

Air Quality General Conformity Evaluation

April 11, 2012

**Bureau of Land Management
Lower Sonoran and Sonoran Desert National Monument
Resource Management Plan and
Environmental Impact Statement**

Prepared for the Bureau of Land Management
by ICF International

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ACRONYMS AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
AUM	animal unit month
BLM	Bureau of Land Management
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ERMA	Extensive Recreation Management Area
LSDA	Lower Sonoran Decision Area
LUA	land use authorization
NAA	nonattainment area
NAAQS	National Ambient Air Quality Standards
NHT	National Historic Trail
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
OHV	off-highway vehicle
PM	particulate matter
RMA	Recreation Management Area
RMP	Resource Management Plan
RMZ	Recreation Management Zone
ROW	right-of-way
SDNM	Sonoran Desert National Monument
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SRMA	Special Recreation Management Area
UL	Undesignated Land
U.S.C.	United States Code
VOC	volatile organic compound
VRM	Visual Resource Management

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I. INTRODUCTION

This report describes the evaluation of actions and activities proposed under the Bureau of Land Management (BLM) Lower Sonoran and Sonoran Desert National Monument (SDNM) Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (EIS) revision project for conformance with the applicable air quality plans. The Lower Sonoran and SDNM RMP, when approved, will provide management direction for the lands managed by the BLM Lower Sonoran Field Office in south central Arizona. These lands are referred to as the Planning Area in this document. The Planning Area is divided into two Decision Areas: the SDNM Decision Area, which includes all public lands in the SDNM, and the Lower Sonoran Decision Area (LSDA), which includes all public lands within the Planning Area outside the SDNM. This report describes air pollutant emission estimates for both Decision Areas for the Proposed RMP (Alternative E).

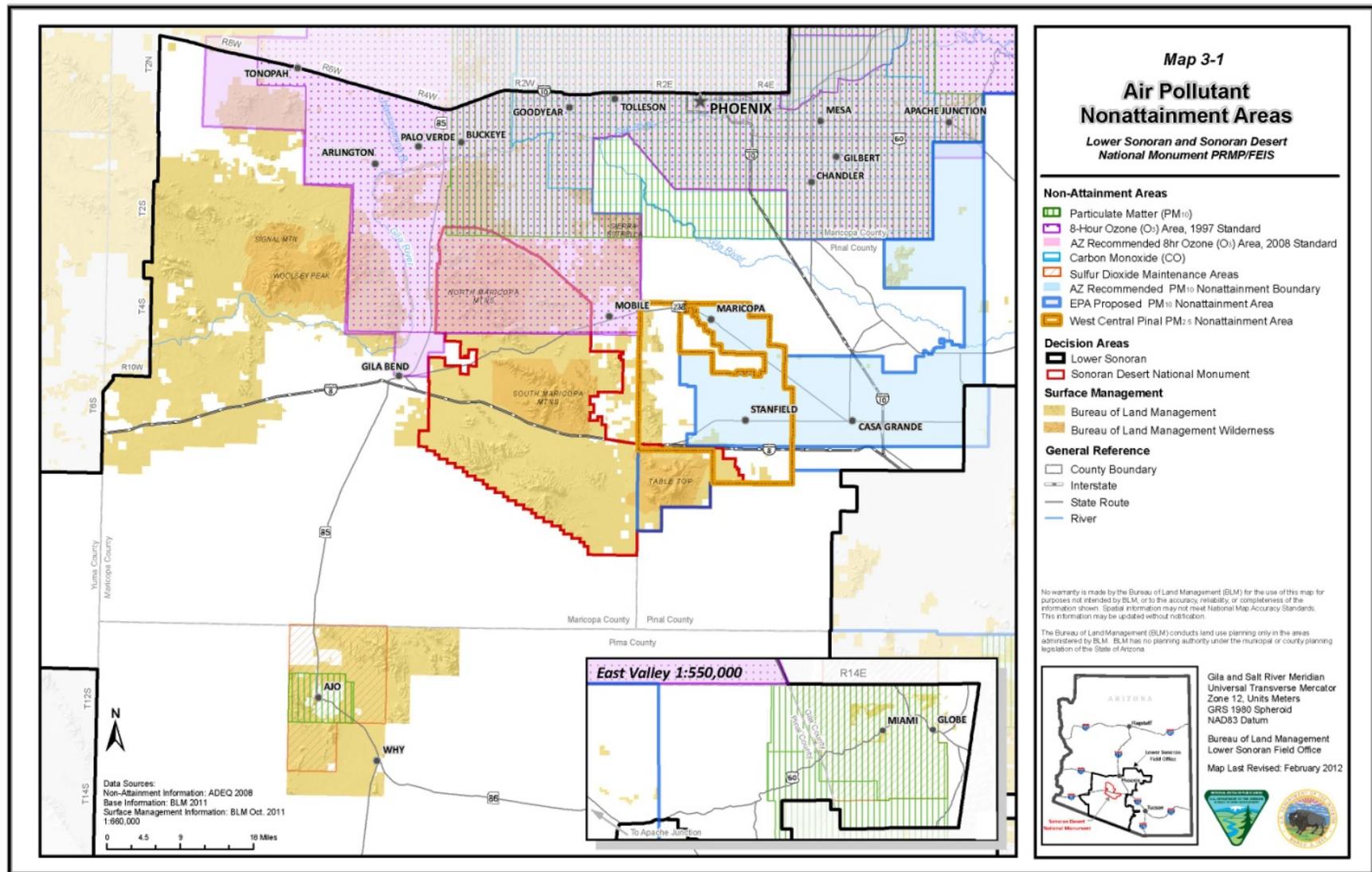
To reduce air pollution levels, the Federal Government and state agencies passed legislation and established regulatory programs to control sources of pollutant emissions. The Clean Air Act (CAA) (42 United States Code [U.S.C.] §7401 et seq.) is the primary Federal legislation that addresses air quality. Under the authority of the CAA and its amendments, the U.S. Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) (40 Code of Federal Regulations [CFR] 50) for six relatively common air pollutants – known as “criteria” pollutants because EPA regulates them by developing human-health-based or environmentally-based criteria for setting permissible concentrations. The criteria pollutants are carbon monoxide (CO), lead, nitrogen dioxide (NO₂), ozone, particulate matter (PM) with an aerodynamic diameter equal to or less than 10 microns (PM₁₀, or coarse particles) and 2.5 microns (PM_{2.5}, or fine particles), and sulfur dioxide (SO₂). Ozone is not emitted directly, but is formed from emissions of the ozone precursor pollutants nitrogen oxides (NO_x) and volatile organic compounds (VOCs). For further information on the criteria pollutants and sources of emissions, see the Air Quality section in Chapter 3 of the Lower Sonoran and SDNM Proposed RMP and EIS.

Under the CAA, EPA designates geographic areas as “attainment” if pollutant concentrations are within the NAAQS, “nonattainment” if pollutant concentrations exceed the NAAQS or “unclassifiable” if available monitoring data are insufficient to assign an attainment status. Former nonattainment areas that have achieved compliance with the NAAQS are designated as “maintenance” areas. Each state with a nonattainment area is required to develop and implement a State Implementation Plan (SIP) documenting how the area will reach attainment within periods specified in the CAA. For maintenance areas, the SIP must document how the state intends to maintain compliance with the NAAQS. When EPA changes an NAAQS, each state must revise its SIP to address how it plans to attain the new standard.

EPA designated portions of the Planning Area as nonattainment for ozone (Phoenix/Mesa area), moderate nonattainment for PM₁₀ (Ajo and Miami areas), serious nonattainment for PM₁₀ (Phoenix area), nonattainment for PM_{2.5} (West Central Pinal County, i.e., Maricopa/Stanfield/ Casa Grande area), maintenance for CO (Phoenix area), and maintenance for SO₂ (Ajo and Miami areas). Map I (reproduced from RMP Map 3-1) displays these areas.

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Map I. Air Pollutant Nonattainment Areas



Note: Reproduced from RMP Map 3-1.

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Table I identifies the SIPs applicable to the Planning Area.

Table I. State Implementation Plans Applicable to the Planning Area

Pollutant	State Implementation Plan
CO	Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area (MAG 2003)
Ozone	Eight-Hour Ozone Plan for the Maricopa County Non-attainment Area (MAG 2007a)
PM₁₀	MAG 2007 Five Percent Plan for PM ₁₀ for the Maricopa County Non-attainment Area (MAG 2007b)
	Ajo PM10 Limited Maintenance Plan and Request for Redesignation (ADEQ 2011)
	Miami Moderate Area PM10 Limited Maintenance Plan and Request for Redesignation to Attainment (ADEQ 2008)
PM_{2.5}	West Central Pinal County State Implementation Plan (PAQCD, in preparation)
SO₂	Ajo Sulfur Dioxide Nonattainment Area State Implementation and Maintenance Plan (ADEQ 2002a)
	Miami Sulfur Dioxide State Implementation and Maintenance Plan (ADEQ 2002b)

CO carbon monoxide
PM particulate matter
SO₂ sulfur dioxide

2. THE GENERAL CONFORMITY PROCESS

2.1. OVERVIEW

Section 176(c) of the CAA states that no Federal entity shall engage in, support in any way or provide financial assistance for, license or permit, or approve, any activity which does not “conform” to the applicable SIP. The purpose of this conformity requirement, as stated in Section 176(c), is to ensure that Federal activities: (1) comply with the applicable SIP’s purpose of eliminating or reducing the severity and number of violations of the NAAQS, and achieving expeditious attainment of such standards; and (2) assuring that such activities will not: (a) cause or contribute to any new violation of any standard in any area; (b) increase the frequency or severity of any existing violation of any standard in any area; or (c) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

To implement Section 176(c), the EPA has issued two regulations: (1) the Transportation Conformity Rule (40 CFR part 93, subpart A) which applies to Federal actions funded under the Federal Aid Highway Act (U.S.C. Title 23) or the Federal Transit Act (U.S.C. Title 49 Chapter 53), and (2) the General Conformity Rule (40 CFR Part 93, Subpart B) which applies to all other Federal actions. Most actions subject to the Transportation Conformity Rule are highway or transit projects funded by the Federal Highway Administration or the Federal Transit Administration. BLM actions are not funded by these agencies and not subject to the Transportation Conformity Rule, but are subject to the General Conformity Rule. The conformity rules apply only to Federal actions in nonattainment or maintenance areas (collectively referred to as nonattainment areas [NAAs]).

The General Conformity Rule established a process based on emissions analysis to determine whether a Federal action conforms to the applicable SIP. When developing the General Conformity Rule, the EPA

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recognized that many actions conducted by Federal agencies do not result in substantial increases in air pollutant emissions in nonattainment and maintenance areas. Therefore, the EPA established threshold levels (also referred to as *de minimis* levels) for emissions of each of the criteria pollutants. Table 2 lists the criteria pollutant thresholds that are applicable to the Planning Area. Map 2 (reproduced from RMP Map 1-2) displays the locations of the Planning Area and the Decision Areas in the region along with other geographic references that are useful in locating places named in the RMP and the conformity analysis.

Table 2. General Conformity Emissions Thresholds Applicable to Planning Area

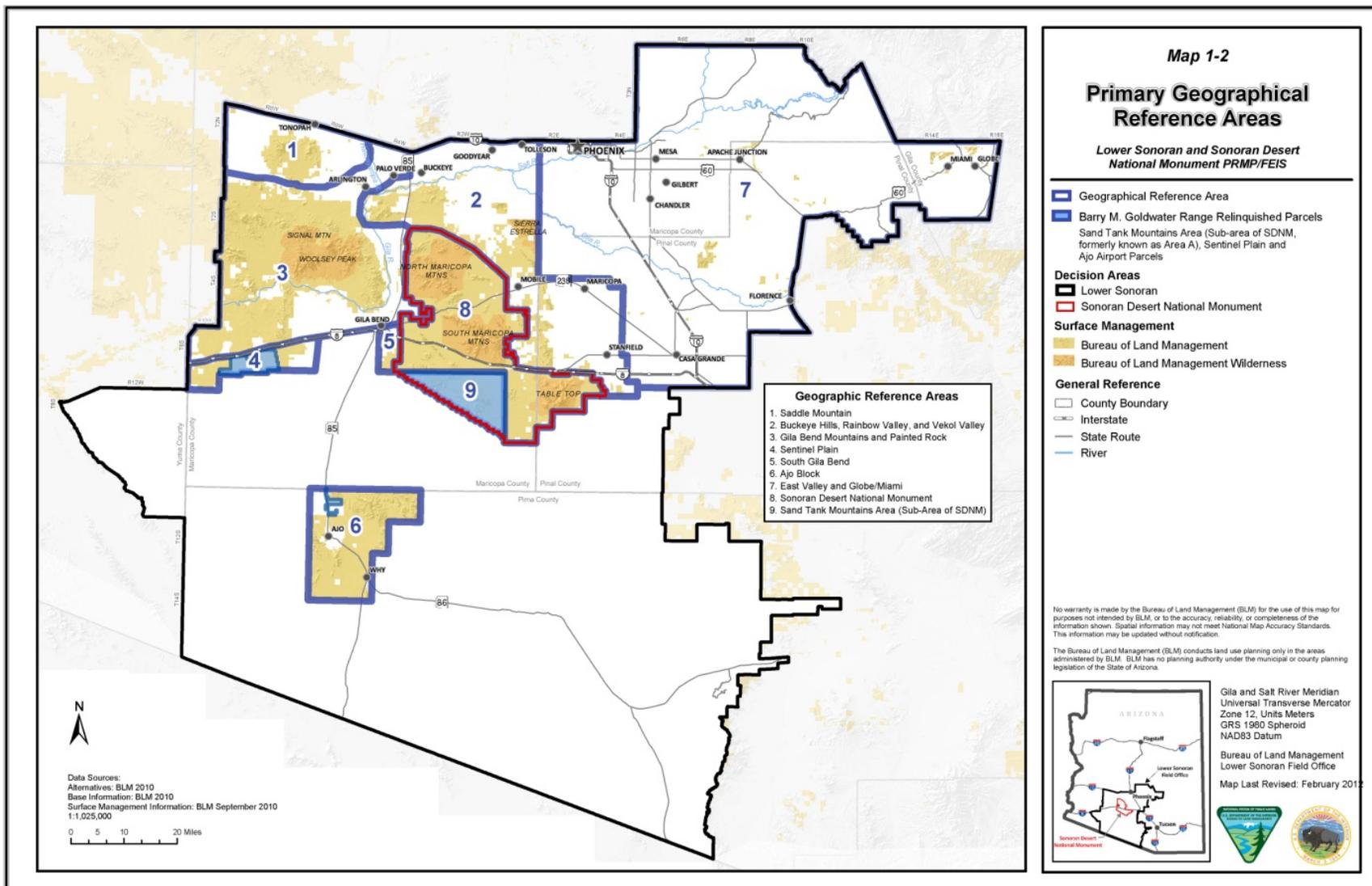
City or Region	Pollutant	Area Designation	Threshold (tons per year)
Ajo	PM ₁₀	Moderate Nonattainment	100
Ajo	SO ₂	Maintenance	100
Miami	PM ₁₀	Moderate Nonattainment	100
Miami	SO ₂	Maintenance	100
Phoenix	CO	Maintenance	100
Phoenix	PM ₁₀	Serious Nonattainment	70
Phoenix/Mesa	Ozone	Nonattainment (former Subpart I)	100 (NO _x or VOC)
West Central Pinal County	PM _{2.5}	Nonattainment	100

Sources: Area Designation – 40 CFR 81, Threshold – 40 CFR § 93.153(b)(1) and (2).

CO carbon monoxide
 NO_x nitrogen oxides
 PM particulate matter
 SO₂ sulfur dioxide
 VOC volatile organic compound

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Map 2. Primary Geographical Reference Areas



Note: Reproduced from RMP Map 1-2.

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If the net emissions increases attributable to the Federal action are less than the threshold levels, then the action is presumed to conform and no further conformity evaluation is required. If the emissions increases exceed any of the thresholds, and the action does not meet any of a number of criteria in the rule for exemptions or presumption of conformity, then a formal conformity determination is required. A conformity determination can include air quality modeling studies; consultation with EPA and state air quality agencies; and commitments to revise the SIP, obtain emission offsets, or to implement measures to mitigate air quality impacts.

The conformity process is conducted in three phases: applicability, evaluation, and determination. The applicability phase determines whether the Federal action is exempt from the conformity rule or otherwise does not require further analysis to demonstrate conformity. Actions that require further analysis to demonstrate conformity proceed to the evaluation phase. The evaluation phase requires estimating the changes in emissions due to the action (i.e., the proposed Federal action emission levels minus the no action emission levels, also known as the “net emissions”) and comparing them to the *de minimis* thresholds. If the changes in emissions due to the action would exceed the thresholds, then the determination phase applies, in which a formal conformity determination must be prepared.

2.2. APPLICABILITY

The first phase of the conformity process evaluates whether the conformity regulations would apply to the action. A conformity determination is not required if any of the following conditions apply:

1. The Federal action would occur in an attainment area;
2. The emissions caused by the action are not direct or indirect emissions as defined in the General Conformity Rule;
3. The action is listed in the rule as exempt;
4. The action is listed in the rule or by BLM as presumed to conform; or
5. The emissions increases due to the action are less than the *de minimis* levels.

In addition, a conformity determination is not required for alternatives other than the proposed Federal action. Consequently, the conformity analysis of the RMP was conducted only for the Proposed RMP (Alternative E).

2.2.1. DIRECT AND INDIRECT EMISSIONS

With respect to the second condition above, the General Conformity Rule defines emissions as direct or indirect (40 CFR § 93.152). Emissions that do not meet the definitions of direct or indirect are exempt from the General Conformity Rule. Direct emissions are those that occur at the same time and place as the Federal action. As stated in 40 CFR § 93.152, indirect emissions are those emissions of a criteria pollutant or its precursors that meet the following definition:

1. That are caused or initiated by the Federal action and originate in the same nonattainment or maintenance area but occur at a different time or place from the action;
2. That are reasonably foreseeable;
3. That the agency can practically control; and
4. For which the agency has continuing program responsibility.

For the conformity evaluation, BLM used this four-point definition of emissions to identify actions that could increase emissions.

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2.2.2. EXEMPTIONS AND ACTIONS PRESUMED TO CONFORM

Certain Federal actions are exempt from the requirements of the General Conformity Rule or are presumed to conform because they result in no emissions or minimal emissions. Common examples of these actions include continuing and recurring activities such as permit renewals where activities conducted will be similar in scope and operation to activities currently being conducted; routine operation of facilities, mobile assets, and equipment; and transfers of ownership, interests, and titles in land, facilities, and real and personal properties. (See 40 CFR § 93.153[c] and [d] for the complete list of actions.) BLM accounted for exemptions, which cover many management actions, in identifying actions that could increase emissions for purposes of the conformity evaluation.

The General Conformity Rule contains a provision that allows agencies to develop their own list of actions presumed to conform which would be exempt from the requirements of the rule. BLM has not established a list of actions presumed to conform under its air quality guidance (Manual 7300 – Air Resource Management Program).

If the Federal action would occur in a nonattainment or maintenance area, would have direct or indirect emissions, and is not on the list of actions that are exempt or the list of actions presumed to conform, the emissions resulting from the Federal action must be analyzed and the results compared to the *de minimis* levels.

