 ppm (26 μg/m³)	Gas Chromatography			

Table 2

Health Effects of Major Criteria Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter.	• Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions.	• Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
Ozone (O_3)	• 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.
Lead (Pb)	• Contaminated soil.	• Impairment of blood function and nerve construction. • Behavioral and hearing problems in children.
Fine Particulate Matter (PM-10)	• Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions.	• Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardio respiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
Fine Particulate Matter (PM-2.5)	• Fuel combustion in motor vehicles, equipment, and industrial sources: • Residential and agricultural burning. • Industrial processes. • Also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.	• Increases respiratory disease. • Lung damage. • Cancer and premature death. • Reduces visibility and results in surface soiling.
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California Air Resources Board, 2002.

Evaluation of the most current data on the health effects of inhalation of fine particulate matter prompted the California Air Resources Board (ARB) to recommend adoption of the statewide PM-2.5 standard that is more stringent than the federal standard. This standard was adopted on June 20, 2002. The State PM-2.5 standard is more of a goal in that it does not have specific attainment planning requirements like a federal clean air standard, but only requires continued progress towards attainment.

Similarly, the ARB extensively evaluated health effects of ozone exposure. A new state standard for an 8-hour ozone exposure was adopted in April 2005, which mirrors the federal standard. The California 8-hour ozone standard of 0.07 ppm is more stringent than the federal 8-hour standard of 0.08 ppm. The state standard, however, does not have a specific attainment deadline. California air quality jurisdictions are required to make steady progress toward attaining state standards, but there are no hard deadlines or any consequences of non-attainment. Similarly, a new State AAQS for NO_2 has been proposed for adoption that is more stringent than the federal standard.

Of the standards shown in Table 1, those for ozone (O_3), carbon monoxide (CO), and particulate matter (PM-10) are exceeded at times in the South Coast Air Basin. They are called "non-attainment pollutants." The CO standard is currently met in the basin, and re-designation to "attainment/maintenance" is anticipated shortly. Because of the variations in both the regional meteorology and in area-wide differences in levels of air pollution emissions, patterns of non-attainment have strong spatial and temporal differences. The number and severity of violations of clean air standards along Santa Monica Bay are much less than in other parts of the basin.

BASELINE AIR QUALITY

Existing levels of ambient air quality and historical trends and projections in the project area are well documented from measurements made by the South Coast Air Quality Management District (SCAQMD). Closest to the project site is the West Los Angeles monitoring station, and is therefore the most representative of the project area air quality. PM-10 data is not measured at the West Los Angeles station but it is measured at the next closest SCAQMD monitoring station in Hawthorne. Because neither station measures PM-2.5, measurements for PM-2.5 were not included in this study. Table 3 is a 5-year summary of monitoring data for the major air pollutants compiled from the two air monitoring stations.

Ozone and particulates are seen to be the two most significant air quality concerns. Ozone, the primary ingredient in photochemical smog, is obviously an important pollution problem in the Los Angeles basin. However, in West Los Angeles, only once in the past five years was there a violation of the national hourly ozone standard. Less than 2 percent of all days exceed the California one-hour standard. The federal 8-hour standard is has been exceeded only two times in the last five years. While the hourly maximum was highest in 2003, the year 2004 shows significant improvement. The coastal area ozone air quality problem is much less severe than in the greater Los Angeles air basin.

The project area also experiences frequent violations of standards for 10-micron diameter respirable particulate matter (PM-10). High dust levels occur during Santa Ana wind conditions, as well as from the trapped accumulation of soot, roadway dust and byproducts of atmospheric

Table 3

Air Quality Monitoring Summary
(Days Standards Were Exceeded and Maximum Observed Concentrations)

Pollutant/Standard	2000	2001	2002	2003	2004
Ozone					
1-hour > 0.09 ppm (S)	2	1	1	11	5
1-hour > 0.12 ppm (F)	0	0	0	1	0
8-hour > 0.08 ppm (F)	0	0	0	1	1
Max 1-hour Conc. (ppm)	0.100	0.099	0.118	0.134	0.107
Carbon Monoxide					
1-hour > 20. ppm (S)	0	0	0	0	0
8- Hour > 9. ppm (S,F)	0	0	0	0	0
Max 1-hour Conc. (ppm)	6.0	4.0	4.0	5.0	4.0
Max 8-hour Conc. (ppm)	4.3	3.0	2.7	2.7	2.3
Nitrogen Dioxide					
1-hour > 0.25 ppm (S)	0	0	0	0	0
Max 1-hour Conc. (ppm)	0.16	0.11	0.11	0.12	0.09
Respirable Particulates (PM-10)					
24-Hour > 50 $\mu g/m^3$ (S)	9/57	8/58	12/61	3/61	2/15
24-Hour > 150 $\mu g/m^3$ (F)	0	0	0	0	0
Max. 24-Hr. Conc. ($\mu g/m^3$)	74	75	121	58	52

