

Chapter 2. Alternatives, Including the Proposed Action

Oil-Gas Leasing

Introduction

This chapter describes and compares the alternatives considered for oil and gas leasing in the San Juan Basin within the Santa Fe National Forest. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice by the decision maker. Some of the information used to compare the alternatives is based upon the design of the alternative (i.e., leasing under standard terms and conditions versus leasing with additional constraints) and some of the information is based upon the environmental, social, and economic effects of implementing each alternative (i.e., the amount of local economic contributions that may be affected by leasing versus no leasing).

Alternatives Considered in Detail

The Forest Service developed the No Action and Proposed Action alternatives, and one additional alternative in response to issues raised by the public during scoping. Some definitions that are key to understanding the alternatives are listed below:

- **Application for Permit to Drill (APD):** a written request, petition, or offer to lease lands for the purpose of fluid minerals exploration and/or right-of-extraction.
- **Condition of Approval (COA):** a site-specific and enforceable requirement included in an approved Application for Permit to Drill (APD) or Sundry Notice that may limit or amend the specific actions proposed by the operator. Conditions of approval minimize, mitigate, or prevent impacts to resource values or other uses of public lands.
- **Controlled Surface Use (CSU):** a stipulation under which use and occupancy is allowed (unless restricted by another stipulation), but identified resource values require special operational limitations that may modify lease rights.
- **Exception:** a one-time exemption for a particular site within the leasehold; exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold. An exception is a limited type of waiver.
- **Expression of Interest (EOI):** an informal nomination to request that certain lands be included in an oil and gas competitive lease sale.
- **Lease Notice:** provides more detailed information concerning limitations that already exist in law, lease terms, regulations, and operational orders. A lease notice also addresses special items the lessee would consider when planning operations, but does not impose new or additional restrictions.
- **Lease Stipulation:** A modification of the standard lease terms and conditions at the time of the lease sale to provide a level of protection for other resource values or land uses by restricting lease operations during certain times or at certain locations, or to avoid unacceptable impacts, to an extent greater than standard lease terms or regulations. A stipulation is an enforceable term of the lease contract, supersedes any inconsistent provisions of the standard lease form, and is attached to and made a part of the lease. Lease stipulations further implement the Bureau of Land Management's (BLM) regulatory

- authority to protect resources or resource values. Lease stipulations are developed through the land use planning process.
- **Limited Surface Occupancy (Use):** a current forest plan stipulation added to a standard mineral lease specifying limitations on specific areas.
 - **Modification:** a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.
 - **No Surface Occupancy (NSO):** a stipulation that prohibits occupancy or disturbance on all or part of the lease surface to protect special values or uses. Lessees may exploit the fluid mineral resources under the leases restricted by this constraint through use of directional drilling from sites outside the NSO area.
 - **Notice to Lessees (NTL):** a written notice issued by the BLM to implement regulations and operating orders, and serve as instructions on a specific item(s) of importance within a state, district, or area.
 - **Standard Lease Terms and Conditions:** areas may be open to leasing with no specific management decisions defined in a forest land and resource management plan; however, these areas are subject to lease terms and conditions as defined on the BLM lease form (Form 3100-11, Offer to Lease and Lease for Oil and Gas).
 - **Standard Stipulation:** a current forest plan constraint added to all mineral, oil, and gas leases to protect resources from unnecessary disturbance. Fire, erosion control, payment for damages, cattleguards, pollution, camp construction, plan of operation, environmental analysis, protection of threatened and endangered species, and cultural resources are covered.
 - **Sundry Notice:** a standard form to notify or propose change of approved well operations subsequent to an application for permit to drill in accordance with 43 CFR 3162.3-2.
 - **Timing Limitation (TL) (Seasonal Restriction):** a stipulation that prohibits surface use during specified time periods to protect identified resource values. The constraint does not apply to the operation and maintenance of production facilities unless analysis demonstrates that such constraints are needed and that less stringent, project-specific constraints would be insufficient.
 - **Waiver:** a permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold.

Stipulations on new leases presented under each alternative would apply to any currently unleased parcels including the current expressions of interest.