2.3. EVALUATION AND ANALYSIS THRESHOLDS

In the second phase of the conformity process, the total annual emissions of the pollutant(s) of concern resulting from the Proposed RMP are estimated, and any increases are compared to the No Action Alternative. Numerous modeling and calculation methodologies are available to estimate emissions depending on the characteristics of the source and the planned activities. The increase compared to the No Action Alternative (the net emissions) is compared to the *de minimis* thresholds that apply to the nonattainment or maintenance area in which the action would occur. If the estimated net emissions are less than the applicable *de minimis* thresholds, the conformity determination requirements do not apply to the Federal action.

2.4. CONFORMITY DETERMINATION

If the estimated net emissions are greater than the applicable *de minimis* thresholds, the Federal agency must prepare a conformity determination for the Federal action. The General Conformity Rule provides eight basic approaches or criteria for demonstrating conformity:

1. Document that the emissions from the action are specifically identified and accounted for in the implementation plan (see 40 CFR § 93.158(a)).
2. Obtain a statement from the applicable state, tribal, or local air quality agency that the emissions from the action along with all other emissions in the area do not exceed the budget for those emissions in the implementation plan (see 40 CFR § 93.158(a)).
3. Have the state or tribe agree to revise the implementation plan to include the emissions from the Federal action (see 40 CFR § 93.158(a)).
4. Have the local Metropolitan Planning Organization provide a statement that the emissions are included in the modeling for a conforming transportation plan and program (see 40 CFR § 93.158(a)).
5. Conduct air quality modeling to demonstrate that the emissions will not cause or contribute to a violation of the NAAQS (see 40 CFR § 93.158(a)). This modeling option is allowed for demonstrating conformity of directly-emitted pollutants only. (EPA does not believe that

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current models are adequate to reasonably predict the project-level impact of individual sources of precursors of ozone or PM_{2.5}. See the preamble to the 2010 conformity rule amendments, 75 *Federal Register* 17254.)

6. Fully mitigate or offset the increase in emissions (see 40 CFR § 93.158(a) and § 93.160).
7. Develop and implement a facility-wide emission budget. This approach requires a revision to the implementation plan as in approach 4 above. If the net emissions from the Federal action along with the other emissions from the facility do not exceed the budget, then the Federal action is presumed to conform (see 40 CFR § 93.161).
8. Create and apply emission reduction credits. Credits must meet several requirements in order to be eligible for use in a conformity determination (see 40 CFR § 93.165).

The conformity analysis procedures in the General Conformity Rule contain detailed technical requirements for demonstrating how an action would conform to the applicable implementation plan under these approaches (see 40 CFR § 93.159).

If a conformity determination were to be required for the RMP, BLM would select one or more of these options to develop a formal conformity determination for the Proposed RMP.

3. EVALUATION OF EMISSIONS FOR THE PROPOSED RMP

3.1. APPROACH TO THE ANALYSIS

This air quality general conformity analysis determines whether or not the activities and actions of the Proposed RMP are subject to and meet the requirements of the General Conformity Rule and conform to the applicable SIPs. This conformity evaluation discusses the proposed management actions within each program area and identifies whether the Proposed RMP potentially could result in an increase in criteria pollutant emissions compared to the No Action Alternative. For those actions that would result in a potential increase in emissions, BLM quantified the increase.

BLM first reviewed SIPs and other relevant documents issued by EPA, the Arizona Department of Environmental Quality, the Maricopa Association of Governments, The Maricopa County Air Quality Department, the Pima County Department of Air Quality, and the Pinal County Department of Air Quality for any provisions that would affect the General Conformity requirements applicable to the Proposed RMP.

Based on review of the proposed management activities and actions, and as stated in the Proposed RMP, BLM anticipates no changes in emissions and no impacts to air resources management for management actions relating to the following program areas:

- Air Quality
- Cave Resource Management
- Cultural and Heritage Resource Management
- Paleontological Resource Management
- Social and Economic Concerns
- Vegetation Resource Management
- Water Resource Management
- Wild Horse and Burro Management

Accordingly, management actions under these program areas are presumed to conform and were not assessed further in the conformity evaluation.

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For program areas other than those identified above, BLM used a qualitative analysis to identify the likely emission changes for each management action in terms of direction (increase/no change/decrease) compared to the No Action Alternative to assess the need for quantification of those changes. BLM reviewed the Management Alternatives in Chapter 2 of the Proposed RMP and the Impacts on Air Quality section in Chapter 4 for the qualitative analysis. BLM also reviewed the reasonably foreseeable development scenarios described in Chapter 4 of the Proposed RMP. These sections of the Proposed RMP provide information that can be used to determine whether emissions would change from current management (No Action Alternative) to the Proposed RMP (Alternative E), and if so in which direction. Where the Proposed RMP states the direction in which emissions would change, the conformity analysis reviewed and confirmed the RMP assessment. Where the Proposed RMP makes no such statement, BLM assessed the likely direction of the emissions change from the information given in the management actions, such as the number of acres or road-miles that would be subject to the various use restrictions.

The qualitative analysis assumed that emissions would vary based on the quantity of resource (e.g., road-miles or acres) made available, which may not necessarily be the case. For example, reductions in the number of road-miles available for recreational use may not necessarily decrease the amount of use (at least for small reductions) but may only lead to the same emissions being distributed over fewer road-miles. An increase in available road-miles may not increase emissions but may only distribute the same amount of use and emissions over more road-miles, unless latent demand exists such that the increased mileage would attract additional use. However, the Proposed RMP assumption that emissions would vary directly with the quantity of resource made available is reasonable, and in cases like the example above may be conservative in the sense of underestimating decreases and overestimating increases in emissions.

Where BLM identified management actions that could lead to increased emissions, the emissions for those program areas were quantified. The Identification of Emissions Changes by Program Area section below describes the methods and models used in the quantification of emissions for the individual program areas. BLM made the following assumptions to ensure the analysis would be conservative and provide a worst-case quantification of the total potential emissions increases associated with the Proposed RMP:

- All activities would occur in the same year.
- The emission rates for all vehicles and equipment are the maximum rates expected to occur during the planning period, i.e., the calendar year 2013 fleet was assumed.
- Emissions from activities in all of the NAAs in the Planning Area are summed as if they occurred in the same NAA.
- Decreases in emissions, which can be used to offset increases, were not quantified.

The individual program areas include additional assumptions, as appropriate.

Table 3 identifies if management actions associated with resource programs would result in a change in emissions compared to the No Action Alternative and the direction of the change.

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Table 3. Summary of Emission Changes by Resource Program

Resource Program	Emissions Change under the Proposed RMP	
	Lower Sonoran Decision Area	Sonoran Desert National Monument Decision Area
Air Quality	No change	No change
Cave Resources	No change	No change
Cultural and Heritage Resource Management	No change	No change
Paleontological Resource Management	No change	No change
Social and Economic Concerns	No change	No change
Vegetation Resource Management	No change	No change
Water Resource Management	No change	No change
Wild Horse and Burro Management	No change	No change
Lands and Realty	No difference, or decrease	Decrease
Livestock Grazing Management	No difference	Decrease
Minerals Management	No difference	No change
Recreation	Increase	Increase
Special Designations Management	Decrease	No change
Travel Management	Increase	Increase
Visual Resources Management	Decrease	Decrease
Wildland Fire Management	No difference	No difference
Wildlife and Special Status Species	Decrease	No change

Note: No change means the program has no effect on air quality. No difference means the program may affect air quality but the impacts in the Proposed RMP would not differ from those in the No Action Alternative.

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3.2. IDENTIFICATION OF EMISSIONS CHANGES BY DECISION AREA

The following sections discuss the potential changes in emissions within the two decision areas for each program area. For each program area the results of the qualitative analysis are explained. For program areas that could lead to increased emissions, the emissions increases are quantified. To facilitate easy reference to the Proposed RMP, the structure of these sections parallels that of the Chapter 4 sections of the Proposed RMP which presents program areas in alphabetical order.

3.2.1. LOWER SONORAN DECISION AREA

3.2.1.1. LANDS AND REALTY

BLM is authorized under several authorities to acquire, dispose of, convey, and lease portions of the federally owned land it manages for the benefit of the national interest. Land tenure decisions select lands for retention, proposed disposal, acquisition, or lease. The lands and realty program for the Planning Area consists of three distinct parts: (1) land use authorizations (LUAs), which includes rights-of-way (ROWs) for such developments as roads, power lines, pipe lines, and renewable energy

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development proposals; (2) land tenure adjustments (disposal and acquisition of lands); and (3) withdrawals, classifications, and segregations. Land tenure decisions must achieve the goals, standards, and objectives outlined in the land use plan.

Potential air quality impacts would stem primarily from land use allocations or actions that would prevent or encourage the authorization of ROWs, leases, and land tenure actions in certain resource-rich areas. These allocations and actions could affect the potential development of energy facilities and utility corridors.

Much of the reasonably foreseeable development is driven by infrastructure demand, especially in rural portions of the Planning Area that are developing and urbanizing. This demand is driven by market forces and would not differ between Alternative E and Alternative A. Any differences in emissions between Alternative E and Alternative A due to such infrastructure demand would occur as a result of land use allocations or management actions that could affect whether the infrastructure would be located in an NAA (e.g., renewable energy exclusion areas identified in the Proposed RMP).

Table 4 presents lands and realty impacts in terms of acreage avoided and excluded. For the specific management actions included in Alternatives A and E, see the Lands and Realty section in Chapter 2 of the Proposed RMP.

Table 4. Key Lands and Realty Allocations for the Lower Sonoran Decision Area

Allocation	Alternative				
	A (No Action)	B	C	D	E (Proposed RMP)
Land Use Authorizations: Utility-scale Renewable Energy Avoidance and Exclusion Areas					
Acres avoided (moderate and high sensitivity conflict areas)	0	727,600	617,500	405,100	499,900
Acres excluded (prohibited areas)	105,000	160,100	293,800	519,400	394,200
Land Use Authorizations: Utility Corridors					
Total Corridor Acres	134,328	134,328	95,203	72,153	82,301
Land Use Authorizations: Avoidance and Exclusion Areas (acres)					
LUA Avoidance Area	0	609,000	449,500	260,500	344,800
LUA Exclusion Area	105,100	143,700	271,900	593,600	295,100

Source: BLM 2012

LUA land use authorization
RMP Resource Management Plan

Table 4 shows that the number of acres avoided or excluded to LUAs under Alternative E would increase compared to Alternative A, and the number of acres allocated to utility corridors would decrease under Alternative E compared to Alternative A. These restrictions (status as avoided, excluded, or not allocated to a utility corridor) reduce the potential for development and associated emissions in the identified areas. As a result, the number of acres avoided and excluded can be used as a proxy for the amount of development, and therefore emissions that could occur.

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All lands and realty management actions specific to NAAs included in Alternative E are also included in Alternative A. Land use allocations and activity indicated in Table 4 for the entire LSDA are expected to be representative for the portions of the LSDA within the NAAs. The degree of restriction, as indicated by the number of acres avoided, excluded, or not allocated to a utility corridor would be greater under Alternative E. As a result, effects in the NAAs of lands and realty actions are expected to be less under Alternative E than Alternative A. Also, Alternative E includes additional measures to reduce fugitive PM emissions from surface disturbance that are not included in Alternative A. (Fugitive PM emissions are airborne particles generated by wind blowing across an exposed earth or material surface, or by the action of vehicle tires on the road or ground surface.) Because there would be no potential for emissions increases in the NAAs resulting from Alternative E, lands and realty actions in the LSDA do not require further conformity evaluation.

3.2.1.2. LIVESTOCK GRAZING MANAGEMENT

The livestock grazing management program in the Planning Area carries out the intent of the Taylor Grazing Act of 1934, the Federal Land Policy and Management Act of 1976, and the Public Rangelands Improvement Act of 1978. Grazing permits or leases are valid for up to 10 years and authorize grazing within grazing districts on public land and other land administered by the BLM under Section 3 of the Taylor Grazing Act, and outside of grazing districts under Section 15 of the Taylor Grazing Act. Potential air quality impacts would result primarily from developing or maintaining livestock facilities, rangeland improvements, or other activities involving construction and surface disturbance. Management actions also may affect forage levels and the degree of human disturbance of livestock during recreational activities.

Table 5 presents livestock grazing impacts in terms of acreage and animal unit months (AUMs). For specific management actions included in Alternatives A and E, see the Livestock Grazing section in Chapter 2 of the Proposed RMP.

Table 5. Key Land Use Allocations for Livestock Grazing for the Lower Sonoran Decision Area

Allocation	Alternatives				
	A (No Action)	B (Reduced Perennial)	C (Perennial Only/ No Ephemeral)	D (Closed)	E (Proposed RMP)
Available Acres ¹	830,300	830,300	830,600	0	830,600
Unavailable Acres ¹	58,700	58,700	58,400	873,000	58,400
Total Acres	930,200	930,200	930,200	930,200	930,200
Total Proposed (AUMs ²)	17,541	10,431 ³	17,541	0	17,541

¹ Under each alternative, approximately 41,200 acres are either not under a Bureau of Land Management grazing permit or not part of a grazing allotment. These acres are not included in acreage available or unavailable for livestock grazing but are accounted for in total acres.

² Animal Unit Month (AUM) is the amount of forage necessary for the sustenance of one cow or its equivalent for a period of 1 month.

³ Ephemeral AUMs are permitted on a case-by-case basis pursuant to the Special Ephemeral Rule. These AUMs are not included in the proposed perennial AUMs listed.

Source: BLM 2012

RMP Resource Management Plan

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Table 5 shows that the number of acres available for grazing, and the number of AUMs, would be nearly the same for Alternative E and Alternative A. The number of acres available and the total AUMs can be used as a proxy for construction and other activity, and therefore emissions that could occur. Land use allocations and activity indicated in Table 5 for the entire LSDA are expected to be representative for the portions of the LSDA within the NAAs. As a result, effects in the NAAs of livestock grazing actions are not expected to differ between Alternative E and Alternative A, and expected emissions in the NAAs for Alternative E would be the same as Alternative A. Because there would be no potential for emissions increases in the NAAs resulting from Alternative E compared to Alternative A, livestock grazing management in the LSDA does not require further conformity evaluation.

3.2.1.3. MINERALS MANAGEMENT

The BLM supports mineral exploration and development on public lands in keeping with its multiple-use mandate. BLM manages three categories of minerals:

- Locatable minerals, which include precious metals such as gold, silver, copper, and some industrial minerals such as gypsum and clay;
- Leasable minerals, which include oil, natural gas, coal, sodium, and geothermal resources; and
- Saleable minerals, which include sand and gravel, decorative rock, and other common minerals.

Any development of the leasable, saleable, and locatable mineral resources could create short-term and periodic increased emissions from construction, vehicle traffic, and other activities. The location and intensity of such development would vary with the specific land use allocations and other management actions taken. According to the RMP, BLM's management actions and the resulting potential changes in emissions would be the same for both Alternative A and Alternative E. Specific management actions may be more restrictive under Alternative E than under Alternative A, resulting in potentially lower emissions under Alternative E. The locations of future minerals development would depend on where suitable minerals deposits are found, and consequently may not, in some cases, be reasonably foreseeable. However, management actions associated with Alternative E would not shift minerals development from attainment areas into NAAs.

Table 6 presents minerals management impacts in terms of acreage available for development. For the specific management actions included in Alternatives A and E, see the Minerals Management section in Chapter 2 of the Proposed RMP.

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Table 6. Key Land Use Allocations for Minerals Management in the Planning Area

Allocation	Alternative (BLM acres [percent])				
	A (No Action)	B	C	D	E (Proposed RMP)
Acres of BLM-administered Surface Lands/Subsurface Mineral Estate					
Locatable Minerals					
Total Closed	625,000 (47%)	627,350 (47%)	627,300 (47%)	1,018,900 (76%)	627,300 (47%)
Total Open	713,300 (53%)	710,950 (53%)	711,000 (53%)	319,400 (24%)	711,000 (53%)
Leasable Minerals					
Total Closed	625,000 (47%)	627,300 (47%)	627,300 (47%)	1,209,900 (90%)	627,300 (47%)
Total Open	713,300 (53%)	711,000 (53%)	711,000 (53%)	128,400 (10%)	711,000 (53%)
Saleable Minerals					
Total Closed	625,000 (47%)	649,700 (49%)	818,300 (61%)	1,181,000 (88%)	780,800 (58%)
Total Available	713,300 (53%)	688,600 (51%)	520,000 (39%)	157,300 (12%)	557,500 (42%)
Acres of Non-BLM Surface Land/BLM-administered Subsurface** (Split Estate)					
Total Closed	71,000 (34%)				
Total Open	139,000 (66%)				
Total	210,000 (100%)				

** The definition for Non-BLM Surface Land means lands not owned or administered by BLM, such as lands owned or administered by other Federal agencies, the State of Arizona, local municipalities, and private parties.

Source: BLM 2012

BLM Bureau of Land Management
LSDA Lower Sonoran Decision Area
RMP Resource Management Plan
SDNM Sonoran Desert National Monument

Table 6 shows that the number of acres available would be less for Alternative E than for Alternative A, and the number of acres closed would be greater for Alternative E than for Alternative A. The number of acres available can be used as a proxy for the construction, vehicle travel, and equipment operation associated with minerals development, and therefore emissions that could occur. Land use allocations and activity indicated in Table 6 for the entire LSDA are expected to be representative for the portions of the LSDA within the NAAs. As a result, expected emissions in the NAAs due to minerals management actions under Alternative E would be less than under Alternative A. Because there would be no potential for emissions increases in the NAAs due to Alternative E, minerals management actions in the LSDA do not require further conformity evaluation.

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3.2.1.4. RECREATION MANAGEMENT

Introduction

Recreational experiences, setting, and activities in the Planning Area range from areas with primitive, roadless qualities to more modified and roaded natural areas. Within the Planning Area, visitors can, among other things, bike, camp, hike, ride horseback, backpack, hunt, target shoot, drive off-highway vehicles (OHVs) on vehicle routes, picnic, rock hound, geocache, observe cultural and historic sites, view/photograph wildlife, and experience wilderness areas. The dramatic increase in population within and surrounding the Planning Area has resulted in increased demands for outdoor recreational opportunities and management of public lands including the LSDA. Recreational activities in both Decision Areas have increased substantially due to newly developed residential communities adjacent to large blocks of public lands. This trend is especially pronounced in the northern portion of the LSDA which is nearer to developing areas of metropolitan Phoenix than the SDNM. The effect of increased population and development on the demand for recreational activities will occur equally with all RMP alternatives and does not, in itself, affect compliance of the RMP with the General Conformity Rule.

