

San Bernardino National Forest Motorized Travel Management Project

Air Quality Report

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For:

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Introduction

The San Bernardino National Forest (SBNF) Route Designation project is intended to designate a forest-wide system of routes for public motor vehicle use for the San Bernardino National Forest, as required by the new Travel Management Regulation (Travel Management; Designated, Routes and Areas for Motor Vehicle Use, Federal Register / Vol. 70, No. 216 / Wednesday, November 9, 2005; 36 CFR Parts 212, 251, 261, and 295). The regulation requires that each national forest or ranger district specify the roads, trails, and areas on National Forest lands that are open to motor vehicles, including off highway vehicles (OHV).

This report contains an evaluation of how air resources will be affected by the San Bernardino National Forest Motorized Travel Management project. The document contains policy and direction as well as a discussion of existing air quality conditions and the potential impacts of program implementation under the different alternatives.

Policy and Direction

Federal Laws Relevant to OHV Projects

Federal Clean Air Act

The Federal Clean Air Act (CAA) is the federal law passed in 1970, and last amended in 1990, (42 U.S.C. §7401 et seq.) which is the basis for national control of air pollution. The CAA was designed to “protect and enhance” the quality of the nation’s air resources. Basic elements of the CAA include national ambient air quality standards (NAAQS) for criteria air pollutants, technology based emission control standards for hazardous air pollutants (HAPs), state attainment plans (SIPs), a comprehensive approach to reducing motor vehicle emissions, control standards and permit requirements for stationary air pollution sources, acid rain control measures, stratospheric ozone protection, and enforcement provisions (CARBa, 2007). The U.S. Environmental Protection Agency (U.S. EPA) is the agency responsible for establishing the national ambient air quality standards and for enforcement of the federal Clean Air Act.

The CAA requires that each state develop a State Implementation Plan (SIP), which describes the methods the state will use to ensure that air quality meets the NAAQS for criteria pollutants in nonattainment areas. Criteria air pollutants are defined as those pollutants for which the federal (and state) government has established air quality standards to protect public health, and for some pollutants also have established secondary standards designed to protect the environment (CARBb, 2007). Federal standards relevant to the project are listed in Table 1.

Table 1. National Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standards
Ozone	8-Hour	0.08 ppm
Respirable Particulate Matter (PM ₁₀)	24-Hour	150 µg/m ³
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	.053 ppm
Fine Particulate Matter (PM _{2.5})	24-Hour	35 ug/m ³
	Annual Arithmetic Mean	15 ug/m ³
Carbon Monoxide (CO)	8-Hour	9 ppm
	1-Hour	35 ppm
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	.030 ppm
	24-Hour	.14 ppm

Source: CARB. Accessed online 1/16/2008 at [http:// www.arb.ca.gov/research/aaqs/aaqs2.pdf](http://www.arb.ca.gov/research/aaqs/aaqs2.pdf)

A state or region is given the status of attainment or unclassified if ambient air quality standards have not been exceeded. If an area does not meet the NAAQS for one or more criteria pollutants, the U.S. EPA will designate it as a non-attainment area. States must demonstrate how a non-attainment area will meet the NAAQS, based upon the control of emission sources. Such demonstrations employ control plans that are part of the SIP.

Regional Haze Rule (1990 Clean Air Act Amendments), 40 CFR Part 51.

Fine particles affect visibility by absorbing and scattering light waves when the particles are suspended in the atmosphere, reducing the visual information reaching the eyes of a human observer. Particulate matter pollution (haze) is the major cause of reduced visibility in parts of the United States, including many wilderness areas (Malm, 1999). In 1999, U.S. EPA passed the Regional Haze Rule, which calls for states to establish goals for improving visibility in mandatory Class I areas and to develop long-term strategies for reducing the emissions of air pollutants that cause visibility impairment. The Regional Haze Rule requires states to demonstrate “reasonable progress” toward improving visibility in each Class I area over a sixty-year period (to 2064), during which visibility should be returned to natural conditions. Class I areas include wilderness or National Parks greater than 5000 acres which existed on August 7, 1977. Three Class I wilderness areas are located on the San Bernardino National Forest; the Cucamonga, the San Jacinto and the San Gorgonio. However, since California is still developing their Regional Haze SIP, haze will not be considered further in this document.

General Conformity Rule (1990 Clean Air Act Amendments) (Section 176 (c) of the Clean Air Act (part 51, subpart W, and part 93, subpart B.)

U.S. EPA passed the final General Conformity rule in 1993. Under the rule, federal agencies must work with State and local governments in a nonattainment or maintenance area to ensure that federal actions conform to the initiatives established in the applicable state implementation plan (U.S. EPA, 2008). A project is non-conforming if it conflicts

with or delays implementation of any applicable attainment or maintenance plan. The rule divides the conformity process into two phases: applicability and determination. Federal agencies must first determine if an action is subject to the Conformity Rule (Applicability Analysis) and then if the action conforms to an applicable implementation plan (Conformity Determination). See Appendix A for the Applicability Analysis for this project.

State Laws Relevant to OHV Projects

California Clean Air Act (H&S §§ 39660 et seq.)