(S) - State ambient standard; (F) - Federal ambient standard

Source: California Air Resources Board (ARB)
Data: West Los Angeles: Ozone, CO, NOx
Hawthorne: PM-10

chemical reactions during warm season days with poor visibility. Table 3 shows that almost 14 percent of all days in the last five years in Hawthorne experienced a violation of the State PM-10 standard. However, the three-times less stringent federal standard has not been exceeded in the past five years. The maximum 24-hour PM-10 concentration appears to be declining following a spike in 2002.

AIR QUALITY IMPACT

STANDARDS OF SIGNIFICANCE

Many air quality impacts that result from the dispersed mobile sources, i.e., the dominant pollution generators in the basin, often occur hours later and miles away after photochemical processes have converted the primary exhaust pollutants into secondary contaminants such as ozone. The incremental regional air quality impact of an individual project is generally immeasurably small. The SCAQMD has therefore developed suggested significance thresholds based on the volume of pollution emitted rather than on actual ambient air quality because the direct air quality impact of a project is not quantifiable on a regional scale. Any projects in the SCAB with daily emissions that exceed any of the following thresholds are recommended by the SCAQMD to be considered individually and cumulatively significant:

SCAQMD Emissions Significance Thresholds
(pounds per day)

Pollutant	Construction	Operations
ROG	75	55
NOx	100	55
CO	550	550
PM-10	150	150
SOx	150	150

Source: SCAQMD CEQA Air Quality Handbook, November, 1993 Rev.

Additional Indicators

In its CEQA Handbook, the SCAQMD also states that additional indicators should be used as screening criteria to determine the need for further analysis with respect to air quality. The additional indicators are as follows:

- Project could interfere with the attainment of the Federal or State ambient air quality standards by either violating or contributing to an existing or projected air quality violation.
- Project could result in population increases within the regional statistical area which would be in excess of that projected in the AQMP.
- Project could generate vehicle trips that cause a CO hot spot.
- Project might have the potential to create or be subjected to objectionable odors.
- Project could have hazardous materials on site and could result in an accidental release of air toxic emissions.
- Project could emit an air toxic contaminant regulated by District rules or that is on a federal or State air toxic list.
- Project could involve disposal of hazardous waste.
- Project could be occupied by sensitive receptors near a facility that emits air toxics or near CO hot spots.
- Project could emit carcinogenic air contaminants that could pose a cancer risk.

The proposed project will entail the removal of soil, some of which may be lead-contaminated. However, the lead particles are heavy and are not prone to becoming airborne. Except for exhaust from excavation equipment and on-road trucks, toxic air contaminants are not expected to be a project issue. There are no post-removal air quality impacts. Any potential air quality impacts would thus derive mainly from "criteria" air pollutants during removal operations with significance thresholds outlined above.

CONSTRUCTION IMPACT

FUGITIVE DUST (PM-10)

Dust (PM-10) emissions will be generated from on-site excavation and truck loading, from export of fill material via haul trucks, and from off-site placement and compaction of the exported material. PM-10 emission factors for construction activities are notoriously imprecise. For purposes of analysis, it has been assumed that the average daily excavation and subsequent disposal area totals two (2) acres on any given day. A maximum activity day was assumed to move 1,000 cubic yards, requiring 50 daily truck-loads of earth hauling.

In the absence of definitive data on silt content, soil moisture, wind speeds, etc., the "default" PM-10 emissions data from the SCAQMD CEQA Air Quality Handbook were used to calculate daily PM-10 emissions. These factors, from Table A9-9 of the handbook, are as follows:

Grading and Fill Placement	10.0 lbs/day/acre
Truck Loading/Unloading	0.031 lbs/ton

Daily PM-10 emissions are estimated as follows:

Excavation & Disposal	2 acres x 10 lb/acre	= 20.0 lbs/day
Truck Loading/Dumping	1,300 tons x 0.031 lbs/ton	= 40.3 lbs/day
Total		= 60.3 lbs/day

PM-10 emissions will be less than the 150 pound per day significance threshold. However, the non-attainment status of the air basin for PM-10, the rules of the SCAQMD (Rule 403), and the presence of dust-sensitive land uses near the project site all require that best available control measures (BACM's) for dust be used during berm removal. The matrix of recommended dust control measures is included in the mitigation section.