Description of Impacts

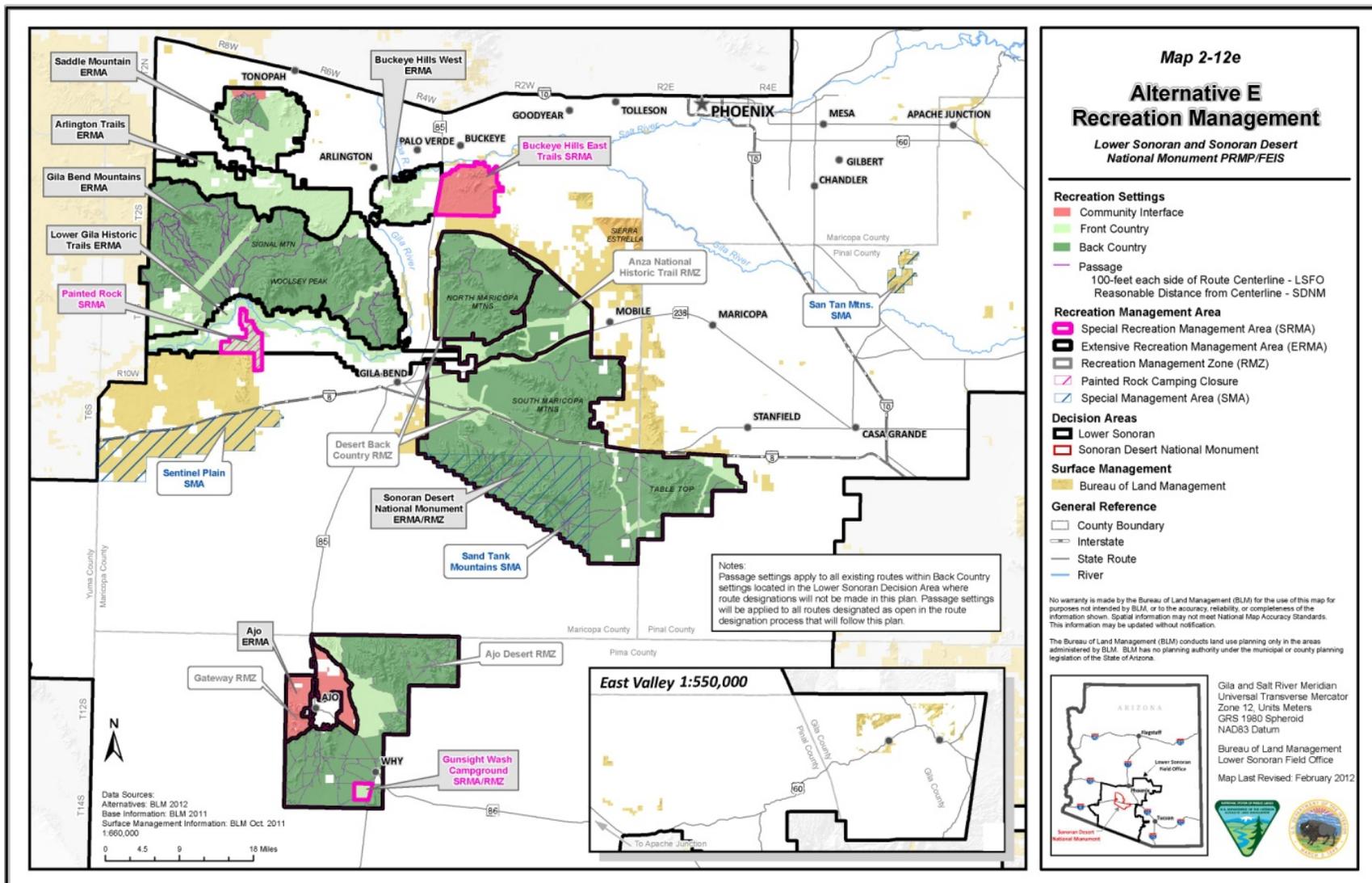
Potential air quality impacts would stem primarily from management actions that affect recreational resources and travel across public lands. (Potential air quality impacts associated with travel management are discussed separately below.) Under Instruction Memorandum No. 2011-004, the BLM established a three-tier system of Recreation Management Areas (RMAs) or lands managed for recreation: Special Recreation Management Areas (SRMA), Extensive Recreation Management Areas (ERMA) and Undesignated Lands (UL) which are defined as follows (refer to the Proposed RMP recreation sections for additional information):

- SRMAs are administrative units where the existing or proposed recreation opportunities and recreation setting characteristics are recognized for their unique value and importance, or distinctiveness, especially as compared to other areas used for recreation. Within an SRMA, recreation management is recognized as the predominant planning focus where specific recreation opportunities and recreation setting characteristics are managed and protected on a long-term basis.
- ERMAs are administrative units that require specific management consideration in order to address recreation use, demand or recreation and visitor services program investments. Management of ERMAs supports and sustains the principal recreation activities and the associated qualities and conditions of the ERMA. Management of ERMA areas is commensurate with the management of other resources and resource uses.
- Public lands that are not designated as RMAs – ULs – are managed to meet basic recreation and visitor services and resource stewardship needs. Recreation is not emphasized; however, recreation activities may occur. Management of recreation and visitor services allows recreation uses that are not in conflict with the primary uses of these lands.
- To effectively manage for differing expected outcomes within a RMA, SRMAs and ERMAs may be subdivided into separate Recreation Management Zones (RMZs). The RMZs provide for management emphasis tailored to expected recreation opportunities and outcomes over two or more specific geographic areas within an individual RMA.

Map 3 (reproduced from RMP Map 2-12e) displays the locations of the RMAs proposed for Alternative E.

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Map 3. Alternative E Recreation Management



Note: Reproduced from RMP Map 2-12e.

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Table 7 presents recreation management impacts in terms of acreage in managed recreation areas. For the specific management actions included in Alternatives A and E, see the Recreation Management section in Chapter 2 of the Proposed RMP.

Table 7. Key Land Use Allocations for Recreation Management for the Lower Sonoran Decision Area

Recreation Market Strategy	Alternative (BLM acres)				
	A (No Action)	B	C	D	E (Proposed RMP)
Ajo	SRMA	ERMA	ERMA	UL	ERMA
<i>Ajo Desert Zone</i>	--	RMZ	RMZ	UL	RMZ
<i>Ajo Gateway Zone</i>	--	RMZ	RMZ	UL	RMZ
Arlington Trails	--	ERMA	In Gila Bend Mtns. ERMA	UL	ERMA
Buckeye Hills East	--	SRMA	SRMA	SRMA	SRMA
Buckeye Hills West	--	ERMA	ERMA	ERMA	ERMA
Gila Bend Mountains	--	ERMA	ERMA	UL	ERMA
Gila Trails	SRMA	Within portions of Lower Gila Historic Trails ERMA			
Gunsight Wash	--	SRMA	SRMA	UL	SRMA
Lower Gila Historic Trails	--	ERMA	ERMA	UL	ERMA
Painted Rock	--	SRMA	SRMA	SRMA	SRMA
Saddle Mountain	SRMA	SRMA	SRMA	UL	ERMA
Sentinel Plain	SRMA	UL	UL	UL	UL
San Tan Mountains	--	SRMA	UL	UL	UL

Source: BLM 2012

- BLM Bureau of Land Management
- ERMA Extensive Recreation Management Area
- NHT National Historic Trail
- RMP Resource Management Plan
- RMZ Recreation Management Zone
- SRMA Special Recreation Management Area
- UL Undesignated Lands

Table 7 shows that several RMAs managed under Alternative E are not managed under Alternative A. This indicates that the total number of acres in managed recreation areas would be greater for Alternative E than for Alternative A. Some of the management actions that BLM may take in these areas may involve activities that could generate emissions, such as construction of recreational facilities. BLM evaluated each recreation management action proposed under Alternative E to identify all reasonably foreseeable activities that could lead to increased emissions in NAAs compared to Alternative A. BLM identified several specific actions that could lead to increased emissions under Alternative E in the NAAs and quantified the potential emissions increases for these actions.

Quantification of Emissions

The recreation management actions that could increase emissions are construction of recreation facilities and the accompanying infrastructure (e.g., roads, drainage). The Proposed RMP describes the specific planned or reasonably foreseeable management actions that would involve construction. The facilities that could be built in the NAAs under Alternative E that would not be built under Alternative A would be located in the Buckeye Hills East RMZ and consist of the following:

- Five 6-acre staging areas (a staging area typically includes a short gravel-surface access road, a gravel-surface parking lot, picnic tables, fire rings, toilets, kiosks and signs);
- One 10-acre staging area;
- Up to 4 miles of unpaved road; and
- Up to 5 miles of single-track trail.

Not all of these facilities would necessarily be constructed, nor would they necessarily be built in the same year, but they are identified as reasonably foreseeable based on discussions with BLM specialists. In order to provide a conservative (higher emissions) analysis for conformity purposes, emissions were estimated for these facilities assuming that all would be built in the same calendar year. In reality, they could be built at any time during the RMP planning period based on need and available funding.

Construction of staging areas and roads would involve the use of construction equipment, typically backhoes, graders, rollers, and scrapers. Heavy trucks would be used to deliver gravel, concrete, and other materials. A water truck would be used on-site to suppress fugitive dust generation. Light trucks would be used to deliver tools and supplies and for crew transport. Workers would use their personal vehicles for commuting. Construction of single-track trails is done by hand without mechanized equipment, and the only source of emissions is the vehicles used to transport workers to the trailhead. The analysis included exhaust and fugitive dust emissions from each of these sources.

BLM estimated emissions from vehicles using the EPA MOVES2010a model (EPA 2010), and emissions from construction equipment using the EPA NONROAD2008a model (EPA 2008). BLM estimated fugitive PM emissions using procedures in the EPA AP-42 guidance document (EPA 1995). The AP-42 procedure for estimating fugitive PM emissions from unpaved roads requires data on the silt content of the road surface soil. The default input values given in AP-42 are not representative of the road surface conditions in the Planning Area, so BLM used values reported by Goossens and Buck (2009) for silt content. BLM estimated emissions for calendar year 2013 which is assumed to be the earliest year by which BLM could plan and fund the construction. The choice of 2013 is a conservative assumption because vehicle and equipment fleets are becoming cleaner over time as newer units, which are subject to stricter EPA emission standards and have lower emissions, replace older, higher-emitting units. The vehicle and equipment fleet that would be used in years after 2013 would have lower emissions than are estimated in this analysis.

The analysis assumed that vehicles and equipment would operate for a single shift of standard duration per day (typically 10 hours, which can vary for specific activities or equipment). Due to the relatively small size of each facility, construction activities would be expected to occur over a period of no more than a few weeks per site. Appendix A provides further detail on the emissions estimates developed for the conformity analysis.

Table 8 lists the estimated construction emissions for the planned facilities. PM₁₀ emissions include both exhaust and fugitive PM. PM_{2.5} emissions were not estimated because no construction is projected to occur in PM_{2.5} NAAs.

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Table 8. Estimated Construction Emissions (tons) for Site and Road Development in the Buckeye Hills East RMZ

Description	CO	NO _x	SO ₂	VOC	PM ₁₀
Staging areas: five 6-acre and one 10-acre, total 40 acres	25.98	21.52	0.02	2.94	24.79
Road: 4 miles, unpaved, 30-foot width	6.07	5.13	0.005	0.69	3.94
Trails: 5 miles, single-track	0.04	0.01	0.0001	0.001	0.0003
<i>Total</i>	<i>32.09</i>	<i>26.65</i>	<i>0.02</i>	<i>3.64</i>	<i>28.73</i>

Note: Data may not sum to total due to rounding.

CO carbon monoxide
 NO_x nitrogen oxides
 PM particulate matter
 RMZ Recreation Management Zone
 SO₂ sulfur dioxide
 VOC volatile organic compound

BLM anticipates that the presence of these facilities may, by making the area more attractive for recreation, contribute to an increase in visitation and use. However, BLM anticipates that most of any increase in visitation would be attributable to the system of designated OHV travel routes that BLM plans to establish in the Buckeye Hills East RMZ, and to potential BLM efforts to increase marketing of the area to the public. In addition, BLM may allow OHV motorized, competitive speed events (i.e., races) in designated areas of the LSDA. Because of their relationship to the designated route system, emissions due to increased visitation and OHV races are considered under the Travel Management program area below.

3.2.1.5. SPECIAL DESIGNATIONS MANAGEMENT

Special Area Designations describe areas that have special values that warrant or require special management or protection. These areas, which are specifically addressed through the RMP planning process, include Areas of Critical Environmental Concern (ACECs), Scenic and Backcountry Byways, Wilderness Areas, and areas designated as part of the Wild and Scenic River System or National Historic Trails (NHTs). ACECs are areas where unique resources exist, making them worthy of a higher level of concern and protection. Once an ACEC is designated, the focus of management is to preserve and restore the resources that inspired the recommendation for designation.

Seventeen special designation areas currently exist within the Planning Area. Five are located within the LSDA: Sierra Estrella, Signal Mountain, and Woolsey Peak wildernesses; Juan Bautista de Anza NHT; and Coffeepot Botanical ACEC. Impacts would stem primarily from management of resource values associated with existing or proposed ACECs.

Table 9 presents potential impacts in terms of acreage managed as ACECs. For the specific management actions included in Alternatives A and E, see the ACEC section in Chapter 2 of the Proposed RMP.

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Table 9. Key Land Use Allocations for Special Designations in the Lower Sonoran Decision Area: ACECs

ACEC Name	Alternative (BLM Acres)				
	A (No Action)	B	C	D	E (Proposed RMP)
Coffeepot Botanical	8,900	8,900	Not Designated		8,900
Coffeepot-Batamote	Not Designated		63,300	77,600	Not Designated
Cuerda de Lena	Not Designated			60,900	58,500
Lower Gila Terraces and Historic Trails	Not Designated			82,500	82,500
Saddle Mountain	Not Designated			48,500	48,500

Source: BLM 2012

ACEC Area of Critical Environmental Concern
BLM Bureau of Land Management
RMP Resource Management Plan

Table 9 shows that the number of acres managed as ACECs in the LSDA would be greater for Alternative E than for Alternative A. The number of acres can be used as a proxy for the intensity of activities, and therefore emissions that could occur. Allowable activities in ACECs are more restricted than in areas not designated as ACECs, and as a result emissions are expected to be lower. With respect to the NAAs, the only ACEC-designated acreage that is located in an NAA is a portion of the Coffeepot-Batamote, a portion of the Cuerda de Lena, most of the Lower Gila Terraces and Historic Trails, and a very small portion of the Saddle Mountain ACEC. There is ACEC-designated acreage in an NAA under Alternative E that would not be ACEC-designated under Alternative A. In contrast, all ACEC-designated acreage in an NAA under Alternative A would also be ACEC-designated under Alternative E. As a result, the effects in the NAAs of ACEC designation are expected to lead to lower emissions under Alternative E compared to Alternative A. Because there would be no potential for emissions increases in the NAAs due to Alternative E, special designations management actions in the LSDA do not require further conformity evaluation.

3.2.1.6. TRAVEL MANAGEMENT

Introduction

Travel management strives to provide manageable access to public lands while balancing resource protection. The allocation of areas as open, closed or limited to OHVs directs the management approach for vehicular travel on public lands. Implementation-level actions such as designating routes as part of a planned network help create a balance between human use and resource protection.

Description of Impacts

From an air quality perspective the predominant impacts from travel are exhaust emissions from motor vehicles, both on-road and off-road, and fugitive PM emissions generated by the action of vehicle tires on the road or ground surface. The level of vehicle usage, and thus the emissions, would vary with BLM’s RMP-level travel management decisions for designating areas as open, limited, or closed to OHV use, and the implementation-level decisions for designating particular routes as open, limited, or closed to public use. Increasing restrictions to motorized recreation and access would result in a progressively

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limited, motorized route network and reduced access. Limitations on routes and access would tend to reduce vehicle emissions by decreasing vehicle usage overall and by confining vehicles to designated routes on which BLM could concentrate maintenance and dust control efforts. Impacts from not having a route system could include the continued establishment of unwanted access points and routes leading into public lands, which would result in higher emissions, especially fugitive PM from increased ground disturbance.

Table 10 presents travel management impacts in terms of acreage under different management regimes. For the specific management actions included in Alternatives A and E, see the Travel Management section in Chapter 2 of the Proposed RMP.

Table 10. Key Travel Management Allocations for the Lower Sonoran Decision Area

Decision	Alternative (BLM acres)				
	A (No Action)	B	C	D	E (Proposed RMP)
Open	0	40	0	0	0
Closed	100,000	91,100	91,100	342,700	91,100
Limited to existing roads and trails	830,200	0	0	0	0
Limited to Designated Routes	0	839,060	839,100	587,500	839,100
<i>Total</i>	<i>930,200</i>	<i>930,200</i>	<i>930,200</i>	<i>930,200</i>	<i>930,200</i>

Source: BLM 2012

BLM Bureau of Land Management
RMP Resource Management Plan

Table 10 shows that although the number of acres closed to OHV travel and limited to existing roads and trails would be less for Alternative E than for Alternative A, the number of acres limited to designated routes would be much greater for Alternative E than for Alternative A. Although the increase in acreage limited to designated routes suggests that, in general, the potential for emissions would be lower under Alternative E than Alternative A, BLM expects that the establishment of a designated route system could lead to increased visitation in certain areas, specifically the Buckeye Hills East RMZ, and correspondingly increased emissions from vehicle usage under Alternative E. BLM anticipates that outside the Buckeye Hills East RMZ, Alternative E would result in no effect or a slight decrease in user activity compared to Alternative A. This decrease would reduce emissions outside the Buckeye Hills East RMZ but has not been quantified in this conformity analysis. For the Buckeye Hills East RMZ, which is within the NAAs, Alternative E would designate routes and limit use to the designated routes. Designation can make the availability of an area easier to publicize and so can attract new visitors who may not have been aware of the area as a recreation destination.

The designated route system would prohibit the use of undesignated routes. This would confine visitors to the designated area and thus reduce usage in other areas that are outside of the designated route system. Those visitors who previously used the areas outside of the designated route system would be shifted to the designated area, increasing the total usage of the designated route system. Because the increased use would occur within the NAAs while the decreases would occur predominantly outside

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the NAAs, the resulting increase in emissions must be considered in the conformity evaluation even though it represents only a shift in location and not an increase in the LSDA as a whole.

In addition, designating routes would reduce fugitive PM emissions because users would no longer be allowed to travel off trail, breaking new ground and eroding it. The amount of reduction in off-trail travel and fugitive PM emissions is difficult to estimate and currently available data are insufficient to do so. This potential reduction has not been quantified in the conformity evaluation.

Quantification of Emissions

It is reasonably foreseeable that establishment of a designated route system in the Buckeye Hills East RMZ could lead to increases in visitation and associated emissions. To estimate the increase in emissions in the Buckeye Hills East RMZ as a result of the designated route system (including increased visitation at the planned new facilities discussed above in Recreation Management), BLM used a database of OHV counts gathered at the BLM Boulders OHV Area, located in the Hieroglyphic Mountains approximately 20 miles northwest of Phoenix. The BLM processed the vehicle count data using the Recreation Management Information System to estimate seasonal and annual visitation levels. Based on comparison of conditions and usage patterns in the Boulders OHV Area and the Buckeye Hills East RMZ, BLM staff estimated the increase in visitation and vehicle use, and the resulting emissions increases, that would be expected at Buckeye Hills East under Alternative E including the designated route system.

BLM may issue permits for OHV competitive, motorized speed events (i.e., races) in the LSDA. BLM considers applications for permits for these events on a case-by-case basis. In recent years BLM has not received applications or has denied them. With the increase in travel management actions under Alternative E, BLM anticipates that the number of applications may increase, and accordingly emissions increases from OHV races are reasonably foreseeable. Races would be held only at designated locations, one of which is the Buckeye Hills East RMZ located within the NAA. BLM anticipates a maximum of one race event per year.