Alternative 1

No Action

Under the No Action Alternative, standard lease terms and conditions or limited surface use, as identified in the current Forest Plan, would continue to guide management of oil-gas leasing in the study area. No additional constraints on oil-gas leasing would be implemented to protect surface resources. Conditions of approval (COA) or mitigation measures, which are developed and applied during second level NEPA site-specific analysis for applications for permit to drill

(APD), would continue to apply. Examples of standard terms and conditions and COAs typically used are included in appendix A.

Table OG-2 summarizes the oil-gas leasing categories listed in the current Forest Plan for each management area occurring within the oil-gas study area. Figure OG-8 displays the location of these oil-gas leasing categories under the No Action Alternative, with the exception of Management Area I that contains the locations of confidential archeological sites.

Table OG-2. Forest Plan oil-gas leasing category by management area

Mgt. Area	Management Emphasis	Oil-Gas Leasing Category	Forest Plan Page No.	Acres FS Land within Study Area
A	Timber production and enhancement of wildlife habitat diversity	Standard	100	41,836
B	Wildlife habitat improvement and key species habitat protection	Standard	104	8,855
C	Visual quality and developed recreation opportunities while protecting essential wildlife habitat and riparian zones	Limited Surface Use	110	<1
D	Enhancement of visual quality and developed recreation opportunity	Limited Surface Use	115	5,929
E	Provide dispersed recreation opportunities, maintaining visual quality, and timber and firewood production	Standard	119	22,706
G	Key wildlife habitat protection, habitat improvement, and forage and firewood production	Standard	123	9,554
I	Active management of cultural resources including protection, stabilization, interpretation, evaluation, and opportunities for research	Limited Surface Use	137	6
L	Provide semiprimitive, nonmotorized recreation opportunities	Limited Surface Use	148	10,570
P	Cultural resource location, inventory, nomination, and protection; timber production and enhancement of wildlife habitat diversity	Standard	160	3,485
R	Cultural resource location, inventory, nomination, and protection; wildlife habitat improvement and essential habitat protection and enhancement	Standard	168	74,600
S	Cultural resource site location, inventory nomination, and protection; key wildlife habitat protection, habitat improvement, and forage; firewood production	Standard	172	19,241