CONSTRUCTION EQUIPMENT EXHAUST

The disposal site will vary with the level of contamination of the excavated material. "Clean" material will be trucked to a landfill in Los Angeles County. Contaminated material will require disposal at a hazardous waste repository in the San Joaquin Valley or at desert locations in Riverside or Imperial Counties. The distance of daily hauling and associated air pollution emissions depends upon the currently unknown split between clean versus contaminated materials.

On-site equipment to extract the material and load the trucks was assumed to use a rubber-tired dozer and a rubber tired loader. At the unloading end, the material was assumed to be pushed by a dozer and compacted with a compactor. A water truck will provide dust suppression at both travel ends. A split of two thirds/one third was assumed between clean and contaminated dirt in the absence of any precise knowledge on travel splits. A 30 mile round trip distance for clean fill disposal was assumed. A 40 mile one-way distance was assumed for contaminated fill disposal before the truck leaves the air basin. The total daily disposal travel distance was estimated as follows:

Clean fill	33 loads x 30 miles/round trip	= 990 miles
Contaminated fill	17 loads x 80 miles/round trip	= 1,366 miles
Total		= 2,350 miles

Peak daily air pollution emissions were calculated by combining emission factors from the SCAQMD construction emissions web site (off-road), and the EMFAC2002 computer model (on-road), and comparing the resulting emissions to the applicable SCAQMD significance thresholds.

Peak daily project related emissions, shown in Table 4, will be below the SCAQMD CEQA significance threshold for all pollutants. NOx emissions will be near the threshold and could exceed the threshold if the bulk of the excavated material is contaminated and must be hauled for longer distances. Both because of the non-attainment status of the air basin and the small margin of NOx safety, reasonably available control measures for NOx emissions are recommended.

Table 4

Maximum Project Construction Activity
Emissions (lb/day)

Construction Sources	Emissions (lb/day)				
	CO	NOx	PM-10	SOx	ROG
Dozers – 6 hours	6.6	17.5	0.7	2.7	1.3
Loader – 4 hours	1.7	4.7	0.3	0.9	0.4
Compactor 2 hours	1.4	14.0	0.2	0.6	0.4
Water trucks - 10 hours	1.7	0.3	<1	<1	0.2
Total Equipment	11.4	26.5	1.2	4.2	2.3
Employee Commute – 5,000 mi.	7.0	0.7	<1	<1	0.7
Fugitive Dust - 2 acres	-	-	2.0	-	-
Haul Trucks – 2,350 mi.	52.5	69.3	1.9	-	6.0
Project Total	70.9	96.5	3.1	4.2	9.0
SCAQMD Threshold	550.	100.	150.	150.	75.
Exceeds (?)	No	No	No	No	No

Source: SCAQMD Web Site (CEQA) for off-road equipment
California ARB MVE17G for on-road sources

MITIGATION

Project-related air pollution emissions during removal of the berm will not exceed SCAQMD CEQA thresholds based upon reasonable assumptions of off-road equipment use and on-road hauling distances. NOx exhaust emissions may, however, approach the threshold. The non-attainment status of the air basin for photochemical smog and the proximity of pollution-sensitive uses near the project site, as well as the possibly small margin of safety for NOx, all suggest that an enhanced level of impact mitigation should be implemented. The recommended matrix of dust and exhaust emissions is as follows:

Fugitive Dust:

- Use low pollutant-emitting construction equipment where/when feasible.
- Use oxidation catalyst equipped diesel-powered equipment if such equipment is economically available.
- Water the construction area twice daily (preferably four times) to minimize fugitive dust.
- Stabilize (for example, hydroseed) graded areas as quickly as possible to minimize dust.
- Implement track-out control as follows:
  - ❖ Apply chemical stabilizer or pave the last 100 feet of internal travel path within a construction site prior to public road entry.
  - ❖ Install wheel washers adjacent to a paved apron prior to vehicle entry on public roads.
  - ❖ Remove any visible track-out into traveled public streets within 30 minutes of occurrence.
  - ❖ Wet wash the construction access point at the end of each workday if any vehicle travel on unpaved surfaces has occurred.
  - ❖ Provide sufficient perimeter erosion control to prevent washout of silty material onto public roads.
- Cover haul trucks or maintain at least 12 inches of freeboard to reduce blow off during hauling.
- Suspend all soil disturbance and travel on unpaved surfaces if winds exceed 25 mph.
- Enforce a 15 mph speed limit on all unpaved surfaces at a construction site.

Equipment NOx Emissions:

NOx emissions may temporarily approach the daily significance threshold. Any off-road equipment operating on the berm-removal site with engine power output exceeding 100 horse-power should be equipped with Tier 3-rated engines that limit combined NOx and ROG emissions to 3.0 grams per horsepower-hour of power output.