Based on past experience, the BLM made the following assumptions to estimate the emissions from an annual OHV race event:

- The event would consist of a 200-mile race for trucks and other 4-wheel vehicles and a 100-mile race for motorcycles;
- Each race would take place on a 40-mile course;
- Each race would have 100 participants; and
- The event would attract 100 vehicles for organizers, support, volunteers, and concessionaires, and 500 vehicles for spectators.

Table II lists the estimated emissions due to increased visitation and OHV races. PM_{10} emissions include both exhaust and fugitive PM. $PM_{2.5}$ emissions were not estimated because no increased visitation or OHV races are projected to occur in $PM_{2.5}$ NAAs.

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Table II. Estimated Emissions (tons per year) due to Increased Visitation and OHV Races in the Buckeye Hills East RMZ

Description	CO	NO _x	SO ₂	VOC	PM ₁₀
Increased visitation (vehicle use)	2.94	0.40	0.003	0.31	7.37
OHV races	0.84	0.05	0.001	0.54	9.75
<i>Total</i>	<i>3.78</i>	<i>0.45</i>	<i>0.004</i>	<i>0.85</i>	<i>17.12</i>

CO carbon monoxide
 NO_x nitrogen oxides
 OHV Off-highway vehicle
 PM particulate matter
 RMZ Recreation Management Zone
 SO₂ sulfur dioxide
 VOC volatile organic compound

3.2.1.7. VISUAL RESOURCES MANAGEMENT

The Planning Area is generally located in the Basin and Range Physiographic Province. The scenery of the LSDA includes rugged mountains, striking cliff formations, foothills, mesas, washes, bajadas, and broad plains. Major visual intrusions include highways and other vehicle routes, evidence of mining and ranching, and utility ROWs.

Outstanding scenic landscapes administered by the BLM provide a place to escape and enjoy the beauty of nature. They also are used for a multitude of other activities, including recreation, mining, grazing, and road development. Many of these activities have the potential to disturb the landscape and to have impacts on scenic values. BLM is required to manage public lands to protect their scenic values. To consistently evaluate its lands within their regional context, BLM developed the Visual Resource Management (VRM) program. BLM uses the VRM process to manage the scenic quality of the landscape and reduce the impact of development on the scenery. The BLM manages landscapes based on visual indicators defined in the Visual Resource Inventory Handbook H-8410-1. Using the indicators, BLM assigns land areas to four VRM management classes:

- Class I: The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- Class II: The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract attention from the casual observer.
- Class III: The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer.
- Class IV: The objective of this class is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention.

Potential air quality impacts would not stem directly from visual resources management actions, but indirectly from changes in resource use activities on an area of land, and their associated emissions, that

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result from changes in the VRM Class assignment of the area. VRM Class I is the most restrictive and, in general, is expected to result in the lowest level of emissions from resource use activities and the associated management actions. VRM Classes II, III, and IV are progressively less restrictive. VRM Class IV, in general, is expected to result in the highest level of emissions from resource use activities and the associated management actions.

Table 12 presents visual resources management impacts in terms of acreage allocated to each VRM Class. For the specific management actions included in Alternatives A and E, see the Visual Resources section in Chapter 2 of the Proposed RMP.

Table 12. Land Use Allocations for Visual Resources Management for the Lower Sonoran Decision Area

VRM Class	Alternative (BLM Acres)				
	A (No Action)	B	C	D	E (Proposed RMP)
Class I	91,800	91,800	91,800	91,800	91,800
Class II	116,300	64,800	387,800	622,400	65,500
Class III	279,600	551,000	385,600	192,000	554,800
Class IV	442,500	222,600	65,000	24,000	218,100

Source: BLM 2012

BLM Bureau of Land Management
RMP Resource Management Plan
VRM Visual Resource Management

Table 12 shows that under Alternative E there would be a relatively large increase in VRM Class III acreage, a relatively large decrease in VRM Class IV acreage, and a smaller decrease in VRM Class II acreage, compared to Alternative A. The net effect of Alternative E would be a shift in acreage from less-restrictive to more-restrictive VRM classes. As noted above, such a shift is expected to result in lower potential for resource use activities that would increase emissions. Land use allocations and activity indicated in Table 12 for the entire LSDA are expected to be representative for the portions of the LSDA within the NAAs. Because there would be no potential for emissions increases in the NAAs due to VRM Class allocations under Alternative E, visual resources management actions in the LSDA do not require further conformity evaluation.

3.2.1.8. WILDLAND FIRE MANAGEMENT

The RMP indicates that air quality impacts from fire and fuels management would not differ by alternative. This suggests that no difference in emissions associated with fire and fuels management actions would be expected between Alternative E and Alternative A. Because there would be no potential for emissions increases due to fire and fuels management, fire and fuels management actions in the LSDA do not require further conformity evaluation.

3.2.1.9. WILDLIFE AND SPECIAL STATUS SPECIES

BLM manages vegetation and wildlife populations in the Planning Area to ensure high-quality wildlife habitat and to protect water resources and watershed conditions. Management actions and other activities on acreage managed as wildlife habitat area generally are subject to greater development

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restrictions, resulting in decreased potential for emissions compared to areas not managed as wildlife habitat areas. A possible exception, discussed below, is small-scale construction of facilities such as wildlife water developments (e.g., catchments or springs) to support wildlife populations.

Table 13 presents potential habitat management impacts in terms of acreage managed as wildlife habitat areas. For the specific management actions included in Alternatives A and E, see the Wildlife and Special Status Species section in Chapter 2 of the Proposed RMP.

Table 13. Key Land Use Allocations for Wildlife Habitat for the Lower Sonoran Decision Area

Wildlife Habitat Area	Alternative (BLM Acres)				
	A (No Action)	B	C	D	E (Proposed RMP)
Batamote Mountains	0	0	62,900	0	0
Cuerda de Lena	0	0	58,500	0	0
Gila Bend Mountains	0	0	255,700	255,700	255,700
Saddle Mountain	0	0	48,800	0	0
<i>Total</i>	<i>0</i>	<i>0</i>	<i>425,900</i>	<i>255,700</i>	<i>255,700</i>

Source: BLM 2012

BLM Bureau of Land Management
RMP Resource Management Plan

Table 13 shows that the number of acres managed as wildlife habitat areas would be greater for Alternative E than for Alternative A. The number of acres available can be used as a proxy for surface-disturbing activities, and therefore emissions that could occur. Land use allocations and activity indicated in Table 13 for the entire LSDA are expected to be representative for the portions of the LSDA within the NAAs. As a result, effects in the NAAs of wildlife habitat management actions, and their expected emissions, would be less with Alternative E than with Alternative A.

Although the Proposed RMP mentions the possibility of construction of new wildlife waters under Alternative E that are not included under Alternative A, BLM staff estimate that this possibility is remote and no construction of new wildlife waters is planned or expected to occur. Consequently, no emissions increases are anticipated as a result of construction of new wildlife waters.

Because there would be no potential for emissions increases in the NAAs due to Alternative E, priority wildlife and special species management actions in the LSDA do not require further conformity evaluation.

3.2.2. SONORAN DESERT NATIONAL MONUMENT DECISION AREA

3.2.2.1. LANDS AND REALTY

BLM is authorized under several authorities to acquire, dispose of, convey, and lease portions of the federally owned land it manages for the benefit of the national interest. As discussed in Section 3.2.1.1 of this report for the LSDA, potential air quality impacts in the SDNM would stem primarily from land use allocations or actions that would prevent the authorization of ROWs, leases, and land tenure actions in certain resource-rich areas.

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Table 14 presents lands and realty impacts in terms of acreage avoided and excluded for LUAs and land tenure adjustments. For the specific management actions included in Alternatives A and E, see the Lands and Realty section in Chapter 2 of the Proposed RMP.

Table 14. Key Lands and Realty Allocations for the SDNM

Decision	Alternative				
	A (No Action)	B	C	D	E (Proposed RMP)
Land Use Authorizations: Utility-scale Renewable Energy Avoidance and Exclusion Areas (acres)					
The SDNM is excluded from any potential utility-scale renewable energy development within all alternatives.					
Land Use Authorizations: Utility Corridors (Width/Length miles)					
Santa Rosa-Gila Bend	1.0/18.1	1.0/18.1	0.5*/17.9*	N/A	N/A
Interstate 8	1.0/21.1	1**/21.1	0.5*/21.1*	N/A	N/A
Tucson Electric Power	1.0/7.4	1.0/7.4	N/A	N/A	N/A
Total Corridor Acres	32,900	32,900	14,900	N/A	N/A
Multiuse utility corridor widths and lengths are measured as they cross BLM-administered lands only. Multiuse utility corridors are simply referred to as utility corridors within Alternative A and would not include transportation facilities.					
*Indicates that the multiuse utility corridor will only permit underground facilities.					
**Indicates that a portion of the multiuse utility corridor narrows to a 0.5-mile wide (south of the Interstate 8 highway centerline) as it passes along the length of the South Maricopa Mountains Wilderness.					
Land Use Authorizations: Avoidance and Exclusion Areas (acres)					
LUA Avoidance Area	N/A	293,600	181,400	N/A	N/A
LUA Exclusion Area	164,900	192,800	305,000	486,400	486,400
Land Use Authorizations: Communication Sites					
No communication sites are designated in the SDNM.					
Land Tenure (acres)					
Disposal	No lands are designated as being suitable for disposal within the monument. Exchanges for lands within the SDNM for other private lands within the SDNM's boundaries would be permitted if they further improve the management of SDNM objects and present no net loss to existing objects that will be impacted by the exchange.				
R&PP Leased	No lands are presently leased under the R&PP Act within the SDNM, therefore no acres were identified.				
Acquisition	Private and state lands would be acquired as available and funds allow, on a willing seller, willing buyer basis.				
Retention	All 486,400 acres of public land would be retained.				

Source: BLM 2012

BLM Bureau of Land Management
 LSDA Lower Sonoran Decision Area
 LUA Land Use Authorization
 R&PP Recreation and Public Purpose
 RMP Resource Management Plan
 SDNM Sonoran Desert National Monument

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Table 14 shows that the number and total area of designated utility corridors would be less for Alternative E than for Alternative A, and the number of acres managed as LUA avoidance or exclusion areas would be greater for Alternative E compared to Alternative A. The number of acres under the various allocations can be used as a proxy for the amount of construction and other activity, and therefore emissions that could occur. Land use allocations and activity indicated in Table 14 for the entire SDNM are expected to be representative for the portions of the SDNM within the NAAs. As a result, effects in the NAAs of lands and realty actions with Alternative E are expected to be less than with Alternative A. Because there would be no potential for emissions increases in the NAAs due to Alternative E, lands and realty actions in the SDNM do not require further conformity evaluation.

3.2.2.2. LIVESTOCK GRAZING MANAGEMENT

The livestock grazing management program in the Planning Area carries out the intent of the Taylor Grazing Act of 1934, the Federal Land Policy and Management Act of 1976, and the Public Rangelands Improvement Act of 1978. As discussed in Section 3.2.1.2 of this report for the LSDA, potential air quality impacts in the SDNM would stem primarily from developing or maintaining livestock facilities, rangeland improvements, or other activities involving construction and surface disturbance. Management actions also may affect forage levels and the degree of human disturbance of livestock during recreational activities.

Table 15 presents livestock grazing impacts in terms of acreage and AUMs. For the specific management actions included in Alternatives A and E, see the Livestock Grazing section in Chapter 2 of the Proposed RMP.

Table 15. Key Land Use Allocations for Livestock Grazing for the SDNM

Allocation (acres)	Alternatives				
	A (No Action)	B (Reduced Perennial)	C (Perennial Only/ No Ephemeral)	D (Closed)	E (Proposed RMP)
Available	252,500	243,500	207,500	0	156,330
Unavailable	233,900	242,900	278,900	486,400	330,070
Total Acres within SDNM	486,400	486,400	486,400	486,400	486,400
Total Proposed (AUMs ¹)	8,703	5,321 ²	7,092	0	3,114

¹ AUMs shown are prorated and reduced by 7,884 from the total permitted use due to the allotment closures south of I-8. In Alternatives B and E, AUMs were further prorated using current data compared to forage allocations suggested in the Lower Gila South RMP Resource Protection Alternative.

² Ephemeral AUMs are permitted on a case-by-case basis pursuant to the Special Ephemeral Rule.

Source: BLM 2012

AUM Animal Unit Month
RMP Resource Management Plan
SDNM Sonoran Desert National Monument

Table 15 shows that the number of acres available for grazing and the number of AUMs would be less under Alternative E than under Alternative A. The number of acres available and the total AUMs can be used as a proxy for the construction and other activity, and therefore emissions that could occur. Land use allocations and activity indicated in Table 15 for the entire SDNM are expected to be representative for the portions of the SDNM within the NAAs. As a result, effects in the NAAs from livestock grazing

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actions would be less under Alternative E than under Alternative A, and expected emissions in the NAAs under Alternative E would also be less than under Alternative A. Because there is no potential for emissions increases in the NAAs due to Alternative E, livestock grazing actions in the SDNM do not require further conformity evaluation.

3.2.2.3. MINERALS MANAGEMENT

The RMP indicates that the SDNM is withdrawn from new minerals development under all alternatives. The withdrawal was established in the proclamation that established the SDNM. This indicates that no difference in emissions associated with minerals management actions would be expected between Alternative E and Alternative A. Because there would be no potential for emissions increases due to minerals management, minerals management actions in the SDNM do not require further conformity evaluation.

3.2.2.4. RECREATION MANAGEMENT

Introduction

Recreational experiences, setting, and activities in the Planning Area range from areas with primitive, roadless qualities to more modified and roaded natural areas. As discussed in Section 3.2.1.4 of this report for the LSDA, potential air quality impacts would result primarily from management actions that affect recreational resources and travel across public lands. Potential air quality impacts associated with travel management in the SDNM are discussed separately below. Table 16 presents recreation management impacts in terms of acreage in managed areas. For the specific management actions included in Alternatives A and E, see the Recreation Management section in Chapter 2 of the Proposed RMP.

Table 16. Key Land Use Allocations for Recreation Management for the SDNM

Recreation Market Strategy	Alternative (BLM acres)				
	A (No Action)	B	C	D	E (Proposed RMP)
Gila Trails	SRMA	Portions of Juan Bautista de Anza NHT RMZ			
Sonoran Desert	--	ERMA	ERMA	UL	ERMA
<i>Desert Back Country RMZ</i>	--	<i>RMZ</i>	<i>RMZ</i>	<i>UL</i>	<i>RMZ</i>
<i>Juan Bautista de Anza NHT RMZ</i>	--	<i>RMZ</i>	<i>RMZ</i>	<i>UL</i>	<i>RMZ</i>

Source: BLM 2012

- BLM Bureau of Land Management
- ERMA Extensive Recreation Management Area
- NHT National Historic Trail
- RMP Resource Management Plan
- RMZ Recreation Management Zone
- SRMA Special Recreation Management Area
- SDNM Sonoran Desert National Monument
- UL Undesignated Land

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Description of Impacts

Table 16 shows that the areas in the SDNM managed for recreation under Alternative E are not managed under Alternative A, with the exception of Gila Trails which is managed for recreation under both alternatives. This indicates that the total number of acres in managed recreation areas would be greater for Alternative E than for Alternative A. Some of the management actions that BLM may take in these areas may involve activities that could generate emissions, such as construction of recreational facilities. BLM evaluated each recreation management action proposed under Alternative E to identify all reasonably foreseeable activities that could lead to increased emissions in NAAs compared to Alternative A.

The Proposed RMP describes the specific planned or reasonably foreseeable management actions that would involve construction or similar activities. BLM identified the actions that could occur in the NAAs under Alternative E that would not occur under Alternative A. The recreation management actions that could increase emissions are construction of pulloff areas to allow vehicles to park next to existing roads, improvement of existing staging areas, and increased maintenance on roads used for visitor recreation. The improvements to the existing staging areas would include laying gravel on the parking lots and access roads and “hardening” or stabilizing the surface to reduce dust generation. These actions would be located at sites in the Anza NHT corridor and would consist of the following:

- Construct 3 acres of pulloffs;
- Improve two 1.5-acre existing staging areas; and
- Increase maintenance levels on 12 miles of roadway.¹

BLM quantified potential emission increases for these actions.

Quantification of Emissions

Not all of the recreation actions in the SDNM would necessarily be implemented, nor would they necessarily be implemented in the same year but they are identified as reasonably foreseeable based on discussions with BLM specialists. In order to provide a conservative analysis for conformity purposes, emissions were estimated for these facilities assuming that all would be implemented in the same calendar year. In reality, they could be implemented at any time during the RMP planning period based on need and available funding.

Construction, improvement, and maintenance activities would use the same equipment and methods that are discussed in Section 3.2.1.4 of this report for the LSDA. The emissions analysis associated with recreation actions in the SDNM used the same assumptions and methods as discussed in Section 3.2.1.4 for the LSDA. Due to the relatively small size of each facility, construction and improvement activities would be expected to occur over a period of no more than a few weeks per site. Road maintenance activities would be scheduled as needed or on a continuing basis.

¹ The General Conformity Rule contains an exemption for “Routine maintenance and repair activities, including repair and maintenance of administrative sites, roads, trails, and facilities.” (40 CFR § 93.153[c][iv].) At present it is unknown whether BLM will plan this maintenance such that it would be considered routine. For conservatism the proposed increase in maintenance was treated as a non-routine, but annual, activity subject to conformity.

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Table 17 lists the estimated construction emissions for the reasonably foreseeable activities. PM₁₀ emissions include both exhaust and fugitive PM. PM_{2.5} emissions were not estimated because no construction would occur in PM_{2.5} NAAs. Unlike one-time construction emissions, emissions from the increased road maintenance would recur according to BLM's maintenance schedule and so are included in the estimates of recurring emissions presented under Travel Management below rather than in Table 17.

Table 17. Estimated Construction Emissions (tons) for Site and Road Development in the Anza NHT Corridor

Description	CO	NO _x	SO ₂	VOC	PM ₁₀
Construct pulloffs: 3 acres total area	6.20	5.07	0.004	0.71	0.79
Improve existing staging areas: two 1.5-acre areas	0.09	0.09	0.0002	0.01	0.26
<i>Total</i>	<i>6.29</i>	<i>5.17</i>	<i>0.004</i>	<i>0.72</i>	<i>1.05</i>

Note: Data may not sum to total due to rounding.

CO carbon monoxide
 NHT National Historic Trail
 NO_x nitrogen oxides
 PM particulate matter
 SO₂ sulfur dioxide
 VOC volatile organic compound

BLM anticipates that the presence of these facilities and improvements may, by making the area more attractive for recreation, contribute to an increase in visitation. Because of their basis in vehicle travel, emissions due to increased visitation are considered under the Travel Management program area below.