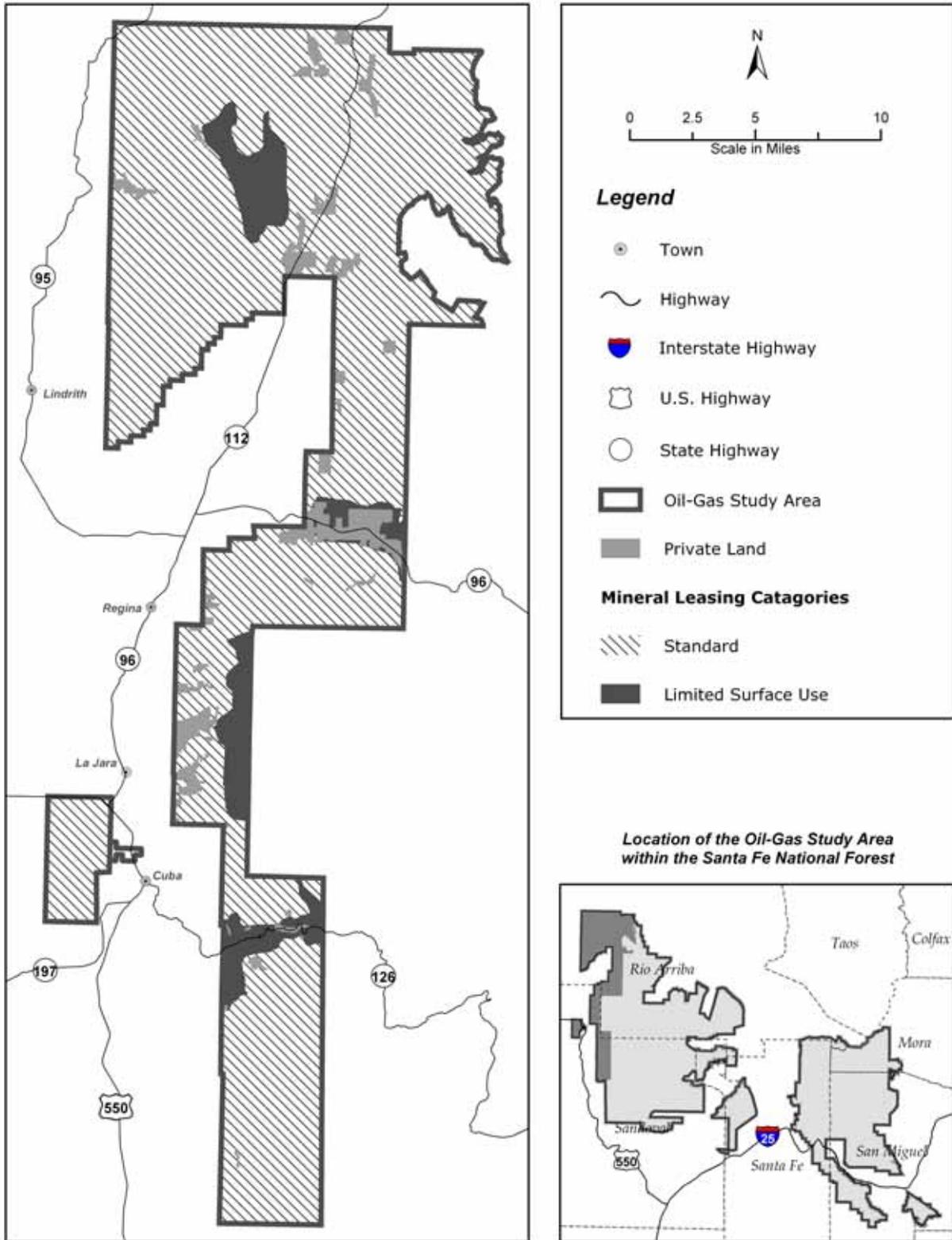


Figure OG-8. Oil-gas leasing categories under the No Action Alternative within the study area

Alternative 2

Proposed Action (Preferred Alternative)

The Proposed Action Alternative would update oil and gas leasing availability in the Forest Plan only within the defined study area (shown on Figures OG-6 and OG-7). Oil-gas leasing in the remainder of the Santa Fe National Forest would continue to be governed by the current Forest Plan leasing direction within each management area. The Proposed Action would add specific stipulations of no surface occupancy (NSO), controlled surface use (CSU), or timing limitation (TL) where needed to protect surface resources. Timing limitations refer to prohibiting drilling operations within the specified dates annually. Drilling operations include starting or finishing an existing drilling operation, completions, swabbing, tubing changes, pump changes, replacing compressors, replacing production equipment, and construction and maintenance with heavy equipment. Normal recurring production and day-to-day operations on existing wells, including trucking and removal of produced water, would be permitted under timing limitations.

The proposed stipulations listed below describe specific limitations regarding surface occupancy or use, their purpose, and the location and/or conditions under which they apply. The Proposed Action would only apply to new leases, not existing leases. New leases are defined as parcels within the study area that are currently unleased, as well as any existing leases that expire or are relinquished and become available for leasing in the future. All areas not within the boundaries of any proposed lease stipulations would remain open to oil-gas leasing under standard terms and conditions.

For the proposed lease stipulations, any changes made through exceptions or modifications would be made in accordance with the Forest Plan and all regulatory provisions applicable to such changes. If circumstances or relative resource values change, or if it can be demonstrated that oil and gas operations can be conducted without causing unacceptable impacts, the stipulation may be waived, excepted, or modified. An authorized Forest Service official may approve waivers, exceptions, or modifications if such action is consistent with the Forest Plan. If the action is not consistent, a Forest Plan amendment would be needed and developed with an associated NEPA analysis document. If the forest supervisor determines that the waiver, exception, or modification involves an issue of major public concern, the waiver, exception, or modification would be subject to a 30- to 90-day public review period (36 CFR §219.8).

The Proposed Action does not include any conditions or approval (COA) or mitigation measures, which are developed and applied during second level NEPA site-specific analysis of the APD surface use plan of operations. At that time, the Forest Service would ensure that applicable COAs are consistent with established BLM and Forest Service policies in the San Juan Basin for managing noise and air quality.

The proposed stipulations are identified by the resource they would protect, such as designated wildlife habitat, scenic areas, roadless recreation areas, and heritage resources. The proposed stipulations are described below, grouped by the type of stipulation, and displayed following the descriptions in Figures OG-9 through OG-12, which show NSO areas (Figure OG-9), TL areas (Figure OG-10), CSU areas (Figure OG-11), and all lease stipulations combined (Figure OG-12). Where lease stipulations overlap, the most stringent or the combination would apply. For example, where an area designated as CSU overlaps an area designated as NSO, the overlapping area would be managed as NSO. Where either CSU or NSO areas overlap areas designated for TL, the TL lease stipulation would apply in addition to either CSU or NSO.