California adopted the California Clean Air Act (CCAA) in 1988. The Act provides the basis for air quality planning and regulation in California independent of federal regulations, and establishes ambient air quality standards for the same criteria pollutants as the federal clean air legislation (CARBb, 2007). Under the federal CAA, States can adopt air quality standards that are more stringent than the federal NAAQS. California has chosen to adopt standards for criteria pollutants that are generally more restrictive than the federal standards. The California Air Resources Board (CARB) is the agency responsible for establishing California ambient air quality standards (CAAQS), setting vehicle emission standards and fuel specifications, and regulating emissions from certain types of mobile equipment and consumer products.

Table 2. California Air Quality Standards Pertinent

Pollutant	Averaging Time	State Standards
Ozone	1-hour	0.09 ppm
	8-Hour	0.07 ppm
Respirable Particulate Matter (PM ₁₀)	24-Hour	50 µg/m ³
	Annual Arithmetic Mean	20 µg/m ³
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	0.13 ppm
	1-Hour	0.08 ppm
Fine Particulate Matter (PM _{2.5})	Annual Arithmetic Mean	12 ug/m ³
Carbon Monoxide (CO)	8-Hour	9 ppm
	1-Hour	20 ppm
Sulfur Dioxide (SO ₂)	24-Hour	.04 ppm
	1-Hour	.25 ppm

Source: CARB. Accessed online 1/16/2008 at <http://www.arb.ca.gov/research/aaqs/aaqs2.pdf>

CARB Off-Road Recreational Vehicle Emissions Standards Rulemaking

In 1994, the CARB approved new off-highway recreational vehicle regulations (since amended in 1998). The rulemaking established emission standards for off-highway vehicles (OHVs) including off-road motorcycles (dirt bikes) and all-terrain vehicles (ATVs) (CARBc, 2006). OHV registration became contingent on vehicle compliance to California emissions standards. Dirt bikes and ATVs that meet emission standards are eligible for OHV Green Sticker registration and have a year-round operating period, while noncompliant vehicles fall under the OHV Red Sticker program which has a limited operational season.

Local Regulations

The project is located within the South Coast and Mojave Desert Air Quality Management Districts. Air districts are the local authority and primary agency for managing pollutant emitting activities within their boundaries. The SCAQMD extends across Orange County, most of Los Angeles County, and the western portions of San Bernardino and Riverside counties. The Mojave Desert Air Quality Management District covers the northern portion of eastern San Bernardino County and the eastern portion of Riverside County. Information on air district rules for the SCAQMD is available at <http://www.aqmd.gov/rules/rulesreg.html>, and available at http://www.mdaqmd.ca.gov/rules_plans/rules-plans.htm for the MDAQMD.

South Coast Air Quality Management District Rules

This project is partially located within the South Coast Air Quality Management District (SCAQMD). The SCAQMD is the local authority and primary agency for managing and regulating activities that emit air pollutants, including those emitted by OHV system activities.

Rule 401 - Visible Emissions (Amended 11/09/2001) prohibits discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is: (a) As dark or darker in shade as that designated No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or (b) of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subsection (a) of the rule.

Rule 403 – Fugitive Dust (Amended 5/03/2005) is intended to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (man-made) fugitive dust sources. It prohibits the emissions of fugitive dust such that the dust remains visible in the atmosphere beyond the property line of the emission source or that dust emissions exceed 20 percent opacity, if the dust emission is the result of movement of motorized vehicle. It also requires that a person utilize the best available control measures to minimize fugitive dust emissions from each type of source that is part of the active operation.

Rule 1186 – PM₁₀ Emissions from Paved and Unpaved Roads, and Livestock Operations (Amended 4/2/ 2004) The purpose of this rule is to reduce the amount of particulate matter entrained in the ambient air as a result of vehicular travel on paved and unpaved public roads, and at livestock operations, and establishes the conditions under which such roads should be operated and maintained.

Mojave Desert Air Quality Management District Rules

Rule 401 - Visible Emissions (Adopted 7/25/1977) prohibits discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is: (a) As dark or darker in shade as that designated No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or(b) of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subsection (a) of the rule.

Rule 403 - Fugitive Dust (Adopted 7/25/1977) requires every reasonable precaution to minimize fugitive dust emissions from wrecking, excavation, grading, clearing of land and solid waste disposal operations.

Air Quality Management District Significance Criteria

Both the South Coast and the Mojave Desert AQMDs have established air quality significance thresholds against which a project can judge its initial impacts to air quality against state requirements. A project is significant if it generates total emissions (direct and indirect) in excess of the air district thresholds. Table 2 displays the significance criteria for both the SCAQMD and the MDAQMD.

Table 3. AQMD Air Quality Significance Criteria

	Reactive Organic Gases (lbs/day)	Nitrogen Oxides (NO ₂ /NO _x) (lbs/day)	PM ₁₀ (lbs/day)	PM _{2.5} (lbs/day)	Carbon Monoxide (CO) (lbs/day)	Sulfur Oxides (SO ₂ /SO _x) (lbs/day)
South Coast AQMD ¹	55	55	150	55	550	150
Mojave Desert AQMD ²	137	137	82	n/a	548	137

¹ Source: SCAQMD CEQA HB. Accessed on 1/16/08 <http://www.aqmd.gov/ceqa/handbook/signthres.pdf>

² Source: MDAQMD CEQA Guidelines. Accessed on 1/16/08 http://www.mdaqmd.ca.gov/rules_plans/documents/CEQAGuidelines.pdf

San Bernardino National Forest Plan Direction

Table 3 displays the San Bernardino Land and Resource Management Plan Standards and Guidelines for air quality (USDA Forest Service, 2005) pertinent to the Route Designation project.