3.2.2.5. SPECIAL DESIGNATIONS MANAGEMENT

Special Area Designations describe areas that have special values that warrant or require special management or protection, as discussed in Section 3.2.1.5 of this report. Seventeen special designation areas currently exist within the Planning Area. Six occur within the SDNM Decision Area and include the SDNM itself plus the North and South Maricopa Mountains and Table Top wildernesses; Vekol Valley Grasslands ACEC; and Juan Bautista de Anza NHT. Impacts would stem primarily from management of resource values associated with existing or proposed ACECs.

Table 18 presents potential impacts in terms of acreage managed under ACECs. For the specific management actions included in Alternatives A and E, see the ACEC section in Chapter 2 of the Proposed RMP.

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Table 18. Key Land Use Allocations for Special Designations in the SDNM: ACECs

ACEC Name	Alternative (BLM Acres)				
	A (No Action)	B	C	D	E (Proposed RMP)
Vekol Valley Grasslands	3,500	No ACEC designation			

Source: BLM 2012

ACEC Area of Critical Environmental Concern
BLM Bureau of Land Management
RMP Resource Management Plan
SDNM Sonoran Desert National Monument

Table 18 shows that under Alternatives B-E the Vekol Valley Grasslands is not managed as an ACEC. The Vekol Valley Grasslands is not located within an NAA, and accordingly actions with respect to the Vekol Valley Grasslands are not subject to the General Conformity Rule. Because there would be no potential for emissions increases in the NAAs due to Alternative E, special designations management actions in the SDNM do not require further conformity evaluation.

3.2.2.6. TRAVEL MANAGEMENT

Introduction

Travel management strives to provide manageable access to public lands while balancing resource protection. As discussed in Section 3.2.1.6 of this report for the LSDA, the allocation of areas as open, closed or limited to OHVs directs the management approach for vehicular travel on public lands.

Description of Impacts

Table 19 presents travel management impacts in terms of acreage under different management regimes. For the specific management actions included in Alternatives A and E, see the Travel Management section in Chapter 2 of the Proposed RMP.

Table 19. Key Travel Management Allocations for the SDNM

Decision	Alternative (BLM acres)				
	A (No Action)	B	C	D	E (Proposed RMP)
Open	0	0	0	0	0
Closed	161,200	157,700	157,700	313,600	157,700
Limited to existing roads and trails	325,200	0	0	0	0
Limited to Designated Routes	0	328,700	328,700	172,800	328,700
<i>Total</i>	<i>486,400</i>	<i>486,400</i>	<i>486,400</i>	<i>486,400</i>	<i>486,400</i>

Source: BLM 2012

BLM Bureau of Land Management
RMP Resource Management Plan
SDNM Sonoran Desert National Monument

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Table 19 shows that although the number of acres closed to OHV travel and limited to existing roads and trails would be less for Alternative E than for Alternative A, the number of acres limited to designated routes would be much greater under Alternative E than under Alternative A. Although the increase in acreage limited to designated routes suggests that, in general, the potential for emissions would be lower under Alternative E than Alternative A, BLM expects that the planned improvements to existing facilities and increased road maintenance could lead to increased visitation in the Anza NHT RMZ.

Quantification of Emissions

It is reasonably foreseeable that the improved facilities and road maintenance in the Anza NHT RMZ could lead to increases in visitation and associated emissions. To estimate the increase in emissions in the Anza NHT RMZ as a result of increased visitation, BLM used the same method as described in Section 3.2.1.6 of this report. Based on comparison of conditions and usage patterns in the Boulders OHV Area and the Anza NHT RMZ, BLM staff estimated the increase in visitation and vehicle use, and the resulting emissions increases, that would be expected in the Anza NHT RMZ under Alternative E. OHV races would not be permitted in the SDNM under Alternative E so there would be no emissions resulting from OHV races in the NAAs of the SDNM.

Table 20 lists the estimated recurring emissions for the reasonably foreseeable activities. PM₁₀ emissions include both exhaust and fugitive PM. PM_{2.5} emissions were not estimated because no increased visitation is projected to occur in PM_{2.5} NAAs. Road maintenance emissions are assumed to occur annually because BLM’s maintenance schedule is not yet known.

Table 20. Estimated Recurring Emissions (tons per year) due to Increased Visitation and Road Maintenance in the Anza NHT RMZ

Description	CO	NO _x	SO ₂	VOC	PM ₁₀
Increased visitation (visitor vehicle use)	0.42	0.08	0.00	0.01	2.77
Increased road maintenance (construction equipment and vehicles) ¹	0.84	0.05	0.00	0.54	9.75
<i>Total</i>	<i>1.26</i>	<i>0.14</i>	<i>0.001</i>	<i>0.56</i>	<i>12.52</i>

¹The General Conformity Rule contains an exemption for “Routine maintenance and repair activities, including repair and maintenance of administrative sites, roads, trails, and facilities.” (40 CFR § 93.153[c][iv].) At present it is unknown whether the Bureau of Land Management will plan this maintenance such that it would be considered routine. For conservatism the proposed increase in maintenance was treated as a non-routine, but annual, activity subject to conformity.

- CO carbon monoxide
- NHT National Historic Trail
- NO_x nitrogen oxides
- PM particulate matter
- RMZ Recreation Management Zone
- SO₂ sulfur dioxide
- VOC volatile organic compound

3.2.2.7. VISUAL RESOURCES MANAGEMENT

Potential air quality impacts would not result directly from visual resources management actions, but indirectly from changes in resource use activities on an area of land, and their associated emissions, that result from changes in the VRM Class assignment of the area. VRM Class I is the most restrictive and, in general, is expected to result in the lowest level of emissions from resource use activities. VRM Classes

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II, III, and IV are progressively less restrictive. VRM Class IV, in general, is expected to result in the highest level of emissions from resource use activities.

Table 21 of this report presents Visual Resources management impacts in terms of acreage assigned to each VRM Class. For the specific management actions included in Alternatives A and E, see the Visual Resources section in Chapter 2 of the Proposed RMP.

Table 21. Land Use Allocations for Visual Resources Management for the SDNM

VRM Class	Alternative (BLM Acres)				
	A (No Action)	B	C	D	E (Proposed RMP)
Class I	158,700	158,700	158,700	457,900	158,700
Class II	91,600	219,000	267,300	28,500	246,500
Class III	116,400	108,700	60,400	None	81,200
Class IV	119,700	0	0	0	0

Source: BLM 2012

BLM Bureau of Land Management
RMP Resource Management Plan
SDNM Sonoran Desert National Monument
VRM Visual Resource Management

Table 21 shows that under Alternative E there would be a relatively large increase in VRM Class II acreage, a smaller decrease in VRM Class III acreage, and a large decrease in VRM Class IV acreage, compared to Alternative A. The net effect of Alternative E would be a shift in acreage from less-restrictive to more-restrictive VRM classes. This shift is expected to result in lower potential for resource use activities that would increase emissions. Land use allocations and activity indicated in Table 21 for the entire SDNM are expected to be representative for the portions of the SDNM within the NAAs. As a result, because there would be no potential for emissions increases in the NAAs due to VRM Class assignments under Alternative E, visual resources management actions in the SDNM do not require further conformity evaluation.

3.2.2.8. WILDLAND FIRE MANAGEMENT

The Proposed RMP indicates that air quality impacts from fire and fuels management would not differ by alternative. This suggests that no difference in emissions associated with fire and fuels management actions would be expected between Alternative E and Alternative A. Because there would be no potential for emissions increases due to fire and fuels management, fire and fuels management actions in the SDNM do not require further conformity evaluation.

3.2.2.9. WILDLIFE AND SPECIAL STATUS SPECIES

BLM manages vegetation and wildlife populations in the Planning Area to ensure high-quality wildlife habitat and to protect water resources and watershed conditions. Management actions and other activities on acreage managed as wildlife habitat areas generally are subject to greater development restrictions resulting in decreased potential for emissions compared to areas not managed as wildlife habitat areas. The Air Quality section in Chapter 4 of the Proposed RMP indicates that the air quality impacts of Alternative E in the SDNM would be essentially the same as those of Alternative A.

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Table 22 presents potential habitat management impacts in terms of acreage managed as wildlife habitat area. For the specific management actions included in Alternatives A and E, see the Wildlife and Special Status Species section in Chapter 2 of the Proposed RMP.

Table 22. Key Land Use Allocations for Wildlife Habitat for the SDNM

Wildlife Habitat Area	Alternative (BLM Acres)				
	A (No Action)	B	C	D	E (Proposed RMP)
Wildlife Habitat Areas	0	0	0	0	0

Source: BLM 2012

BLM Bureau of Land Management
RMP Resource Management Plan
SDNM Sonoran Desert National Monument

Table 22 shows that the number of acres managed as wildlife habitat areas in the SDNM would be zero for both Alternative E and Alternative A. This suggests that no difference in emissions associated with priority wildlife and habitat management actions would be expected between Alternative E and Alternative A. Because there would be no potential for emissions increases due to priority wildlife and habitat management with Alternative E, priority wildlife and habitat management actions in the SDNM do not require further conformity evaluation.

4. RESULTS OF THE ANALYSIS

Table 23 summarizes the results of the conformity evaluation for activities under the Proposed RMP that are anticipated to cause increased emissions. PM₁₀ emissions include both fugitive and exhaust PM. PM_{2.5} emissions were not quantified because no net emissions increases attributable to the Proposed RMP would occur in the West Central Pinal PM_{2.5} NAA.

Table 23. Summary of Net Emissions for Conformity Evaluation

Planning Area	Activity Location	Description	CO	NO _x	SO ₂	VOC	PM ₁₀
Construction (tons)							
LSDA	Buckeye Hills East RMZ	Construct staging areas: five 6-acre and one 10-acre, total 40 acres	25.98	21.52	0.02	2.94	24.79
		Construct road: 4 miles, 30-foot width	6.07	5.13	0.0046	0.69	3.94
		Construct trails: 5 miles single-track	0.04	0.01	0.0001	0.001	0.0003
SDNM	Anza NHT RMZ	Construct pulloffs: 3 acres total	6.20	5.07	0.004	0.71	0.79
		Improve existing staging areas: two 1.5-acre areas	0.09	0.09	0.0002	0.01	0.26
<i>Total construction</i>			<i>38.38</i>	<i>31.82</i>	<i>0.02</i>	<i>4.36</i>	<i>29.78</i>

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Table 23. Summary of Net Emissions for Conformity Evaluation

Planning Area	Activity Location	Description	CO	NO _x	SO ₂	VOC	PM ₁₀
Recurring Activities (tons/year)							
LSDA	Buckeye Hills East RMZ	Increased visitation	2.94	0.40	0.003	0.31	7.37
		OHV Races	0.84	0.05	0.001	0.54	9.75
SDNM	Anza NHT RMZ	Increased visitation	0.42	0.08	0.00	0.01	2.77
		Increase road maintenance: 12 miles	0.84	0.05	0.00	0.54	9.75
Total recurring activities			5.45	1.55	.005	1.01	24.92
Total Emissions and Comparison to Conformity Thresholds							
Sum of construction and recurring emissions (tons, if all activities occur in one year)			43.83	33.37	0.03	5.36	54.70
Applicable general conformity thresholds (tons/year)			100	100	100	100	70

- CO carbon monoxide
- LSDA Lower Sonoran Decision Area
- NHT National Historic Trail
- NO_x nitrogen oxides
- OHV Off-highway vehicle
- PM particulate matter
- RMZ Recreation Management Zone
- SDNM Sonoran Desert National Monument
- SO₂ sulfur dioxide
- VOC volatile organic compound

The “Total construction” sum represents the one-time emissions that would occur if all actions were completed in one year, which is a conservative assumption (represents a worst-case scenario). As indicated in Table 23, total construction emissions would be less than the applicable conformity thresholds for all applicable criteria pollutants. The “Total recurring activities” sum, which represents annual emissions, is also less than the conformity thresholds. The “Sum of construction and recurring emissions” in Table 23 represents the emissions that would occur if all projects were completed simultaneously *and* visitation increased immediately to the projected levels, which represents a worst-case scenario, and demonstrates that net emissions would be less than the conformity thresholds. Appendix A provides further detail on the emissions estimates developed for the conformity analysis.

5. CONCLUSION

The general conformity evaluation performed for the Proposed RMP/Final EIS demonstrates that the net emissions increases attributable to the Proposed RMP (Alternative E) compared to Alternative A (No Action) would be less than the general conformity *de minimis* thresholds, even under a worst-case scenario. Accordingly, the Proposed RMP conforms to the applicable SIPs. As a result, no further conformity evaluation is necessary and a conformity determination is not required.

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Appendix A

Emissions Estimates

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I. Pad Construction – Dust

Inputs for On-Site Dust Computations Local Construction (per acre)

1 week to build 3.64 acres						
	days	acres				
	5	3.64	1.373626374	days/acre	road	
			4	days/acre	area	
Construction Activity TSP Emission Factor ¹	Construction Activity Duration ²	Factor for 10 hr days vs 12 hr days	Emission Control Efficiency	TSP Emissions (Controlled)	PM ₁₀ Emissions (controlled) ³	
(tons/acre-month)						
(tons/acre-30days)	days/acre	10	(%)	T/acre ²	T/acre ²	
1.2	1.37	0.833	50	0.02	0.01	road
1.2	4.00	0.833	50	0.07	0.02	area

¹ EPA AP-42, Section 13.2.3, "Heavy Construction Operations"; TSP = total suspended particulates (12 hour day).

² 5 days/3.64 acres = 0.0669 months/acre

1.3763 days/acre, assuming 10 hour days.

³ EPA AP-42, Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM₁₀ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

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2. Onsite Exhaust

**Inputs for Onsite
Site/Pad Construction – Heavy Equipment Exhaust Emissions**

Heavy Equipment	Engine Horsepower (hp)	Number Required	Operating Load Factor ¹	Pollutant Emission Factor ² (g/hp-hr)					Pollutant Emissions (g/hr)					Pollutant Emissions (T/hr)				
				CO	NO _x	SO ₂	VOC	PM ₁₀	CO	NO _x	SO ₂	VOC	PM ₁₀	CO	NO _x	SO ₂	VOC	PM ₁₀
Backhoe	100	1	1	8.5	6.9	0.0047	0.97	0.4	850	690	0.47	97	40	0.0009361	0.0007599	0.0000005	0.0001068	0.0000441
Roller	100	1	1	8.5	6.9	0.0047	0.97	0.4	850	690	0.47	97	40	0.0009361	0.0007599	0.0000005	0.0001068	0.0000441
Scraper	600	1	1	8.5	6.9	0.0047	0.97	0.4	5100	4140	2.82	582	240	0.0056167	0.0045595	0.0000031	0.0006410	0.0002643
Grader	300	1	1	8.5	6.9	0.0047	0.97	0.4	2550	2070	1.41	291	120	0.0028084	0.0022797	0.0000016	0.0003205	0.0001322
Total Heavy Equipment Tailpipe Emissions													0.0102974	0.0083590	0.0000057	0.0011751	0.0004846	

Four days assumes a 12 hours day

¹Assumed to be 1 because no data available (conservative).

² Emission factors based on the fact that there is a mix of Tier 0, 1 and 2 equipment operating in the field. Therefore, Tier 1 emission factors are conservatively assumed for the life of project.

SO₂ emissions based on a sulfur balance and 15 ppm diesel fuel.

3. Traffic – Construction Dust

**Fugitive Dust from Heavy Equipment on Industrial Unpaved Roads (1a)
Emission Factors for Industrial Unpaved Roads ¹**

		Parameter	PM ₁₀	PM _{2.5}
E (lb/VMT) _{1a} =	$k (s/12)^a (W/3)^b$	k	1.5	0.15
		a	0.9	0.9
		b	0.45	0.45
Function/Variable Description		Assumed Value	Reference	
E = size-specific emission factor (lb/VMT)				
S = surface material silt content (%)		varies	EPA AP-42 Section 13.2.2, Table 13.2.2-1	
W = mean vehicle weight (tons)		Listed in the table below		
M = surface material moisture content (%)		2.0	EPA AP-42 Section 13.2.2	

¹ Source: EPA, AP-42 Volume I, Section 13.2.2 Unpaved Roads, Table 13.2.2-2, Nov. 2006

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**Fugitive Dust from Commuting Vehicles on Unpaved Roads (Ib)
Emission Factors for Publicly Accessible Unpaved Roads¹**

		Parameter	PM ₁₀	PM _{2.5}
$E \text{ (lb/VMT)}_{Ib} = \frac{k (s/12)^a (S/30)^d C}{(M/0.5)^c}$		k	1.8	0.18
		a	1	1
		d	0.5	0.5
		c	0.2	0.2
$E_{ext} = E (1 - P/365)$				
Function/Variable Description		Assumed Value	Reference	
E = size-specific emission factor (lb/VMT)				
E _{ext} = size-specific emission factor extrapolated for natural mitigation (lb/VMT)				
s = surface material silt content (%)		varies	EPA AP-42 Section 13.2.2, Table 13.2.2-1	
S = mean vehicle speed (mph)				
C = emission factor for 1980's vehicle fleet exhaust, brake wear, and tire wear (lb/VMT)	PM _{2.5}	0.0004	EPA AP-42 Section 13.2.2, Table 13.2.2-4	
	PM ₁₀	0.0005	EPA AP-42 Section 13.2.2, Table 13.2.2-4	
M = surface material moisture content (%)		2.0	EPA AP-42 Section 13.2.2	
P = Number of days precip per year		36	http://lwf.ncdc.noaa.gov/oa/climate/online/ccd/prcpdays.html	
CE = control efficiency of watering ²		50%		

¹ Source: EPA, AP-42 Volume I, Section 13.2.2 Unpaved Roads, Table 13.2.2-2, Nov. 2006

² Fitzpatrick, M. 1990. User's Guide: Emission Control Technologies and Emission Factors for Unpaved Road Fugitive Emissions, EPA/625/5-87/022. <http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=20008SFC>.