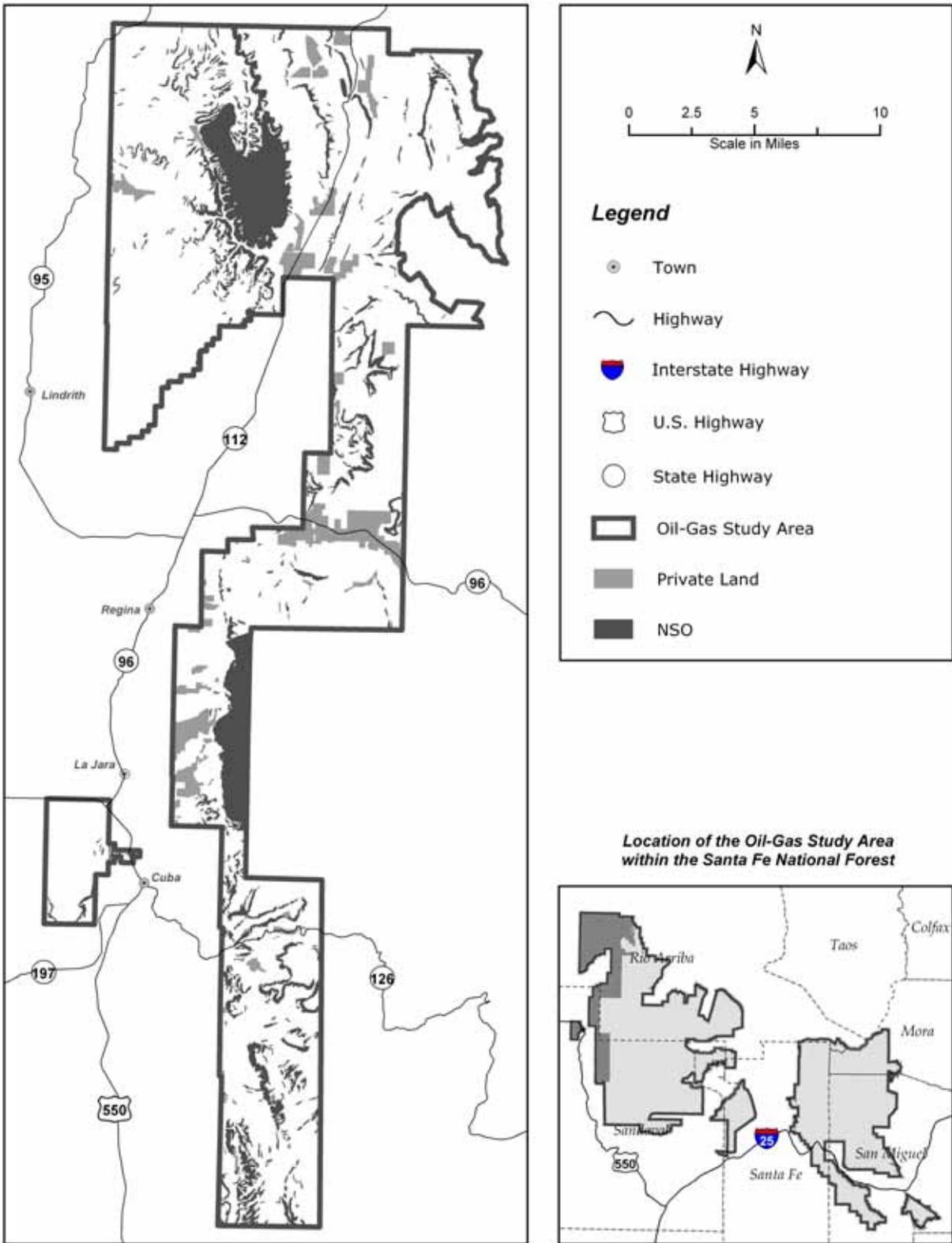


Figure OG-9. Proposed Action: No surface occupancy lease stipulations within the study area