Table 4. San Bernardino Land Management Plan Program Strategies and Tactics

Program Strategies	Tactics
<p>Air 1 Minimize Smoke and Dust – Control and reduce smoke and fugitive dust to protect human health, improve safety and/or reduce or eliminate environmental impacts</p>	<ul style="list-style-type: none"> • Incorporate visibility requirements into project plans • Use emissions reduction techniques (ERT).
<p>Air 2 Forest Air Emissions – Maintain and update the inventory for wildland fire emissions and other national forest resource management emissions within the current SIP. The SIP inventories establish levels of air pollution that meet the long-term federal air quality goals for bringing the nonattainment area to attainment of the National Ambient Air Quality Standards</p>	<ul style="list-style-type: none"> • Describe the magnitude and timing of prescribed and wildland fire emissions in each Air Pollution Control District • Provide input to AQMD on regional air quality issues for forest protection.

Source: San Bernardino LRMP. Accessed on 2/16/08 at <http://www.fs.fed.us/r5/sanbernardino/projects/lmrp.shtml>

Existing Condition

The South Coast Air Quality Management district is officially defined as bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino and San Jacinto Mountains to the north and east. It includes all of Orange County and portions of Los Angeles, Riverside, and San Bernardino counties. The Mojave Desert Air Basin includes the eastern half of Kern County, the northern part of Los Angeles County, most of San Bernardino County except for the southwest corner, and the eastern edge of Riverside County. It is separated from the South Coast Air Basin by the San Gabriel and San Bernardino Mountains (Austin and Gouze, 2001).

Figure 1. Air Quality Management Districts of Southern California



Climate and Air Quality

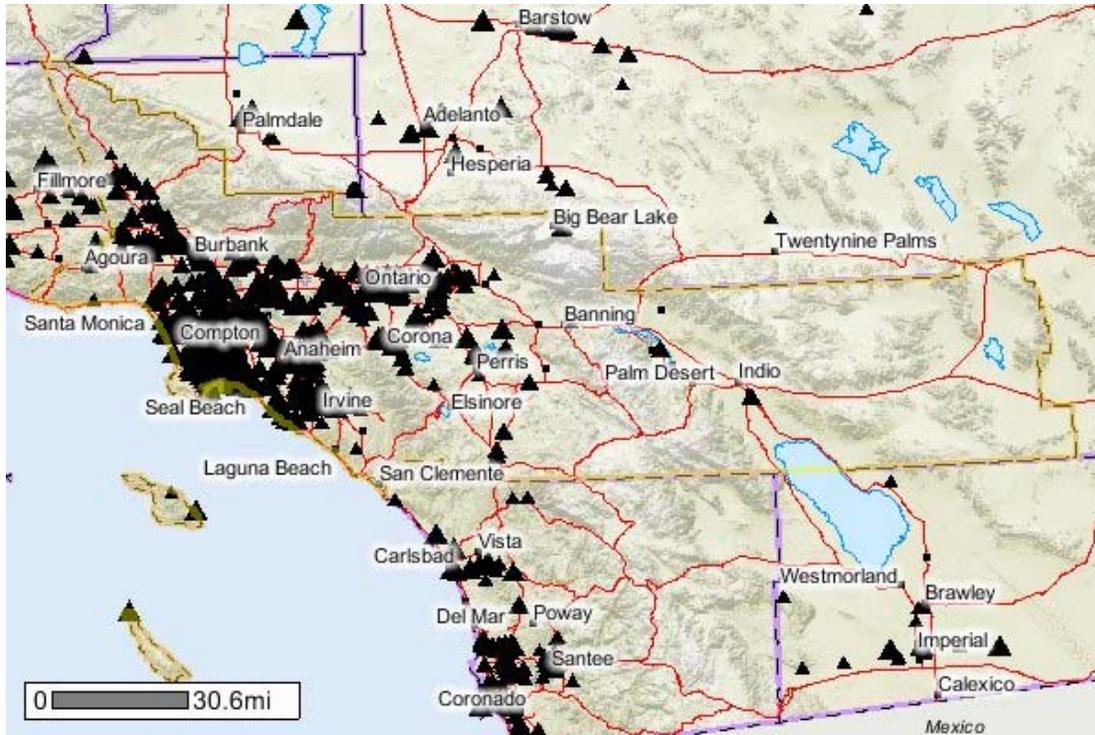
The population density, topography, and climate of the South Coast AQMD make it an area of high air pollution potential. The coastal area of the District (known as the South Coast Air Basin) is characterized by a Mediterranean climate with dry summers, wet winter, and mild seasonal changes. Temperatures are normally mild with rare extremes above 100°F or below freezing. The climate in the eastern portion of the Air District (known as the Salton Sea Air Basin) is classified as continental desert (SCAQMD, 2007). The Salton Sea Air Basin is separated from the South Coast Air Basin by the San Jacinto Mountains and from the Mojave Desert Air Basin to the east by the Little San Bernardino Mountains. The desert portion of the District is characterized by hot, dry summers, mild winters, frequent gusty winds, with annual rainfall averaging 2 to 5 inches per year. During the summer months, temperatures can reach 110* F. The rainfall pattern for the entire SCAQMD is seasonal with most rain falling between November and April. The SSAB portion of the District is also affected by the southwest monsoon, which drives tropical moisture into the desert in the form of thunderstorms.