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Construction Vehicle Traffic Dust Emissions

Vehicle Type	Road Type	Dust Control Method ¹	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content ² (%)	Moisture Content ³ (%)	Vehicle Activity Data (Site-specific)				Emission Control Efficiency ⁵ (%)	PM ₁₀ Emission Factor ⁶ (lb/VMT)	PM _{2.5} Emission Factor ⁶ (lb/VMT)	PM ₁₀ Emissions ⁷ (controlled) (lb/VMT)
							Vehicle Count	Round Trips (RTs) (RT/pad)	RT Distance (miles)	Vehicle Miles Traveled (VMT) ⁴ (VMT/pad)				
Pickup, car, minivan, SUV (average) ⁸	Local	Chemical	5,000	35	10.95	2.4					85	1.30	0.13	0.19
	Resource	Water	5,000	20	10.95	2.4					50	1.27	0.13	0.64
Light Trucks - pick-up/tool	Local	Chemical	7,000	35	10.95	2.4					85	1.30	0.13	0.19
	Resource	Water	7,000	20	10.95	2.4					50	1.48	0.15	0.74
Shuttle-bus	Local	Chemical	10,000	35	10.95	2.4					85	1.30	0.13	0.19
	Resource	Water	10,000	20	10.95	2.4					50	1.74	0.17	0.87
Dump w/ bellydump	Local	Chemical	70,000	35	10.95	2.4					85	1.30	0.13	0.19
	Resource	Water	70,000	20	10.95	2.4					50	4.17	0.42	2.09
5-ton stake bed	Local	Chemical	10,000	35	10.95	2.4					85	1.30	0.13	0.19
	Resource	Water	10,000	20	10.95	2.4					50	1.74	0.17	0.87
Flatbed w/crane	Local	Chemical	35,000	35	10.95	2.4					85	1.30	0.13	0.19
	Resource	Water	35,000	20	10.95	2.4					50	3.05	0.31	1.53
Concrete Truck (average) ⁹	Local	Chemical	42,000	35	10.95	2.4					85	1.30	0.13	0.19
	Resource	Water	42,000	20	10.95	2.4					50	3.32	0.33	1.66
Heavy Truck (Water)	Local	Chemical	35,000	35	10.95	2.4					85	1.30	0.13	0.19
	Resource	Water	35,000	20	10.95	2.4					50	3.05	0.31	1.53

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Construction Vehicle Traffic Dust Emissions

Vehicle Type	Road Type	Dust Control Method ¹	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content ² (%)	Moisture Content ³ (%)	Vehicle Activity Data (Site-specific)				Emission Control Efficiency ⁵ (%)	PM ₁₀ Emission Factor ⁶ (lb/VMT)	PM _{2.5} Emission Factor ⁶ (lb/VMT)	PM ₁₀ Emissions ⁷ (controlled) (lb/VMT)
							Vehicle Count	Round Trips (RTs) (RT/pad)	RT Distance (miles)	Vehicle Miles Traveled (VMT) ⁴ (VMT/pad)				
Rig Haul Trucks	Local Road	Chemical	80,000	35	10.95	2.4					85	1.30	0.13	0.19
	Resource Road	Water	80,000	20	10.95	2.4					50	4.43	0.44	2.22
Total Unpaved Road Traffic Emissions (lb/pad)													13.88	

¹ Dust control methods include using water (resource road) or chemical (local road) as a dust suppressant along with vehicle restriction speed limit of 25 mph

² Silt content - used 10.95% for all

³ EPA AP-42, Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."

⁴ Calculated as Round Trips per Vehicle Type x Round Trip Distance. (Assume 4 miles local roads, 2 miles industrial)

⁵ EPA AP-42, Figure 13.2.2-2, "Watering control effectiveness for unpaved travel surfaces.", Fugitive Dust Handbook, Western Regional Air Partnership 2006, Chapter 6

⁶ EPA AP-42, Section 13.2.2 "Unpaved Roads", equations 1a and 1b

⁷ Calculated as lb/VMT x VMT/pad x control efficiency

⁸ Average assumed for car/minivan/SUV/pickup = 5,000 lb

⁹ Concrete truck - empty 26,000. Concrete 4,000/yd, 8 yd max. Average, 42,000 lbs

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4. Traffic – Recreational Dust

Recreational Use Dust Formulas

Vehicle Type	Road Type	Dust Control Method ¹	Average Vehicle Weight ² (lb)	Average Vehicle Speed ² (mph)	Silt Content ³ (%)	Moisture Content ⁴ (%)	Vehicle Count	Round Trips (RTs) (RT/pad)	RT Distance (miles)	Vehicle Miles Traveled (VMT) ⁵ (VMT/pad)	Emission Control Efficiency ⁶ (%)	PM ₁₀ Emission Factor ⁷ (lb/VMT)	PM _{2.5} Emission Factor ⁷ (lb/VMT)	PM ₁₀ Emissions ⁸ (controlled) (lb/VMT)
Primary Unpaved	Local	Chemical/water	4,311	36.75	10.95	2.4	1	1	1	1	50	1.33	0.12	0.66
Secondary Unpaved	Local	Water	4,336	19.25	10.95	2.4	1	1	1	1	0	0.96	0.12	0.96
Jeep Road	Local	Water	3,097	9	10.95	2.4	1	1	1	1	0	0.66	0.10	0.66
ATV Road	Local	Water	694	8	10.95	2.4	1	1	1	1	0	0.62	0.05	0.62
Motorcycle Trail	Local	Water	470	10	10.95	2.4	1	1	1	1	0	0.69	0.04	0.69
Total Unpaved Road Traffic Emissions (lb/pad)														3.59

equation 1b - commuting vehicles on unpaved roads

¹ Dust control methods include using water (resource road) or chemical (local road) as a dust suppressants

² Weighted average for vehicle weight*			
	Weight		Speed
Primary Unpaved	4311	lbs	36.75
Secondary Unpaved	4336	lbs	19.25
(Jeep road)	3097	lbs	9
(ATV trail)	694	lbs	8
(Motorcycle trail)	470	lbs	10

* EPA Dust formula assumptions rev0 – LSFO.xls

³ Weighted silt content - used 10.95% for all

⁴ EPA AP-42, Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."

⁵ Calculated as Round Trips per Vehicle Type x Round Trip Distance. (Assume 4 miles local roads, 2 miles industrial)

⁶ EPA AP-42, Figure 13.2.2-2, "Watering control effectiveness for unpaved travel surfaces.", Fugitive Dust Handbook, Western Regional Air Partnership 2006, Chapter 6

⁷ EPA AP-42, Section 13.2.2 "Unpaved Roads", equations 1a and 1b. Calculated as lb/VMT x VMT/pad x control efficiency

⁸ Calculated as lb/VMT x VMT/pad x control efficiency

5. Traffic – Dust Paved

Area Construction Traffic

$E = k (sL)^{0.91} (w)^{1.02}$ Equation source: AP-42 sec. 13.2.3, equation 1 Function/Variable Description E = emission factor in grams/vehicle-mile of travel k = particle size multiplier for PM ₁₀ in lb/VMT sL = surface loading in grams per meter squared W= average vehicle weight tons			
Values for PM ₁₀			
k (lb/VMT)	0.0022	for PM10	
sL (g/m ²)	0.2	for ADT of 500-5,000	
Vehicle Type	Average Vehicle Weight (lb)	sL (%)	PM ₁₀ Emission Factor (lb/VMT)
Pickup, car, minivan, SUV (average) ¹	5,000	0.2	0.0015
Light Trucks - pick-up/tool	7,000	0.2	0.0023
Shuttle-bus	10,000	0.2	0.0035
Dump w/ bellydump	70,000	0.2	0.0362
5-ton stake bed	10,000	0.2	0.0035
Flatbed w/crane	35,000	0.2	0.0158
Concrete Truck (average) ²	42,000	0.2	0.0196
Heavy Truck (Water)	35,000	0.2	0.0158
Rig Haul Trucks	80,000	0.2	0.0425

¹ Average assumed for car/minivan/SUV/pickup=5,000 lbs

² Concrete truck - empty 26,000. Concrete 4,000/yd, 8 yd max. Average, 42,000 lbs

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6. Traffic – Exhaust

**Emission Factors for Commuting Vehicles – MOVES
Emission Factors (gm/mile)**

Project Year 2013	NO_x	PM₁₀	SO₂	CO	VOC
Rural Restricted - LSDA					
Passenger Car/Truck - Gas	0.72	0.01	0.006	4.89	0.10
Passenger Car	0.41	0.01	0.005	3.22	0.06
Passenger Truck	1.04	0.02	0.007	6.56	0.15
Motorcycle	0.77	0.03	0.006	11.83	0.62
Light Commercial Truck - Diesel	2.53	0.16	0.005	1.45	0.26
School Bus/ (Shuttle Bus) - Diesel	7.36	0.35	0.009	1.72	0.35
Single Unit Long/Short Haul Truck - diesel	2.88	0.15	0.006	0.94	0.22
Combination Long/Short Haul Truck (gravel/equipment delivery) - diesel	9.01	0.38	0.015	1.74	0.28
Rural Unrestricted - SDNM - and trails in LSDA					
Passenger Car/Truck - Gas	0.62	0.02	0.006	3.20	0.10
Passenger Car	0.35	0.02	0.005	1.98	0.05
Passenger Truck	0.90	0.02	0.006	4.42	0.14
Motorcycle	0.75	0.03	0.005	11.81	0.73
Light Commercial Truck - Diesel	2.84	0.18	0.005	1.93	0.37
School Bus/ (Shuttle Bus) - Diesel	5.39	0.37	0.006	1.72	0.42
Single Unit Long/Short Haul Truck - diesel	5.39	0.37	0.006	1.72	0.42
Combination Long/Short Haul Truck (gravel/equipment delivery) - diesel	9.04	0.48	0.015	2.15	0.37

Source: EPA NONROAD model, 2008

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Emission Factors for Off-Road ATV

Vehicle Type	Class	Emission Factors (g/mi)							
		NO _x	PM ₁₀	PM _{2.5}	SO _x	CO	VOC	CO ₂	CH ₄
2-Stroke ATV	R12S	0.25	1.86	1.71	0.03	47.81	48.72	140.15	0.42

Source: EPA NONROAD model, 2008

7. Site Preparation/Staging Areas – Lower Sonoran Decision Area

Pad Construction – Dust
On-site Emissions - Onsite Heavy Equipment – Dust

Area	Size (acres)	Number of Sites	Operation (%)	TSP Emissions (Controlled) T/acre ²	PM ₁₀ Emissions (controlled) T/acre ²	TSP Emissions (Controlled) T/acre ²	PM ₁₀ Emissions (controlled) T/acre ²
LSDA - Large Staging Area	13.64	1	100	0.07	0.02	12.40	4.47
LSDA - Small Staging Area	9.64	5	100	0.07	0.02	30.98	11.15
Total:						43.38	15.62

Onsite Exhaust
Tail Pipe Emissions – Onsite Heavy Equipment

	Pollutant Emissions (T/hr)									
	CO	NO _x	SO ₂	VOC	PM ₁₀					
Total Heavy Equipment Tailpipe Emissions	0.0103	0.0084	0.0000	0.0012	0.0005					
						T/area				
Area	Size (acres)	Number of Sites	Operation (%)	Hours/acre ¹	Hours	CO	NO _x	SO ₂	VOC	PM ₁₀
LSDA - Large Staging Area	13.64	1	100	40	545.6	5.62	4.561	0.003	0.641	0.264
LSDA - Small Staging Area	9.64	5	100	40	1928	19.85	16.116	0.011	2.266	0.934
Total:						25.47	20.677	0.014	2.907	1.199

¹ Each Piece of equipment needs 10 hours /acre and there are 4 of them

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Traffic – Dust – Large Staging Area

Vehicle Type	Road Type	Dust Control Method	Vehicle Count	Vehicles/site	RT Distance	Vehicle Miles Traveled (VMT) ¹	PM ₁₀ Emissions (controlled)	PM _{2.5} Emissions (controlled)	PM ₁₀ Emissions (controlled)	PM _{2.5} Emissions (controlled)
			Not used	(RT/staging areas)	(miles)	(VMT/all staging areas)	(lb/VMT)	(lb/VMT)	(lb/all staging areas)	(lb/all staging areas)
Commuter Vehicle	Local	Chemical	1	273	4	1091	0.19	0.02	212.11	21.16
	Resource	Water	1	273	2	546	0.64	0.06	347.15	34.71
Light Trucks - pick-up/tool	Local	Chemical	1	55	4	218	0.19	0.02	42.42	4.23
	Resource	Water	1	55	2	109	0.74	0.07	80.78	8.08
Shuttle-bus	Local	Chemical	1	55	4	218	0.19	0.02	42.42	4.23
	Resource	Water	1	55	2	109	0.87	0.09	94.84	9.48
Dump w/ bellydump	Local	Chemical	1	252	4	1008	0.19	0.02	196.03	19.56
	Resource	Water	1	252	2	504	2.09	0.21	1,052.04	105.20
5-ton stake bed	Local	Chemical	1	2	4	8	0.19	0.02	1.59	0.16
	Resource	Water	1	2	2	4	0.87	0.09	3.56	0.36
Flatbed w/crane	Local	Chemical	1	1	4	4	0.19	0.02	0.78	0.08
	Resource	Water	1	1	2	2	1.53	0.15	3.05	0.31
Concrete Truck	Local	Chemical	1	3	4	11	0.19	0.02	2.12	0.21
	Resource	Water	1	3	2	5	1.66	0.17	9.05	0.90
Water Truck	Local	Chemical	1	55	4	218	0.19	0.02	42.42	4.23
	Resource	Water	1	218	2	436	1.53	0.15	666.65	66.66
Rig Haul Trucks	Local	Chemical	1	8	4	32	0.19	0.02	6.22	0.62
	Resource	Water	1	8	2	16	2.22	0.22	35.45	3.54
									2,838.70	283.74
							Total (tons):	Tons - Large:	1.42	0.14

¹ VMT = vehicles per site *round trip distance over all site prep areas

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Traffic – Dust – Small Staging Area

Vehicle Type	Road Type	Dust Control Method	Vehicle Count	Vehicles/site	RT Distance	Vehicle Miles Traveled (VMT) ¹	PM ₁₀ Emissions (controlled)	PM _{2.5} Emissions (controlled)	PM ₁₀ Emissions (controlled)	PM _{2.5} Emissions (controlled)
			Not used	(RT/staging areas)	(miles)	(VMT/all staging areas)	(lb/VMT)	(lb/VMT)	(lb/all staging areas)	(lb/all staging areas)
Commuter Vehicle	Local	Chemical	1	964	4	3856	0.19	0.02	749.55	74.77
	Resource	Water	1	964	2	1928	0.64	0.06	1,226.72	122.67
Light Trucks - pick-up/tool	Local	Chemical	1	193	4	771	0.19	0.02	149.91	14.95
	Resource	Water	1	193	2	386	0.74	0.07	285.45	28.55
Shuttle-bus	Local	Chemical	1	193	4	771	0.19	0.02	149.91	14.95
	Resource	Water	1	193	2	386	0.87	0.09	335.15	33.52
Dump w/ bellydump	Local	Chemical	1	997	4	3986	0.19	0.02	774.90	77.30
	Resource	Water	1	997	2	1993	2.09	0.21	4,158.61	415.86
5-ton stake bed	Local	Chemical	1	7	4	29	0.19	0.02	5.62	0.56
	Resource	Water	1	7	2	14	0.87	0.09	12.57	1.26
Flatbed w/crane	Local	Chemical	1	5	4	20	0.19	0.02	3.89	0.39
	Resource	Water	1	5	2	10	1.53	0.15	15.27	1.53
Concrete Truck	Local	Chemical	1	10	4	39	0.19	0.02	7.50	0.75
	Resource	Water	1	10	2	19	1.66	0.17	31.96	3.20
Water Truck	Local	Chemical	1	193	4	771	0.19	0.02	149.91	14.95
	Resource	Water	1	771	2	1542	1.53	0.15	2,355.76	235.58
Rig Haul Trucks	Local	Chemical	1	40	4	160	0.19	0.02	31.10	3.10
	Resource	Water	1	40	2	80	2.22	0.22	177.25	17.72
									10,621.03	1,061.61
						Tons - Small (all):			5.31	0.531

¹ VMT = vehicles per site *round trip distance over all site prep areas

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Traffic – Dust – Paved

		Total truck trips calculated above						miles = 50-6 for unpaved	
	Vehicle Type	Vehicle Count	Vehicles/site	RT Distance	Vehicle Miles Traveled (VMT) ¹	PM ₁₀ Emissions (controlled)	PM _{2.5} Emissions (controlled)	PM ₁₀ Emissions (controlled)	PM _{2.5} Emissions (controlled)
		Not used	(RT/staging areas)	(miles)	(VMT/all staging areas)	(lb/VMT)	(lb/VMT)	(lb/all staging areas)	(lb/all staging areas)
Large Staging	Commuter Vehicle	1	273	44	12003	0.0015	0.0004	18.33	4.50
Small Staging		1	964	44	42416	0.0015	0.0004	64.78	15.90
Large Staging	Light Trucks - pick-up/tool	1	55	44	2401	0.0023	0.0006	5.49	1.35
Small Staging		1	193	44	8483	0.0023	0.0006	19.40	4.76
Large Staging	Shuttle-bus	1	55	44	2401	0.0035	0.0009	8.42	2.07
Small Staging		1	193	44	8483	0.0035	0.0009	29.76	7.31
Large Staging	Dump w/ bellydump	1	252	44	11093	0.0362	0.0089	402.07	98.69
Small Staging		1	997	44	43850	0.0362	0.0089	1,589.33	390.11
Large Staging	5-ton stake bed	1	2	44	90	0.0035	0.0009	0.32	0.08
Small Staging		1	7	44	318	0.0035	0.0009	1.12	0.27
Large Staging	Flatbed w/crane	1	1	44	44	0.0158	0.0039	0.69	0.17
Small Staging		1	5	44	220	0.0158	0.0039	3.47	0.85
Large Staging	Concrete Truck	1	3	44	120	0.0196	0.0048	2.36	0.58
Small Staging		1	10	44	424	0.0196	0.0048	8.33	2.04
Large Staging	Water Truck	1	55	44	2401	0.0158	0.0039	37.87	9.30
Small Staging		1	193	44	8483	0.0158	0.0039	133.83	32.85
Large Staging	Rig Haul Trucks	1	8	44	352	0.0425	0.0104	14.98	3.68
Small Staging		1	40	44	1760	0.0425	0.0104	74.88	18.38
							lbs - large:	490.53	120.40
							lbs - small:	1,924.90	472.48
							Tons - large area:	0.25	0.06
							Tons - small areas:	0.96	0.24

¹ VMT = vehicles per site *round trip distance over all site prep areas

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Tail Pipe Emissions – Transient vehicles

	Vehicle Type	Type	Vehicles/site	RT Distance	Vehicle Miles Traveled (VMT) ¹	CO	NO _x	SO ₂	VOC	PM ₁₀	CO	NO _x	SO ₂	VOC	PM ₁₀
			(RT/all staging areas)	(miles)	(VMT /all staging areas)										
						g/mile					lbs/grouped staging areas				
Large Staging	Commuter Vehicle	Gas Car/Truck	273	50	13640	4.89	0.72	0.006	0.10	0.01	146.80	21.70	0.17	3.11	0.42
Small Staging			964	50	48200	4.89	0.72	0.006	0.10	0.01	518.75	76.67	0.61	10.99	1.50
Large Staging	Light Trucks - pick-up/tool	Diesel	55	50	2728	1.45	2.53	0.005	0.26	0.16	8.70	15.20	0.03	1.58	0.93
Small Staging			193	50	9640	1.45	2.53	0.005	0.26	0.16	30.75	53.72	0.10	5.59	3.29
Large Staging	Shuttle-bus	Diesel	55	50	2728	1.72	7.36	0.009	0.35	0.35	10.31	44.20	0.05	2.09	2.08
Small Staging			193	50	9640	1.72	7.36	0.009	0.35	0.35	36.44	156.18	0.18	7.39	7.35
Large Staging	Dump w/ bellydump	Diesel - Combo	252	50	12606	1.74	9.01	0.015	0.28	0.38	48.20	250.23	0.41	7.87	10.50
Small Staging			997	50	49830	1.74	9.01	0.015	0.28	0.38	190.53	989.14	1.62	31.13	41.52
Large Staging	5-ton stake bed	Diesel	2	50	102	0.94	2.88	0.006	0.22	0.15	0.21	0.65	0.00	0.05	0.03
Small Staging			7	50	362	0.94	2.88	0.006	0.22	0.15	0.75	2.29	0.00	0.17	0.12
Large Staging	Flatbed w/crane	Diesel	1	50	50	0.94	2.88	0.006	0.22	0.15	0.10	0.32	0.00	0.02	0.02
Small Staging			5	50	250	0.94	2.88	0.006	0.22	0.15	0.52	1.58	0.00	0.12	0.08
Large Staging	Concrete Truck	Diesel	3	50	136	0.94	2.88	0.006	0.22	0.15	0.28	0.86	0.00	0.07	0.05
Small Staging			10	50	482	0.94	2.88	0.006	0.22	0.15	1.00	3.05	0.01	0.23	0.16
Large Staging	Water Truck	Diesel	55	50	2728	0.94	2.88	0.006	0.22	0.15	5.66	17.28	0.04	1.32	0.93
Small Staging			193	2	386	0.94	2.88	0.006	0.22	0.15	0.80	2.44	0.01	0.19	0.13
Large Staging	Rig Haul Trucks	Diesel - Combo	8	50	400	1.74	9.01	0.015	0.28	0.38	1.53	7.94	0.01	0.25	0.33
Small Staging			40	50	2000	1.74	9.01	0.015	0.28	0.38	7.65	39.70	0.06	1.25	1.67
			RT/all staging area	hours idle per each RT	hours			g/hr							