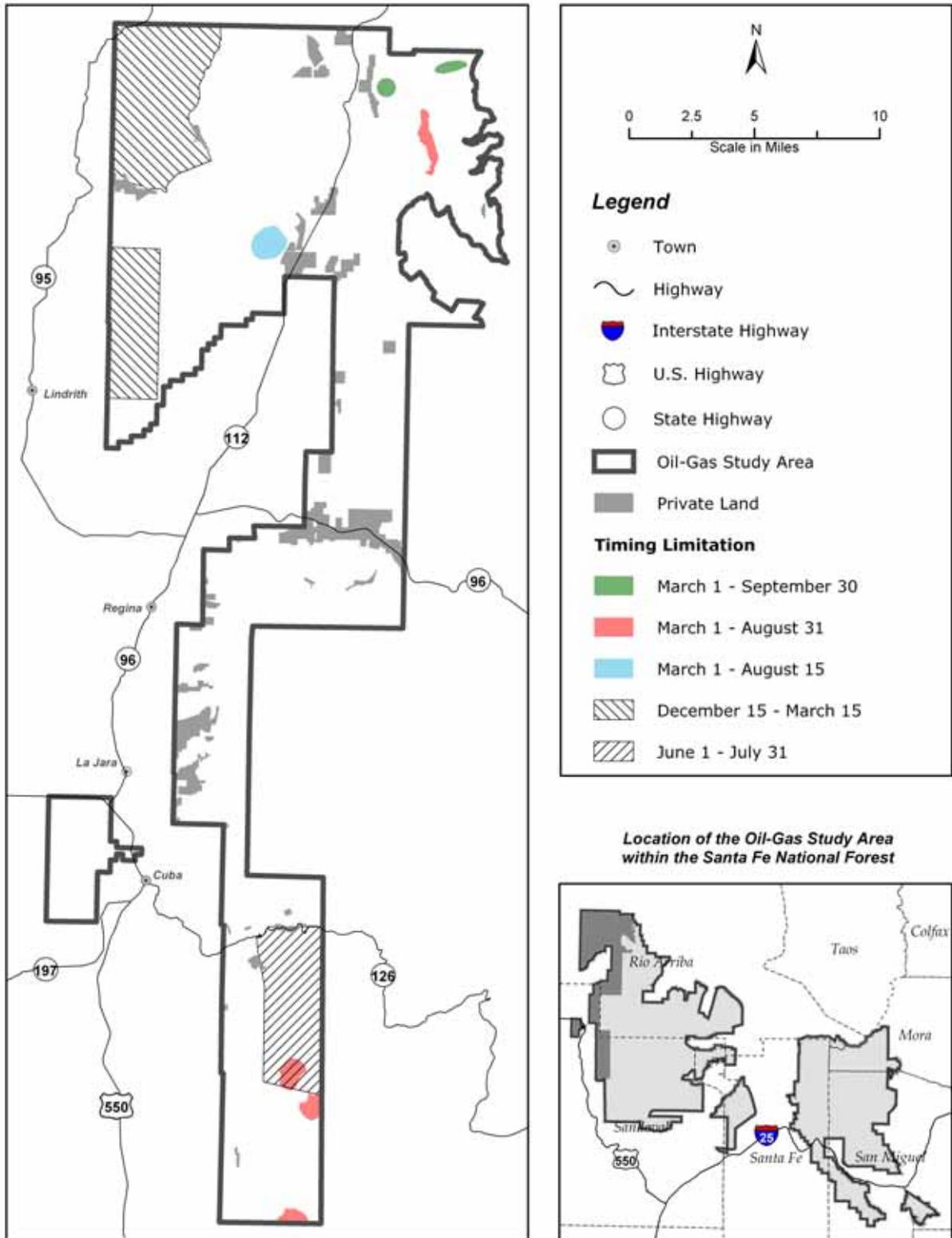


Figure OG-10. Proposed Action: Timing limitation lease stipulations within the study area