The coastal region of the Air District contains the densest urban area in the western U.S. (CARBd, 2006). Air quality in the coastal zone is driven almost entirely by local emissions, and air quality problems are exacerbated by high population density, topography, and local meteorological conditions (Austin and Gouze, 2001). During late spring, summer and early fall, light winds, low mixing heights, and sunshine combine to produce conditions favorable for the production of ozone (Orange County, 2006). In the winter, the greatest pollution problems are carbon monoxide and oxides of nitrogen because of extremely low level inversions and air stagnation during the night and early morning hours (Orange County, 2006). Elevated PM₁₀ and PM_{2.5} concentrations can occur throughout the year, but are most common in the fall and winter months (SCAQMD, 2007). Prevailing winds that travel west to east transport pollutants from the heavily populated coastal zone through the Banning pass into the Coachella Valley (SCAQMD, 2007). .

The Mojave Desert Air Quality Management District covers a large part of California's high desert. The MDAQMD is classified as hot desert, with very cold temperatures during the winter months to very hot temperatures (over 100°F) during the summer. The district averages between three and seven inches of precipitation per year, with most of the rainfall occurring between November and April (MDAQMD, 2007). The area is sparsely populated, with military bases, highways and railroad facilities, cement manufacturing and mineral processing as the main local sources of air pollutants. Prevailing winds in the MDAB are out of the west and southwest. Air quality in the district is heavily impacted by transport from the South Coast and the San Joaquin air basins (CARBd, 2006).

The general distribution of criteria pollutant emission sources contributing to air quality in the project area can be seen in figure 2. The South Coast AQMD is bordered in yellow, with the Mojave Desert AQMD located directly to the north.

Figure 2. Distribution of Emission Sources in Southern California



Source: California Air Resources Board CHAPIS

Emissions

Within the South Coast AQMD, a majority of the pollution is derived from the nearby urban areas. The largest source of carbon monoxide (CO), nitrogen oxides (NO_x) and reactive organics gases (ROG) in the South Coast Air Basin are on-road motor vehicles (CARB, 2005). Major sources of particulates (PM₁₀ and PM_{2.5}) include miscellaneous processes that include activities such as construction, dust from paved and unpaved roads, fugitive dust, automobiles, waste burning, fuel combustion, cooking, industrial processes, and agricultural activities,. Emissions (daily annual average) for the major pollutants in the SCQMD are listed below in Table 6.

SCAQMD emissions from recreational off-road vehicles range from .02-1.13%, a very small portion of total criteria pollutant emissions in the District. Travel on unpaved roads accounts for 3.7% of PM₁₀ emissions, and 1% of PM_{2.5} emissions respectively, while travel on paved roads accounts for 44% of PM₁₀ and 18% of PM_{2.5}.

Table 5. 2008 Projected Emissions for the SCAQMD

Source Type	VOC (tpd)	CO (tpd)	NO _x (tpd)	SO _x (tpd)	PM ₁₀ (tpd)	PM _{2.5} (tpd)
Fuel Combustion	7.16	53.44	29.57	2.38	6.32	6.26
Waste Disposal	7.57	1.05	1.85	0.42	0.47	0.45
Cleaning and Surface Coatings	37.09	0.21	0.15	0.02	0.74	0.71
Petroleum Production and Marketing	31.6	8.81	0.41	1.11	0.91	0.72
Industrial Processes	19.39	2.63	0.21	0.05	8.66	4.82
Solvent Evaporation	127.14	n/a	n/a	n/a	0.02	0.02
Mobile Sources-on road	210.35	2115.74	435.34	2.1	21.9	17.75
Mobile Sources-other	145.71	964.77	331.4	22.13	20.66	18.52
Mobile Sources-off road recreational	6.85	15.89	0.16	0.04	0.05	0.04
Miscellaneous Processes	15.13	111.26	54.61	12.62	82.16	32.73
Misc-unpaved road dust	n/a	n/a	n/a	n/a	10.31	1.02
Misc-paved road dust	n/a	n/a	n/a	n/a	122.28	18.46
Total Anthropogenic	607.99	3273.8	853.7	40.87	277.48	101.5

Source: SCAQMD 2007 AQMP. Accessed on-line 2/5/08 at <http://www.aqmd.gov/aqmp/07aqmp/index.html>

Recreational off-road vehicles in the Mojave Desert Air Basin account for 15% of VOC and 6% of CO emissions, while also producing .084-1.52% of NO_x, SO_x, PM₁₀ and PM_{2.5}. Travel on unpaved roads accounts for 38.6% of PM₁₀ emissions, and 22.9% of PM_{2.5} emissions, while travel on paved roads accounts for 8.3% of PM₁₀ and 4.5% of PM_{2.5}.