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Tail Pipe Emissions – Transient vehicles

	Vehicle Type	Type	Vehicles/site	RT Distance	Vehicle Miles Traveled (VMT) ¹	CO	NO _x	SO ₂	VOC	PM ₁₀	CO	NO _x	SO ₂	VOC	PM ₁₀
			(RT/all staging areas)	(miles)	(VMT /all staging areas)										
						g/mile					lbs/grouped staging areas				
Large Staging	Dump w/belly dump - idle hours ²	Diesel	252	0.25	63	0.09	5.87	5.97	2.93	3.37	0.01	0.81	0.83	0.41	0.47
Small Staging	Dump w/belly dump - idle hours ²	Diesel	997	0.25	249	0.09	5.87	5.97	2.93	3.37	0.05	3.22	3.28	1.61	1.85
						Tons Large staging areas:					0.11	0.18	0.0004	0.0082	0.0076
						Tons/small staging areas:					0.39	0.66	0.0013	0.0285	0.0279

¹ VMT = vehicles per site * round trip distance over all site prep areas

² Idle assumed 15 minutes/trip

8. Gravel Road and Trail Construction

Pad Construction – Dust On-site Emissions – Onsite Heavy Equipment – Dust

Area	Length	Width	Size	Number of Sites	Operation	TSP Emissions (Controlled)	PM ₁₀ Emissions (controlled)	TSP Emissions (Controlled)	PM ₁₀ Emissions (controlled)
	(miles)	(ft)	(acres)		(%)	T/acre ²	T/acre ²	T/acre ²	T/acre ²
LSDA - Road	4	30	14.55	1	100	0.02	0.01	4.84	1.74
SNDM - Pull Off			3.00	1	100	0.02	0.01	0.21	0.07
								Total:	5.05

Onsite Exhaust – Tail Pipe Emissions – Onsite Heavy Equipment

	Pollutant Emissions (T/hr)									
	CO	NO _x	SO ₂	VOC	PM ₁₀					
Total Heavy Equipment Tailpipe Emissions	0.010297	0.008359	0.000006	0.001175	0.000485					
						T/area				
Area	Size	Number of Sites	Operation	Hours/acre ¹	Hours	CO	NO _x	SO ₂	VOC	PM ₁₀
	(acres)		(%)							
LSDA - Road	14.55	1	100	40	581.8	5.99	4.86	0.0033	0.6837	0.2819
SNDM - Pull Off	3.00	5	100	40	600	6.18	5.02	0.0034	0.7051	0.2907
					Total:	12.17	9.88	0.0067	1.3888	0.5727

¹ Each Piece of equipment needs 10 hours /acre and there are 4 of them

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Traffic – Dust – Lower Sonoran Decision Area Road

Vehicle Type	Road Type	Dust Control Method	Vehicle Count	Vehicles/site	RT Distance	Vehicle Miles Traveled (VMT) ¹	PM ₁₀ Emissions (controlled)	PM _{2.5} Emissions (controlled)	PM ₁₀ Emissions (controlled)
			Not used	(RT/staging areas)	(miles)	(VMT/all staging areas)	(lb/VMT)	(lb/VMT)	(lb/all staging areas)
Commuter Vehicle	Local	Chemical	1	100	4	400	0.19	0.02	77.68
	Resource	Water	1	100	2	200	0.64	0.06	127.13
Light Trucks - pick-up/tool	Local	Chemical	1	20	4	80	0.19	0.02	15.54
	Resource	Water	1	20	2	40	0.74	0.07	29.58
Shuttle-bus	Local	Chemical	1	20	4	80	0.19	0.02	15.54
	Resource	Water	1	20	2	40	0.87	0.09	34.73
Dump w/ bellydump	Local	Chemical	1	480	4	1920	0.19	0.02	373.22
	Resource	Water	1	480	2	960	2.09	0.21	2,002.94
5-ton stake bed	Local	Chemical	1	2	4	9	0.19	0.02	1.70
	Resource	Water	1	2	2	4	0.87	0.09	3.79
Flatbed w/crane	Local	Chemical	1	1	4	4	0.19	0.02	0.78
	Resource	Water	1	1	2	2	1.53	0.15	3.05
Concrete Truck	Local	Chemical	1	3	4	12	0.19	0.02	2.26
	Resource	Water	1	3	2	6	1.66	0.17	9.65
Water Truck	Local	Chemical	1	20	4	80	0.19	0.02	15.54
	Resource	Water	1	80	2	160	1.53	0.15	244.13
Rig Haul Trucks	Local	Chemical	1	8	4	32	0.19	0.02	6.22
	Resource	Water	1	8	2	16	2.22	0.22	35.45
									2,998.91
								Tons/LSDA:	1.50

Assume the 4 miles of road construct are the local road mile and 1 each way for resource.

¹ VMT = vehicles per site * round trip distance over all site prep areas

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Traffic – Dust – Sonoran Desert National Monument Pulloffs

Vehicle Type	Road Type	Dust Control Method	Vehicle Count	Vehicles/site	RT Distance	Vehicle Miles Traveled (VMT) ¹	PM ₁₀ Emissions (controlled)	PM _{2.5} Emissions (controlled)	PM ₁₀ Emissions (controlled)
			Not used	(RT/staging areas)	(miles)	(VMT/all staging areas)	(lb/VMT)	(lb/VMT)	(lb/all staging areas)
Commuter Vehicle	Local	Chemical	1	21	4	82	0.19	0.02	16.02
	Resource	Water	1	21	2	41	0.64	0.06	26.22
Light Trucks – pick-up/tool	Local	Chemical	1	4	4	16	0.19	0.02	3.20
	Resource	Water	1	4	2	8	0.74	0.07	6.10
Shuttle-bus	Local	Chemical	1	4	4	16	0.19	0.02	3.20
	Resource	Water	1	4	2	8	0.87	0.09	7.16
Dump w/ bellydump	Local	Chemical	1	99	4	396	0.19	0.02	76.98
	Resource	Water	1	99	2	198	2.09	0.21	413.11
5-ton stake bed	Local	Chemical	1	0.5	4	2	0.19	0.02	0.35
	Resource	Water	1	0.5	2	1	0.87	0.09	0.78
Flatbed w/crane	Local	Chemical	1	1	4	4	0.19	0.02	0.78
	Resource	Water	1	1	2	2	1.53	0.15	3.05
Concrete Truck	Local	Chemical	1	1	4	2	0.19	0.02	0.47
	Resource	Water	1	1	2	1	1.66	0.17	1.99
Water Truck	Local	Chemical	1	4	4	16	0.19	0.02	3.20
	Resource	Water	1	16	2	33	1.53	0.15	50.35
Rig Haul Trucks	Local	Chemical	1	8	4	32	0.19	0.02	6.22
	Resource	Water	1	8	2	16	2.22	0.22	35.45
									654.64
								Tons/SDNM:	0.33

¹ VMT = vehicles per site * round trip distance over all site prep areas

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Traffic – Dust – Paved

	Vehicle Type	Vehicle Count	Vehicles/site	RT Distance	Vehicle Miles Traveled (VMT) ¹	PM ₁₀ Emissions (controlled)	PM _{2.5} Emissions (controlled)	PM ₁₀ Emissions (controlled)
		Not used	(RT/staging areas)	(miles)	(VMT/all staging areas)	(lb/VMT)	(lb/VMT)	(lb/area)
LSDA Road	Commuter Vehicle	1	100	44	4396	0.0015	0.0004	6.71
SDNM Pulloff		1	21	44	907	0.0015	0.0004	1.38
LSDA Road	Light Trucks – pick-up/tool	1	20	44	879	0.0023	0.0006	2.01
SDNM Pulloff		1	4	44	181	0.0023	0.0006	0.41
LSDA Road	Shuttle-bus	1	20	44	879	0.0035	0.0009	3.08
SDNM Pulloff		1	4	44	181	0.0035	0.0009	0.64
LSDA Road	Dump w/ bellydump	1	480	44	21120	0.0362	0.0089	765.48
SDNM Pulloff		1	99	44	4356	0.0362	0.0089	157.88
LSDA Road	5-ton stake bed	1	2	44	96	0.0035	0.0009	0.34
SDNM Pulloff		1	0.5	44	20	0.0035	0.0009	0.07
LSDA Road	Flatbed w/crane	1	1	44	44	0.0158	0.0039	0.69
SDNM Pulloff		1	1	44	44	0.0158	0.0039	0.69
LSDA Road	Concrete Truck	1	3	44	128	0.0196	0.0048	2.51
SDNM Pulloff		1	1	44	26	0.0196	0.0048	0.52
LSDA Road	Water Truck	1	20	44	879	0.0158	0.0039	13.87
SDNM Pulloff		1	4	44	181	0.0158	0.0039	2.86
LSDA Road	Rig Haul Trucks	1	8	44	352	0.0425	0.0104	14.98
SDNM Pulloff		1	8	44	352	0.0425	0.0104	14.98
							Lbs LSDA:	809.68
							Lbs SDNM:	179.43
							Tons LSDA:	0.40
							Tons SDNM:	0.09

¹ VMT = vehicles per site * round trip distance over all site prep areas

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Traffic – Exhaust - Tail Pipe Emissions - Transient vehicles

	Vehicle Type	Type	Vehicles/site	RT Distance	Vehicle Miles Traveled (VMT) ¹	CO	NO _x	SO ₂	VOC	PM ₁₀	CO	NO _x	SO ₂	VOC	PM ₁₀
			(RT/all staging areas)	(miles)	(VMT /all staging areas)										
						g/mile					lbs/area				
LSDA - (Rural Restricted)	Commuter Vehicle	Gas Car/Truck	100	50	4995	4.89	0.72	0.01	0.10	0.01	53.76	7.95	0.06	1.14	0.16
SDNM - (Rural Unrestricted)			21	50	1030	3.20	0.62	0.01	0.10	0.02	7.26	1.42	0.01	0.22	0.05
LSDA - (Rural Restricted)	Light Trucks - pick-up/tool	Diesel	20	50	999	1.45	2.53	0.00	0.26	0.16	3.19	5.57	0.01	0.58	0.34
SDNM - (Rural Unrestricted)			4	50	206	1.93	2.84	0.00	0.37	0.18	0.88	1.29	0.00	0.17	0.08
LSDA - (Rural Restricted)	Shuttle-bus	Diesel	20	50	999	1.72	7.36	0.01	0.35	0.35	3.78	16.19	0.02	0.77	0.76
SDNM - (Rural Unrestricted)			4	50	206	1.72	5.39	0.01	0.42	0.37	0.78	2.45	0.00	0.19	0.17
LSDA - (Rural Restricted)	Dump w/ bellydump	Diesel - Combo	480	50	24000	1.74	9.01	0.01	0.28	0.38	91.77	476.41	0.78	14.99	20.00
SDNM - (Rural Unrestricted)			99	50	4950	2.15	9.04	0.01	0.37	0.48	23.49	98.61	0.16	4.04	5.19
LSDA - (Rural Restricted)	5-ton stake bed	Diesel	2	50	109	0.94	2.88	0.01	0.22	0.15	0.23	0.69	0.00	0.05	0.04
SDNM - (Rural Unrestricted)			0	50	23	1.72	5.39	0.01	0.42	0.37	0.09	0.27	0.00	0.02	0.02
LSDA - (Rural Restricted)	Flatbed w/crane	Diesel	1	50	50	0.94	2.88	0.01	0.22	0.15	0.10	0.32	0.00	0.02	0.02
SDNM - (Rural Unrestricted)			1	50	50	1.72	5.39	0.01	0.42	0.37	0.19	0.59	0.00	0.05	0.04
LSDA - (Rural Restricted)	Concrete Truck	Diesel	3	50	145	0.94	2.88	0.01	0.22	0.15	0.30	0.92	0.00	0.07	0.05
SDNM - (Rural Unrestricted)			1	50	30	1.72	5.39	0.01	0.42	0.37	0.11	0.36	0.00	0.03	0.02

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Traffic – Exhaust - Tail Pipe Emissions - Transient vehicles

	Vehicle Type	Type	Vehicles/site	RT Distance	Vehicle Miles Traveled (VMT) ¹	CO	NO _x	SO ₂	VOC	PM ₁₀	CO	NO _x	SO ₂	VOC	PM ₁₀
			(RT/all staging areas)	(miles)	(VMT /all staging areas)										
						g/mile					lbs/area				
LSDA - (Rural Restricted)	Water Truck	Diesel	20	50	999	0.94	2.88	0.01	0.22	0.15	2.07	6.33	0.01	0.48	0.34
LSDA - (Rural Restricted)			80	2	160	0.94	2.88	0.01	0.22	0.15	0.33	1.01	0.00	0.08	0.05
SDNM - (Rural Unrestricted)	Water Truck	Diesel	4	50	206	1.72	5.39	0.01	0.42	0.37	0.78	2.45	0.00	0.19	0.17
SDNM - (Rural Unrestricted)			16	2	33	1.72	5.39	0.01	0.42	0.37	0.12	0.39	0.00	0.03	0.03
LSDA - (Rural Restricted)	Rig Haul Trucks	Diesel - Combo	8	50	400	1.74	9.01	0.01	0.28	0.38	1.53	7.94	0.01	0.25	0.33
SDNM - (Rural Unrestricted)			8	50	400	2.15	9.04	0.01	0.37	0.48	1.90	7.97	0.01	0.33	0.42
			RT/area	hours idle per each RT	hours	g/hr									
LSDA - (Rural Restricted)	Dump w/belly dump - IDLE hours ²	Diesel	480	0.25	120	0.09	5.87	5.97	2.93	3.37	0.02	1.55	1.58	0.78	0.89
SDNM - (Rural Unrestricted)	Dump w/belly dump - IDLE hours ²	Diesel	99	0.25	25	0.10	5.96	6.06	2.98	3.43	0.01	0.32	0.33	0.16	0.19
											0.08	0.26	0.0012	0.0096	0.0115
											0.02	0.06	0.0003	0.0027	0.0032
											0.10	0.32	0.0015	0.0123	0.0147

¹ VMT = vehicles per site *round trip distance over all site prep areas

² Idle 15 minutes/trip

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Traffic – Exhaust for LSDA Single Track Trails – 5 miles – Commuter Traffic Only

	Vehicle Type	Type	Vehicles/site ¹	RT Distance	Vehicle Miles Traveled (VMT)	CO	NO _x	SO ₂	VOC	PM ₁₀	CO	NO _x	SO ₂	VOC	PM ₁₀
			No. of round trips (RT)	(miles)	(VMT /all staging areas)										
						g/mile					lbs				
LSDA - Restricted	Commuter Vehicle	Gas Car/Truck	158	50	7920	4.89	0.72	0.006	0.10	0.01	85.24	12.60	0.10	1.81	0.25
LSDA - Restricted	Light Trucks - pick-up/tool	Diesel	26	50	1320	1.45	2.53	0.005	0.26	0.16	4.21	7.36	0.01	0.77	0.45
						Total Tons for trails					0.0447	0.0100	0.0001	0.0013	0.0003

¹ Computation for RT for commuter vehicles

	cars/day	Feet of trail constructed	Trail construction rate (hours/foot)	Shift duration factor (days/hour)	No. of days required	Total no. of vehicle round trips required
Cars	6	26,400	0.01	0.1	26.4	158.4
Light truck w/tools	1	26,401	0.01	0.1	26.401	26.401

Assumes: 6 workers per day; trail construction rate 100 feet/hour; shift duration 10 hours/day; 5280 ft/mi x 5 miles = 26,400 feet or trail constructed.