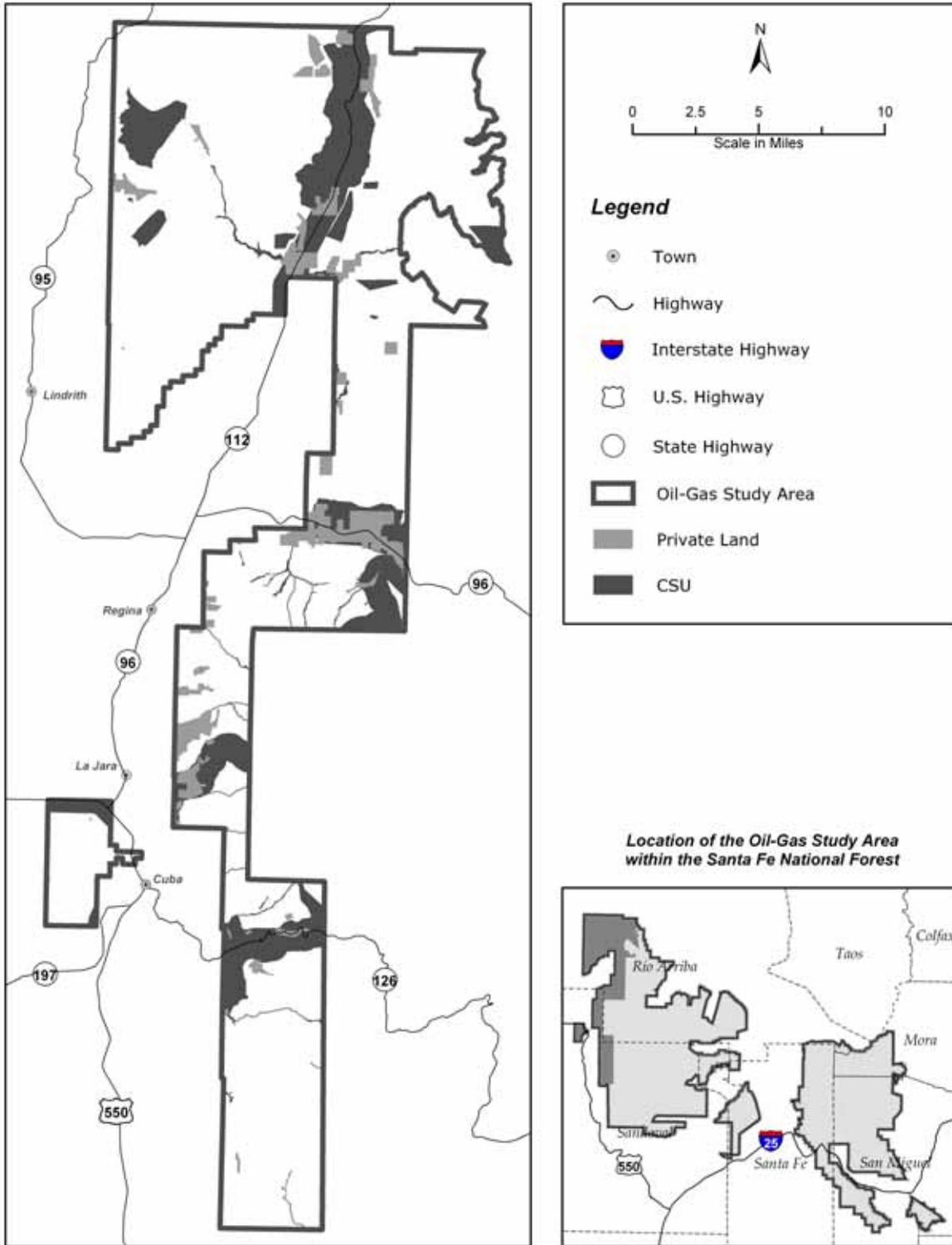


Figure OG-11. Proposed Action: Controlled surface use lease stipulations within the study area