Table 6. 2006 Emissions for the Mojave Desert Air Basin

Source Type	VOC (tpd)	CO (tpd)	NO _x (tpd)	SO _x (tpd)	PM ₁₀ (tpd)	PM _{2.5} (tpd)
Fuel Combustion	0.85	6.73	16.49	0.48	4.76	3.64
Waste Disposal	0.25	0.01	0.01	n/a	0.2	0.05
Cleaning and Surface Coatings	0.11	0.01	n/a	n/a	0.23	0.22
Petroleum Production and Marketing	5.49	n/a	0.02	n/a	n/a	n/a
Industrial Processes	1.99	20.63	46.46	5.03	17.85	7.73
Solvent Evaporation	11.06	n/a	n/a	n/a	n/a	n/a
Mobile Sources-on road	31.68	n/a	n/a	n/a	n/a	5.61
Mobile Sources-other	20.11	88.21	63.21	3.5	5.82	5.5
Mobile Sources-recreational off road	14.45	31.42	0.32	0.16	0.15	0.11
Miscellaneous Processes	4.27	25.32	2.17	0.09	58.27	11.63
Misc-unpaved road dust	n/a	n/a	n/a	n/a	68.74	11.14
Misc-paved road dust	n/a	n/a	n/a	n/a	14.84	2.23
Total Anthropogenic	96.28	475.55	286.13	10.46	178.31	48.52

Source: CARB. Accessed on-line 2/18/08 at <http://www.arb.ca.gov/app/emsinv/emssumcat.php>

National and State Ambient Air Quality Standards

The project area is nonattainment for both State and Federal ambient air quality standards for several criteria air pollutants. Pertinent air quality designations are shown in Table 4.

Table 7. Air Quality Designations for South Coast and Mojave Desert Air Districts

Air Quality Management District	County/Area	Criteria Pollutant	Federal Nonattainment Status ¹	State Nonattainment Status ²
South Coast	South Coast Air Basin	CO	Maintenance (serious)	Attainment
South Coast	Riverside/San Bernardino	Ozone	Severe/Serious (Coachella Valley)	Extreme
Mojave Desert	San Bernardino	Ozone	Moderate	Moderate
South Coast	Riverside/San Bernardino	PM ₁₀	Serious	Nonattainment (Coachella Valley Unclassified)
Mojave Desert	San Bernardino	PM ₁₀	Serious	Nonattainment (Coachella Valley Unclassified)
South Coast	Riverside/San Bernardino	PM _{2.5}	Nonattainment	Nonattainment
Mojave Desert	San Bernardino	PM _{2.5}	Nonattainment	Nonattainment

¹ Source: U.S. EPA: Criteria Pollutant Area Summary Report (Green Book). Accessed on-line 1/16/08 at <http://www.U.S.EPA.gov/oar/oaqps/greenbk/astate.html>

² Source: CARB. Accessed on-line 1/16/08 at <http://www.arb.ca.gov/desig/adm/adm.htm>

Environmental Consequences

Analysis of Alternatives

For purposes of meeting federal requirements, impact significance is related to federal conformity with the U.S. EPA-approved SIP and with the NAAQS. Air quality impacts would be considered significant if they are expected to cause or contribute to an air quality violation in a nonattainment or maintenance area. However, if total direct and indirect project emissions fall below designated Applicability threshold levels established under the Conformity Rule (Appendix A), no adverse change in attainment status is expected. For purposes of meeting state requirements, AQMD thresholds of significance for project emissions serve the same purpose as the federal Applicability thresholds.

Effects Common to All Alternatives

Off highway vehicles emit criteria pollutants such as nitrogen oxides, sulfur oxides, carbon monoxide, and volatile organic compounds (VOCs) (Ouren and others, 2007). Both NO_x and VOCs are the precursors for the nonattainment pollutant O₃. OHV exhaust and travel on unpaved roads and trails emits particulate matter. Inhalable coarse particles (PM₁₀) are emitted directly from the source; such as soot from engine exhaust, windblown dusts from bare soil, and reentrained dust from vehicle travel on unpaved roads. Fine particles (PM_{2.5}) are associated with the products of engine exhaust including the reaction of NO_x and SO₂ with ammonia and diesel soot (SCQMD, 2007). Inhalable particulate matter poses a serious health hazard, since it can be deposited in the lungs and can cause permanent damage by interfering with the body's mechanism for clearing the respiratory tract or by acting as a carrier of a toxic substance (SCAQMD, 2007). Dust from OHV can directly reduce plant photosynthesis near roads and trails by coating needles and leaves (Ouren and others, 2007). PM_{2.5} is the major cause of reduced visibility in Southern California, including in National Forest Class I wilderness areas (U.S. EPA, 2007). The OHV travel routes lie to the south and east of the Cucamonga, to the north of the San Geronio, and west of the San Jacinto Class I wilderness areas.

Both the No Action and the Action alternatives will release PM₁₀/PM_{2.5} into the environment from recreational vehicle travel on forest roads and trails, as well as road and trail system rehabilitation and maintenance projects. Tailpipe emissions from motorized equipment will produce criteria pollutants such as carbon monoxide, as well as the precursor gases for ozone and PM_{2.5}.

Alternatives

Direct and Indirect Effects

The number of vehicle visits to the San Bernardino National Forest ranges from a minimum of 32,000 to a maximum of 35,000 per year. The average trip length per visit is estimated at 42 miles. The number of vehicle miles travelled (VMT) on the Forest ranges from approximately 1,344,000 to 1,470,000 miles annually. Street legal and 4WD vehicles account for 31%, motorcycles for 29%, ATVs for 25%, and other vehicle types for 15% of annual visits. The number of annual vehicle visits is expected to remain constant for all alternatives; however, there may be some alterations to use patterns due to changes in road and trail status.

Two possible air quality scenarios exist for the action alternatives. The first scenario envisions that the total number of vehicle miles travelled annually for recreational use would be responsive to the number of trail miles that are open to the public. The annual VMT may decrease in proportion to the number of trail miles removed from the system through targeted closures or through rehabilitation. Vehicle and entrained fugitive dust emissions would in turn be expected to decrease. Accessible trail miles are expected to decline for all action alternatives.