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9. Gravel and Hardening – Sonoran Desert National Monument

Pad/Road Construction – On-site Emissions – Onsite Heavy Equipment – Dust – Grader Only

Area	Road Length	Road	Size	Number of Sites	Operation	fraction for gravel or grading only ¹	TSP Emissions (Controlled)	PM ₁₀ Emissions (controlled)	TSP Emissions (Controlled)	PM ₁₀ Emissions (controlled)
	(miles)	(Feet)	(acres)		(%)		T/acre ²	T/acre ²	T/area	T/area
SDNM - staging gravel			1.50	2	100	0.25	0.07	0.02	0.08	0.03
SDNM - maintenance grading	12	30	43.64	1	100	0.25	0.02	0.01	10.90	3.92

¹ use 1/4 number of days for gravel only

Onsite Exhaust – Tail Pipe Emissions – Onsite Heavy Equipment – Grader only

Pollutant Emissions (T/hr)												
	CO	NO _x	SO ₂	VOC	PM ₁₀							
Grader Heavy Equipment Tailpipe Emissions	0.002808	0.002280	0.000002	0.000320	0.000132							
T/area												
Area	Road Length	Road	Size	Number of Sites	Operation	Hours/acre ¹	Hours	CO	NO _x	SO ₂	VOC	PM ₁₀
	(miles)	(Feet)	(acres)		(%)							
SDNM - staging gravel (grader)			1.50	2	100	10	30	0.08	0.068	0.000	0.010	0.004
SDNM - maintenance grading	12	30	43.64	1	100	10	436	1.23	0.995	0.001	0.140	0.058

¹ Each Piece of equipment needs 10 hours /acre and there is only one of them

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**Traffic – Dust – Vehicle/Travel Emissions Dust (for all site-prep staging areas) – Sonoran Desert National Monument –
Gravel Only**

Vehicle Type	Road Type	Dust Control Method	Vehicle Count	Vehicles/site	RT Distance	Vehicle Miles Traveled (VMT) ¹	PM ₁₀ Emissions (controlled)	PM ₁₀ Emissions (controlled)
			Not used	(RT/project)	(miles)	(VMT/projects)	(lb/VMT)	(lb/project)
Commuter Vehicle	Local	Chemical	1	15	4	60	0.19	11.66
	Resource	Water	1	15	2	30	0.64	19.09
Light Trucks - pick-up/tool	Local	Chemical	1	3	4	12	0.19	2.33
	Resource	Water	1	3	2	6	0.74	4.44
Shuttle-bus	Local	Chemical	1	3	4	12	0.19	2.33
	Resource	Water	1	3	2	6	0.87	5.21
Dump w/ bellydump	Local	Chemical	1	40	4	158	0.19	30.79
	Resource	Water	1	40	2	79	2.09	165.24
5-ton stake bed	Local	Chemical	1	0.5	4	2	0.19	0.35
	Resource	Water	1	0.5	2	1	0.87	0.78
Water Truck	Local	Chemical	1	3	4	12	0.19	2.33
	Resource	Water	1	40	2	79	1.53	120.96
Rig Haul Trucks	Local	Chemical	1	4	4	16	0.19	3.11
	Resource	Water	1	4	2	8	2.22	17.72
							Total (tons):	0.19

¹ VMT = vehicles per site *round trip distance over all site prep areas

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Sonoran Desert National Monument – Grading Maintenance Only

Vehicle Type	Road Type	Dust Control Method	Vehicle Count	Vehicles/site	RT Distance ¹	Vehicle Miles Traveled (VMT)	PM ₁₀ Emissions (controlled)	PM ₁₀ Emissions (controlled)
			Not used	(RT/project)	(miles)	(VMT/project)	(lb/VMT)	(lb/project)
Commuter Vehicle	Local	Chemical	1	75	0	0	0.19	0.00
	Resource	Water	1	75	12	899	0.64	572.07
Light Trucks - pick-up/tool	Local	Chemical	1	15	0	0	0.19	0.00
	Resource	Water	1	15	12	180	0.74	133.12
Shuttle-bus	Local	Chemical	1	15	0	0	0.19	0.00
	Resource	Water	1	15	12	180	0.87	156.29
5-ton stake bed	Local	Chemical	1	6.5	0	0	0.19	0.00
	Resource	Water	1	6.5	12	79	0.87	68.27
Water Truck	Local	Chemical	1	15	0	0	0.19	0.00
	Resource	Water	1	60	12	719	1.53	1,098.58
Rig Haul Trucks	Local	Chemical	1	2	0	0	0.19	0.00
	Resource	Water	1	2	12	24	2.22	53.17
								2,081.50
							Total (tons):	1.04

¹ Travel 1/2 way on 12 mile road and back = 12 miles

**Lower Sonoran and Sonoran Desert National Monument
Resource Management Plan and Environmental Impact Statement**

Traffic – Dust – Paved

	Vehicle Type	Vehicle Count	Vehicles/site	RT Distance	Vehicle Miles Traveled (VMT) ¹	PM ₁₀ Emissions (controlled)	PM ₁₀ Emissions (controlled)
		Not used	(RT/project)	(miles)	(VMT/project)	(lb/VMT)	(lb/project)
SDNM Gravel only (area)	Commuter Vehicle	1	15	44	660	0.0015	1.01
SDNM Grading only (road)		1	75	44	3297	0.0015	5.03
SDNM Gravel only (area)	Light Trucks - pick-up/tool	1	3	44	132	0.0023	0.30
SDNM Grading only (road)		1	15	44	659	0.0023	1.51
SDNM Gravel only (area)	Shuttle-bus	1	3	44	132	0.0035	0.46
SDNM Grading only (road)		1	15	44	659	0.0035	2.31
SDNM Gravel only (area)	Dump w/ bellydump	1	40	44	1742	0.0362	63.15
SDNM Grading only (road)		1	0	44	0	0.0362	0.00
SDNM Gravel only (area)	5-ton stake bed	1	0.5	44	20	0.0035	0.07
SDNM Grading only (road)		1	6.5	44	288	0.0035	1.01
SDNM Gravel only (area)	Water Truck	1	3	44	132	0.0158	2.08
SDNM Grading only (road)		1	15	44	659	0.0158	10.40
SDNM Gravel only (area)	Rig Haul Trucks	1	4	44	176	0.0425	7.49
SDNM Grading only (road)		1	2	44	88	0.0425	3.74
						SDNM Gravel only (area) Total tons:	0.04
						SDNM Grading only (road) Total tons:	0.0120

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Traffic – Exhaust – Tail Pipe Emissions – Transient vehicles

	Vehicle Type	Type	Vehicles/site	RT Distance	Vehicle Miles Traveled (VMT) ¹	CO	NO _x	SO ₂	VOC	PM ₁₀	CO	NO _x	SO ₂	VOC	PM ₁₀
			(RT/project)	(miles)	(VMT /project)										
						g/mile					lbs/project				
SDNM Gravel only (area)	Commuter Vehicle	Gas Car/Truck	15	50	750	3.20	0.62	0.01	0.10	0.02	5.28	1.03	0.01	0.16	0.03
SDNM Grading only (road)				75	50	3746	3.20	0.62	0.01	0.10	0.02	26.40	5.15	0.05	0.79
SDNM Gravel only (area)	Light Trucks - pick-up/tool	Diesel	3	50	150	1.93	2.84	0.00	0.37	0.18	0.64	0.94	0.00	0.12	0.06
SDNM Grading only (road)				15	50	749	1.93	2.84	0.00	0.37	0.18	3.18	4.70	0.01	0.61
SDNM Gravel only (area)	Shuttle-bus	Diesel	3	50	150	1.72	5.39	0.01	0.42	0.37	0.57	1.78	0.00	0.14	0.12
SDNM Grading only (road)				15	50	749	1.72	5.39	0.01	0.42	0.37	2.83	8.90	0.01	0.69
SDNM Gravel only (area)	Dump w/ bellydump	Diesel - Combo	40	50	1980	2.15	9.04	0.01	0.37	0.48	9.40	39.44	0.06	1.62	2.08
SDNM Grading only (road)				0	0	0	2.15	9.04	0.01	0.37	0.48	0.00	0.00	0.00	0.00
SDNM Gravel only (area)	5-ton stake bed	Diesel	0.5	50	23	1.72	5.39	0.01	0.42	0.37	0.09	0.27	0.00	0.02	0.02
SDNM Grading only (road)				6.5	50	327	1.72	5.39	0.01	0.42	0.37	1.24	3.89	0.00	0.30
SDNM Gravel only (area)	Water Truck	Diesel	3	50	150	1.72	5.39	0.01	0.42	0.37	0.57	1.78	0.00	0.14	0.12
SDNM Gravel only (area)				40	2	79	1.72	5.39	0.01	0.42	0.37	0.30	0.94	0.00	0.07
SDNM Grading only (road)	Water Truck	Diesel	15	50	749	1.72	5.39	0.01	0.42	0.37	2.83	8.90	0.01	0.69	0.60
SDNM Grading only (road)				60	2	120	1.72	5.39	0.01	0.42	0.37	0.45	1.42	0.00	0.11
SDNM Gravel only (area)	Rig Haul Trucks	Diesel - Combo	4	50	200	2.15	9.04	0.01	0.37	0.48	0.95	3.98	0.01	0.16	0.21
SDNM Grading only (road)				2	50	100	2.15	9.04	0.01	0.37	0.48	0.47	1.99	0.00	0.08
			RT/area	hours idle per each RT	hours			g/hr							

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Traffic – Exhaust – Tail Pipe Emissions – Transient vehicles

	Vehicle Type	Type	Vehicles/site	RT Distance	Vehicle Miles Traveled (VMT) ¹	CO	NO _x	SO ₂	VOC	PM ₁₀	CO	NO _x	SO ₂	VOC	PM ₁₀	
			(RT/project)	(miles)	(VMT /project)											
						g/mile					lbs/project					
SDNM Gravel only (road)	Dump w/belly dump - idle hours ²	Diesel	40	0.25	10	0.10	5.96	6.06	2.98	3.43	.0021	0.13	0.13	0.07	0.07	
							SDNM Gravel only (area) Total tons:					0.00889	0.02515	0.00011	0.00125	0.00139
							SDNM Grading only (road) Total tons:					0.01863	0.01724	0.00004	0.00162	0.00106

¹ VMT = vehicles per site * round trip distance

² Idle assumed 15 minutes/trip

**Lower Sonoran and Sonoran Desert National Monument
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10. Usage – Lower Sonoran Decision Area

Traffic – Recreational Dust – Lower Sonoran Decision Area – Current

Season	Vehicle Type	Road Type	Dust Control Method	Miles/day	No Days	Vehicle Miles Traveled (VMT)	Factor for winter/Summer (precip)	PM ₁₀ Emission Factor (controlled)	PM ₁₀ Emissions (controlled)
								(lb/VMT)	(lb/VMT)
Summer	Primary Unpaved	Local	Chemical/water	12.0	184	0	0.91	0.66	0.00
Winter				108.0	181	0	0.89	0.66	0.00
Summer	Secondary Unpaved	Local	none	0.5	184	0	0.91	0.96	0.00
Winter				4.9	181	0	0.89	0.96	0.00
Summer	Jeep Road	Local	none	2.4	184	446.85714	0.91	0.66	266.42
Winter				21.9	181	3956.1429	0.89	0.66	2,311.67
Summer	ATV Road	Local	none	4.0	184	736	0.91	0.62	413.70
Winter				36.0	181	6516	0.89	0.62	3,589.55
Summer	Motorcycle Trail	Local	none	3.7	184	683.42857	0.91	0.69	429.53
Winter				33	181	6050.5714	0.89	0.69	3,726.88
								Total Unpaved Road Traffic Emissions (tons):	3.51

Traffic – Dust – Lower Sonoran Decision Area Road (Commuter)

Vehicle Type	Road Type	Dust Control Method	Vehicle Count	RT Distance	Vehicle Miles Traveled (VMT) ¹	Precip factor	PM ₁₀ Emissions (controlled)	PM ₁₀ Emissions (controlled)
				(miles)	(VMT/LSDA)		(lb/VMT)	(lb/LSDA)
Commuter Vehicle	Local ¹	Chemical/water	30000	1.82	54600	0.90	0.66	32,577.30
	Resource ¹	none	30000	0.08	2400	0.90	0.96	2,306.27
							Total tons:	17.44

¹ used same split for primary and secondary as above (0.5/12.5)=-.04

0.04*2=0.08

**Lower Sonoran and Sonoran Desert National Monument
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Usage – Traffic Paved

Vehicle Type	No sites	Number Vehicles/year	RT Distance ¹	Vehicle Miles Traveled (VMT) ¹	PM ₁₀ Emissions (controlled)	PM ₁₀ Emissions (controlled)
			(miles)	(VMT/LSDA)	(lb/VMT)	(lb)
Commuter Vehicle	1	30000	48	1440000	0.002	2,199.13
					Total tons:	1.10

¹ 50-2 miles

Assume all are average vehicle (2wd, 4wd, even though some may be motorcycles)

Traffic – Exhaust – Tail Pipe Emissions – Transient vehicles

	Type	Vehicles/site	RT Distance	Vehicle Miles Traveled (VMT)	CO	NO _x	SO ₂	VOC	PM ₁₀	CO	NO _x	SO ₂	VOC	PM ₁₀
			(miles)	(VMT /LSDA)										
Pavement transport (restricted)	car/truck	30000	50	1500000	g/mile					lbs/LSDA				
					4.89	0.72	0.01	0.10	0.01	16143.59	2386.14	18.84	341.98	46.67
							total tons exhaust onroad:			8.07	1.19	0.009	0.171	0.023
					Use unrestricted here									
Trail Exhaust														
Primary Unpaved (car)	onroad			0	1.98	0.35	0.00	0.05	0.02	0.00	0.00	0.00	0.00	0.00
Secondary Unpaved (truck)	onroad			0	4.42	0.90	0.01	0.14	0.02	0.00	0.00	0.00	0.00	0.00
Jeep Road	onroad truck			4403	4.42	0.90	0.01	0.14	0.02	42.84	8.75	0.06	1.39	0.24
ATV Road	ATV			7252	47.81	0.25	0.03	48.72	1.86	763.71	4.00	0.45	778.19	29.75
Motorcycle Trail	ATV			6734	47.81	0.25	0.03	48.72	1.86	709.16	3.71	0.41	722.60	27.62
							total lbs			1515.71	16.46	0.92	1502.18	57.61
					Total tons exhaust offroad:					0.76	0.0082	0.0005	0.7511	0.0288

II. Usage – Sonoran Desert National Monument

Estimate of On-road Vehicles and OHVs per Year per Site

Total On-road Vehicle Usage (Existing + Alt. E)	Usage %	No. of Vehicles	No. of Months	No. of Use Days	Total Vehicle Days
Every weekend for 6 mo	75%	56.3	6	52.1	2,933.0
Every weekend for 1 mo	100%	75.0	1	8.7	651.8
Weekdays for months above	0%	0.0	7	152.1	0.0
Remaining 5 mo	0%	0.0	5	152.1	0.0
Total annual usage				365.0	3,584.8
Avg. veh/day over entire year					9.8
Impact of Alt. E per site as well as current					
On-road Vehicles					
Total annual usage					1,792.4
Avg. annual veh/day					4.9
OHVs					
Total annual usage					179.2
Avg. annual veh/day					0.49

Recreational Use Dust

Vehicle Type	Road Type	Dust Control Method	Miles/day	No Days	No Vehicles	Vehicle Miles Traveled (VMT)	Precip Factor for annual	PM ₁₀ Emission Factor (controlled) (lb/VMT)	PM ₁₀ Emissions (controlled) (lb/VMT)
Primary Unpaved	Local	Chemical/water	2.0	365	0.0	0	0.90	0.66	0.00
Secondary Unpaved	Resource	None	10.0	365	0	0	0.90	0.96	0.00
Jeep Road	Resource	None	10.0	365	0	0	0.90	0.66	0.00
ATV Road	Resource	None	20.0	365	0.49	3584.8214	0.90	0.62	2,001.16
Motorcycle Trail	Resource	None	20.0	365	0	0	0.90	0.69	0.00
Total Unpaved Road Traffic Emissions :									1.00

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Sonoran Desert National Monument Road (Commuter)

Vehicle Type	Road Type	Dust Control Method	Vehicle Count	RT Distance (miles)	Vehicle Miles Traveled (VMT) (VMT/SDNM)	Precip Factor for annual	PM ₁₀ Emissions (controlled) (lb/VMT)	PM ₁₀ Emissions (controlled) (lb/SDNM)		
Commuter Vehicle	Local	Chemical/Water	1,792.4	2	3585	0.90	0.66	2,145.42	1b	
	Resource	None	1,792.4	0	0	0.90	0.96	0.00	1b	
								Tons:	1.07	

Usage – Traffic Paved

Vehicle Type	no sites	Number Vehicles/year	RT Distance ¹ (miles)	Vehicle Miles Traveled (VMT) (VMT/SDNM)	Precip factor	PM ₁₀ Emissions (controlled) (lb/VMT)	PM ₁₀ Emissions (controlled) (lb)
Commuter Vehicle	1	1792	48	86036	0.90	0.0015	131.39
						Tons:	0.07

Assume all are average vehicle (2wd, 4wd, even though some may be motorcycles)

¹ 50-2 miles

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Traffic - Exhaust – Tail Pipe Emissions – Transient vehicles

	Vehicle Type	Type	Vehicles/site	RT Distance (miles)	Vehicle Miles Traveled (VMT) (VMT /SDNM)	CO	NO _x	SO ₂	VOC	PM ₁₀	CO	NO _x	SO ₂	VOC	PM ₁₀
Pavement transport						g/mile					lbs/SDNM				
(unrestricted)	Commuter	car/truck	1792	50	89621	3.20	0.62	0.01	0.10	0.02	631.51	123.29	1.09	18.81	4.11
Total tons onroad:											0.32	0.06	0.0005449	0.0094072	0.0020530
Use unrestricted below:															
Trail Exhaust															
Primary Unpaved (car)	onroad				0.0	1.98	0.35	0.005	0.05	0.02	0.00	0.0000000	0.0000000	0.0000000	0.0000000
Secondary Unpaved (truck)	onroad				0	4.42	0.90	0.006	0.14	0.02	0.00	0.00	0.00	0.00	0.00
Jeep Road	onroad truck				0	4.42	0.90	0.006	0.14	0.02	0.00	0.00	0.00	0.00	0.00
ATV Road	ATV				0.49	47.81	0.25	0.028	48.72	1.86	0.05	0.0002709	0.0000302	0.0526951	0.0020145
Motorcycle Trail	ATV				0	47.81	0.25	0.028	48.72	1.86	0.00	0.00	0.00	0.00	0.00
Total lbs											0.05	0.0002709	0.0000302	0.0526951	0.0020145
Total Tons offroad:											0.0000259	0.0000001	0.0000000	0.0000263	0.0000010
Tons:											0.3157798	0.0616438	0.0005449	0.0094336	0.0020540

12. Off-highway Vehicle Races

OHV Races

Types Participants	No. vehicles	Distance per race (mi)	Commuter distance (mi)
Trucks	100	200	--
Motorcycles	100	100	--
Support	100	--	--
Spectators	500	--	--
Total Traffic for Events:	800		50

Recreational Use Dust + Commuter

	Vehicle Type	Road Type	Dust Control Method ¹	Miles/day ¹	No Vehicles/day	Vehicle Miles Traveled (VMT)	Precip factor	PM ₁₀ Emission Factor (controlled) (lb/VMT)	PM ₁₀ Emissions (controlled) (lb/VMT)
Commuter	Secondary Unpaved	Local	Water	2.0	800.0	1600	0.90	0.96	1,381.66
Truck racers	Jeep Road	Resource	none	200.0	100	20000	0.90	0.66	11,806.42
Motorcycle racers	Motorcycle Trail	Resource	none	100.0	100	10000	0.90	0.69	6,222.76
Total Unpaved Road Traffic Emissions (Tons):									9.71

¹ Assume each vehicle ends up traveling a total of 2 mile on dirt roads, whether in parking areas or on access roads

**Lower Sonoran and Sonoran Desert National Monument
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Usage – Traffic Paved

Vehicle Type	No. sites	Number Vehicles/year	RT Distance (miles)	Vehicle Miles Traveled (VMT) (VMT/SDNM)	Precip factor	PM ₁₀ Emissions (controlled) (lb/VMT)	PM ₁₀ Emissions (controlled) (lb)
Commuter Vehicle	1	800	50	40000	0.90	0.002	54.89
Tons:							0.03

Assume all are average vehicle (2wd, 4wd, even though some may be motorcycles)

Traffic – Exhaust – Tail Pipe Emissions –Transient vehicles

	Vehicle Type	Type	Vehicles/site	RT Distance (miles)	Vehicle Miles Traveled (VMT) (VMT /Event)	CO	NO _x	SO ₂	VOC	PM ₁₀	CO	NO _x	SO ₂	VOC	PM ₁₀
						g/mile					lbs				
LSDA - (restricted)	Commuter	car/truck	800	50	40000	4.89	0.72	0.01	0.10	0.01	430.50	63.63	0.50	9.12	1.24
Total tons onroad:											0.22	0.03	0.0003	0.0046	0.0006
Race Exhaust						Use unrestricted below:									
Truck	Onroad truck		100	200	20000	4.42	0.90	0.01	0.14	0.02	194.60	39.74	0.28	6.31	1.09
Motorcycle/ATV	ATV		100	100	10000	47.81	0.25	0.03	48.72	1.86	1053.10	5.52	0.62	1073.06	41.02
Total lbs											1247.70	45.25	0.90	1079.37	42.11
Total Tons offroad:											0.62	0.0226	0.0004	0.5397	0.0211
Tons:											0.84	0.0544	0.0007	0.5442	0.0217