Table 8. Accessible Road & Trail Miles by Alternative

Location	Action	Alternative 1A Miles (+/-)	Alternative 3 Miles (+/-)	Alternative 4 Miles (+/-)
Mojave Desert	Net Change user miles	-58.76	-45.80	-60.44
South Coast	Net Change user miles	-47.97	-20.35	-52.88
SBNF	Net Change user miles	-106.73	-66.15	-113.32

The second potential outcome is that the total annual number of vehicle miles travelled remains unaltered despite any system changes, since users may instead choose to reroute onto remaining roads and trails. There is not enough information available at the present time to determine which outcome is the most likely. Therefore, both possible scenarios will be evaluated for their air quality effects.

As can be seen in Table 9, annual criteria pollutant emissions would decrease for all of the action alternatives if VMT decreased (Alternatives 1A, 3, and 4), and would continue unchanged if the annual VMT remained static (as in Alternative 2). In no instance, however, would emissions be expected to increase for either the Mojave Desert or the South Coast Air Districts.

Table 9. Annual Operational Emissions by Alternative

Alternative	Location	VOC (tpy)	CO (tpy)	NO _x (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	SO _x (tpy)
Alt 1A	Mojave Desert	0.58	8.48	0.15	75.01	15.92	0.000577
	South Coast	1.60	23.17	0.41	204.97	43.49	0.001576
	SBNF	2.18	31.65	0.55	279.98	59.40	0.002152
Alt 2 (no action)	Mojave Desert	0.75	10.88	0.19	96.26	20.42	0.000740
	South Coast	1.73	25.13	0.44	222.31	47.17	0.001709
	SBNF	2.48	36.01	0.63	318.57	67.59	0.002449
Alt 3	Mojave Desert	0.62	9.01	0.16	79.70	16.91	0.000613
	South Coast	1.67	24.30	0.43	214.95	45.61	0.001652
	SBNF	2.30	33.31	0.58	294.65	65.52	0.002265
Alt 4	Mojave Desert	0.58	8.41	0.15	74.41	15.79	0.000572
	South Coast	1.58	22.97	0.40	203.19	43.11	0.001562
	SBNF	2.16	31.38	0.55	277.60	58.89	0.000000

Under each of the action alternatives, selected routes (both roads and unauthorized trails) would be closed to vehicle travel and restored to a natural condition using a combination of techniques such as soil decompaction with heavy equipment, reseeding, planting, and placement of barriers including boulders, fencing and slash. The use of heavy equipment and worker vehicles will produce exhaust emissions, while travel on unpaved roads will produce fugitive dust. Approximately 70% of the routes would be rehabilitated using mobile equipment, while the remainder would be protected by barriers and allowed to revegetate naturally. Seventeen miles will be treated during the first year, with approximately five miles undergoing restoration each year thereafter.

Table 10. Total Rehabilitation Miles by Alternative

Location	Alternative 1A Miles	Alternative 3 Miles	Alternative 4 Miles
Mojave Desert	61.90	59.62	61.90
South Coast	40.64	38.06	42.97
SBNF	102.54	97.68	104.87

Emissions produced during the rehabilitation and revegetation phase would be localized and temporary in nature. Total emissions for all road and trail closure projects are summarized in Table 11.

Table 11. Total Trail Rehabilitation and Road Decommissioning Project Emissions

Alternative	CO (tons)	VOC (tons)	NO _x (tons)	PM ₁₀ (tons)	PM _{2.5} (tons)	SO _x (tons)
Alt 1A Mojave Desert	0.179	0.056	0.548	0.728	0.182	0.056
Alt 1A South Coast	0.118	0.037	0.360	0.476	0.119	0.035
Alt 3 Mojave Desert	0.173	0.054	0.528	0.700	0.175	0.060
Alt 3 South Coast	0.110	0.034	0.337	0.448	0.112	0.035
Alt 4 Mojave Desert	0.179	0.056	0.548	0.728	0.182	0.060
Alt 4 South Coast	0.124	0.039	0.381	0.504	0.126	0.042

Over time, a net air quality benefit could occur due to route closure and rehabilitation projects. Long term declines in fugitive dust emissions would be expected as vegetation reclaims formerly exposed roads and trail surfaces.

Cumulative Effects

Potential cumulative impacts of the proposed project in conjunction with other present or reasonably foreseeable probable actions are the focus of this section. The actions analyzed for potential cumulative impacts includes all proposed activities occurring to forest roads and trails considered under the San Bernardino National Forest Route Designation program. The project is expected to have limited cumulative impacts to air quality. Overall, vehicle and fugitive dust emissions are expected to remain stable or decrease. Road and trail rehabilitation will create localized, temporary increases in fugitive dust and emissions from motorized equipment. However, once the restoration projects are complete, fugitive dust emissions from vehicle travel on unauthorized routes will decrease.

Conclusions

The project demonstrates conformity with the State Implementation Plan under the Federal Clean Air Act (CAA), and does not exceed either the SCAQMD or the MDAQMD daily project emissions significance thresholds for any alternative. No adverse change in attainment status is expected to occur as a result of this project.

References

- Austin, J., Gouze, S. 2001. Ozone Transport: 2001 Review. California Environmental Protection Agency Air Resources Board Planning and Technical Support Division. Web site: www.arb.ca.gov/aqd/transport/summary/transportsummary.doc. Accessed January 16, 2008.
- California Air Resources Board (a). 2007. The Federal Clean Air Act. Web site <http://www.arb.ca.gov/fcaa/fcaa.htm>. Accessed January 14, 2008.
- California Air Resources Board (b). 2007. Glossary of Air Pollution Terms. Web site: <http://www.arb.ca.gov/html/gloss.htm>). Accessed January 15, 2008.
- California Air Resources Board (c). 2006. Off-road Recreation Vehicle Background. Web site: <http://www.arb.ca.gov/msprog/offroad/orrec/background.htm>. Accessed January 15, 2008.
- California Air Resources Board, 2006 (d). California Air Basins General Information. Web site: <http://www.arb.ca.gov/knowzone/basin/basin.htm>. Accessed January 16, 2008.
- Malm, W.C. 1999. Introduction to Visibility. Web site: <http://www.U.S.EPA.gov/air/visibility/pdfs/introvis.pdf>. Accessed January 15, 2008.
- Mojave Desert AQMD. 2007. California Environmental Quality Act (CEQA) and Federal Conformity Guidelines. http://www.mdaqmd.ca.gov/rules_plans/documents/CEQAGuidelines.pdf. Accessed January 16, 2008.
- Orange County. 2006. General Plan Resources Element. Web site: <http://library.ceres.ca.gov/docs/data/0900/910/HYPEROCR/hyperocr.html>. Accessed January 17th, 2008.
- Ouren, D., Haas, C., Melcher, C., Stewart, S., Ponds, P., Sexton, N., Burris, L., Fancher, T., Bowen, Z. 2007. Environmental Effects of Off-Highway Vehicles on Bureau of Land Management Lands: A Literature Synthesis, Annotated Bibliographies, Extensive Bibliographies, and Internet Resources. U.S. Geological Survey Open-File Report 2007-1353. Web site: www.fort.usgs.gov/Products/Publications/pub_abstract.asp?PubID=22021. Accessed January 16, 2008.
- South Coast AQMD. 2007. 2007 Air Quality Management Plan. Web site: <http://www.aqmd.gov/aqmp/07aqmp/index.html>. Accessed January 16, 2008.

USDA Forest Service. 2005. San Bernardino National Forest Land and Resource Management Plan, Pacific Southwest Region, San Bernardino, CA. Web site: <http://www.fs.fed.us/r5/sanbernardino/projects/lmrp.shtml>. Accessed January 14, 2008.

U.S. Environmental Protection Agency. 2007. Particulate Matter. Web site: <http://www.U.S.EPA.gov/air/particlepollution/>. Accessed January 15, 2008.

U.S. Environmental Protection Agency. 2008. General Conformity. Web site: <http://www.U.S.EPA.gov/oar/genconform/>. Accessed January 15, 2008.

Appendix A

General Conformity Applicability Analysis

The purpose of this analysis is to determine if the San Bernardino National Forest Route Designation project meets the requirements of the General Conformity Rule, which was established under the [Clean Air Act \(section 176\(c\)\(4\)\)](#). Under the rule, federal agencies must ensure that their actions conform to the requirements established in the applicable State Implementation Plan (SIP). The SIP outlines the steps each State and its local Air Districts must follow in order to ensure that air quality meets the National Ambient Air Quality Standards (NAAQS). Ambient air quality standards have been set by the federal government for ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter (PM₁₀ and PM_{2.5}), and lead (Pb). The rule applies only to areas that are in nonattainment or maintenance status for the NAAQS.

The General Conformity Rule divides the conformity assessment process into two distinct phases; Applicability and Determination. Federal agencies must first determine if an action is subject to the Conformity Rule (Applicability). If total direct and indirect project emissions are below predetermined “de minimus” emission thresholds (40 CFR 93.153) and if the project emissions represent less than 10% of an area’s total emissions for each criteria pollutant; the proposed action would be exempt from performing a comprehensive Air Quality Conformity Determination and the action would be presumed to conform with the SIP. In cases where a permit or condition of use is being renewed or modified for federal lands, it is the change in total project emissions from the initial or existing condition to the new or modified conditions that requires analysis. Federal actions that exceed the Applicability values usually require further analysis in the form of a Conformity Determination.

Direct and indirect emissions caused by the San Bernardino National Forest Route Designation project will include fugitive dust from vehicle travel on forest roads and trails; fugitive dust caused by soil disturbing system maintenance and rehabilitation activities; and exhaust emissions from recreational vehicles and administrative users, as well as national forest road and trail system maintenance equipment.

Particulate emissions in the form of dust occur when vehicles travel on unpaved roads and trails. Dust is lifted and dropped from the rolling wheels and also lifted by the turbulence caused by tire rotation. The amount of particulate matter emitted varies with the amount, weight, and speed of traffic, the silt content of the road surface, and weather conditions. Particulate matter is produced during soil disturbing activities such as road and trail maintenance and may also be emitted directly in vehicle exhaust, or created by secondary formation processes from the precursor gases (such as SO₂) emitted by internal combustion engines. Exhaust emissions include other SCAQMD nonattainment pollutants such as carbon monoxide; as well as the ozone precursor gases volatile organic compounds and nitrogen oxides, which combine in the presence of heat and light to form O₃.

De Minimis Analysis

Annual project emissions (direct and indirect) of nonattainment pollutants and their precursor gases were calculated to determine General Conformity rule applicability.

Table 1 below shows the annualized project emissions and compares them to the de minimis levels in the General Conformity rule. Since most alternatives resulted in an emissions decrease (with the exception of Alternative 3), the majority of values below represent only rehabilitation project emissions. In the case of Alternative 3 for the Mojave Air District, both rehabilitation and annual operational emissions are included. No de minimis thresholds are exceeded for any alternative for either the SCAQMD or the MDAQMD.

Table 12. SCAQMD and MDAQMD De Minimis Analysis

Alternative	CO (tons)	VOC (tons)	NO _x (tons)	SO _x (tons)	PM ₁₀ (tons)	PM _{2.5} (tons)
SCAQMD Nonattainment Status	Serious NA	O ₃ severe NA	O ₃ severe NA	PM _{2.5} NA	Serious NA	NA
MDAQMD Nonattainment Status	Attainment	O ₃ moderate NA	O ₃ moderate NA	Attainment	Serious NA	NA
Alt 1A Mojave Desert	0.179	0.056	0.548	0.056	0.728	0.182
Alt 1A South Coast	0.118	0.037	0.36	0.035	0.476	0.119
Alt 3 Mojave Desert	0.173	0.054	0.528	0.06	0.7	0.175
Alt 3 South Coast	0.11	0.034	0.337	0.035	0.448	0.112
Alt 4 Mojave Desert	0.179	0.056	0.548	0.06	0.728	0.182
Alt 4 South Coast	0.124	0.039	0.381	0.042	0.504	0.126
SCAQMD De minimis threshold (tpy)	100	25	25	100	70	100
MDAQMD De minimis threshold (tpy)	n/a	100	100	100	70	100
Exceeds?	No	No	No	No	No	No

Because total rehabilitation project emissions would be less than the General Conformity rule applicability levels, the project would be presumed to conform with the SIP.

Regional Significance Analysis

Even if the total direct and indirect emissions for a criteria pollutant in a nonattainment or maintenance area are below de minimis levels, the action must still be evaluated for regional significance. Regionally significant emissions are defined as emissions representing 10% or more of the total emissions of each individual pollutant for the region (in this case the South Coast and Mojave Desert AQMDs). If the total direct and indirect emissions from the project are not regionally significant, the action is presumed to conform to the SIP. Table 13 presents the General Conformity regional significance thresholds analysis.

Estimated emissions are below the 10% regional threshold level for both the SCAQMD and MDAQMD.

Table 13. SCAQMD and MDAQMD Annual Project Emissions Regional Thresholds Analysis

Alternative	VOC (tons)	CO (tons)	NO _x (tons)	SO _x (tons)	PM ₁₀ (tons)	PM _{2.5} (tons)
Alt 1A Mojave Desert	0.056	0.179	0.548	0.056	0.728	0.182
Alt 1A South Coast	0.037	0.118	0.36	0.035	0.476	0.119
Alt 3 Mojave Desert	0.054	0.173	0.528	0.06	0.7	0.175
Alt 3 South Coast	0.034	0.11	0.337	0.035	0.448	0.112
Alt 4 Mojave Desert	0.056	0.179	0.548	0.06	0.728	0.182
Alt 4 South Coast	0.039	0.124	0.381	0.042	0.504	0.126
SCAQMD Emissions-2008	221,916	1,194,937	311,601	14,918	101,280	37,048
SCAQMD 10% Threshold	22,192	119,494	31,160	1,492	10,128	3,705
MDAQMD Emissions-2006	35,142	173,576	104,437	3,818	65,083	17,710
MDAQMD 10% Threshold	3,514	17,358	10,448	382	6,508	1,771
Exceeds?	No	No	No	No	No	No

Air District Significance Thresholds Analysis

Each Air Pollution Control District establishes the maximum total daily emissions that can be emitted from a project without requiring a detailed air quality analysis and/or mitigation. Table 14 compares total rehabilitation project emissions to the SCAQMD and MDAQMD significance thresholds. Emissions fall well below the district thresholds.

Table 14. SCAQMD and MDAQMD Daily Significance Thresholds Analysis

Alternative	CO (lbs/day)	VOC (lbs/day)	NO _x (lbs/day)	SO _x (lbs/day)	PM ₁₀ (lbs/day)	PM _{2.5} (lbs/day)
Alt 1A Mojave Desert	3.58	1.12	10.96	1.12	14.56	3.64
Alt 1A South Coast	2.36	0.74	7.2	0.7	9.52	2.38
Alt 3 Mojave Desert	3.46	1.08	10.56	1.2	14	3.5
Alt 3 South Coast	2.2	0.68	6.74	0.7	8.96	2.24
Alt 4 Mojave Desert	3.58	1.12	10.96	1.2	14.56	3.64
Alt 4 South Coast	2.48	0.78	7.62	0.84	10.08	2.52
SCAQMD Significance Thresholds (lbs/day)	550	75	55	150	150	55
MDAQMD Significance Thresholds (lbs/day)	548	137	137	137	82	n/a
Exceeds?	No	No	No	No	No	No

Conclusion

The proposed action has been analyzed as required under section 176(c) of the federal Clean Air Act, as amended, and 40 CFR 93.156 and has been determined to conform to the applicable State Implementation Plan for the purpose of attaining and maintaining all National Ambient Air Quality Standards. No further air quality analysis is required.