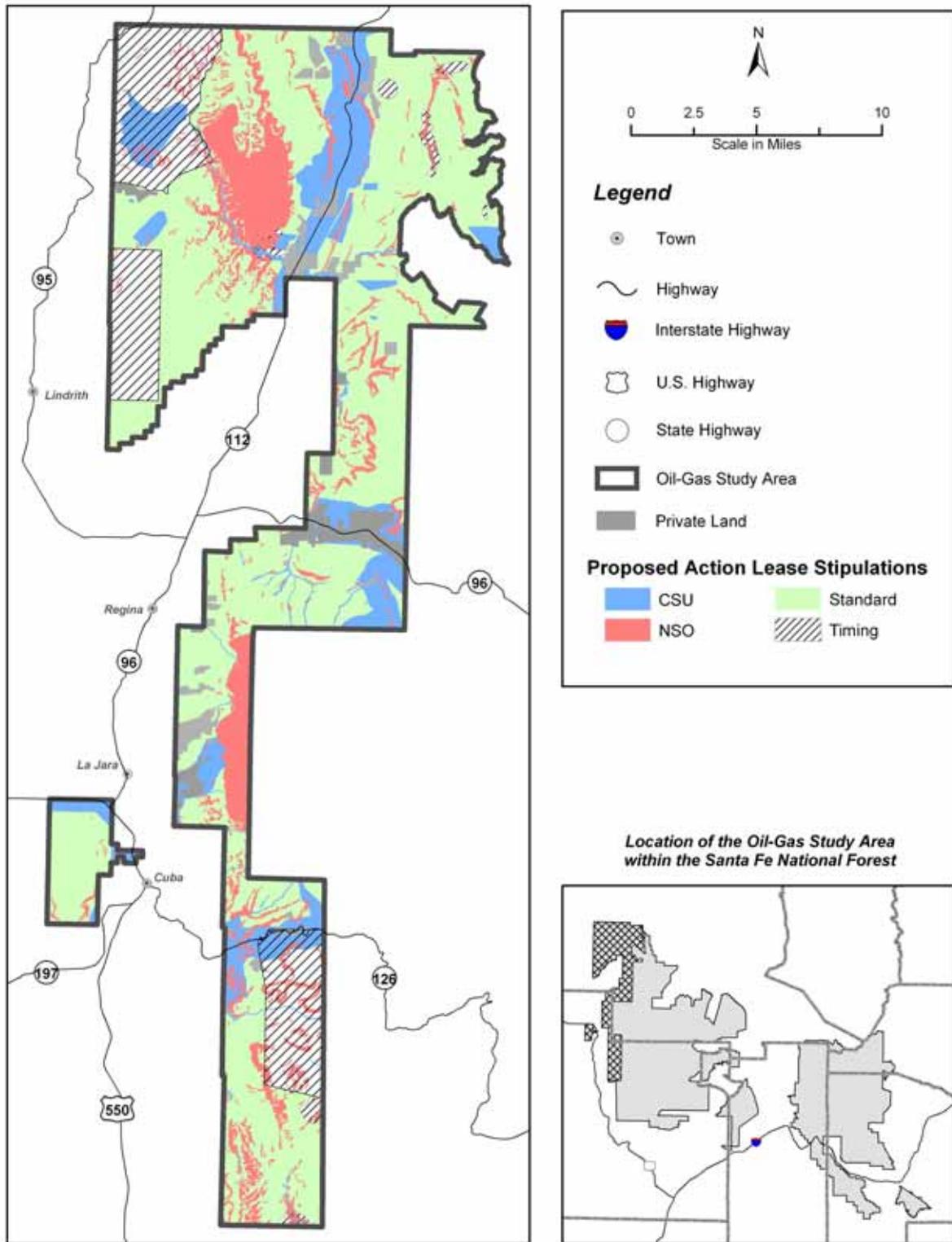


Figure OG-12. Proposed Action: All lease stipulations within the study area

Resource: Steep Slopes

- Stipulation:** No Surface Occupancy
- Location:** Generally narrow areas consisting of slopes of 40 percent or greater that have a higher erosion and mass wasting potential. These scattered areas range in size from 3 to over 2,000 acres each and may overlap other proposed NSO or CSU¹ areas.
- Purpose:** To preclude surface-disturbing activities on steep slopes (40 percent or more) because these slopes on the forest tend to have high erosion and mass wasting hazard. Without this protection there would be a high risk of impairing long-term soil productivity and watershed conditions.
- Exception:** An exception, modification or waiver may be granted if onsite inspection shows that unstable or steep slopes do not exist on the specific site, or if the operator can demonstrate in a surface use plan of operations that adverse effects can be minimized and activities safely conducted without loss of long-term site productivity. A public notice and comment period is required prior to waiver, exception, or modification of this stipulation.

Resource: Roadless Recreation, Management Area L

- Stipulation:** No Surface Occupancy
- Location:** Management Area L: Currently there are two areas totaling 10,570 acres. One narrow area lies directly adjacent to the west side of San Pedro Parks Wilderness, and the other lies about 6 miles west of Rio Chama Canyon Wilderness. Both areas consist primarily of steep, rugged terrain. Would apply wherever this management area is designated.
- Purpose:** To keep surface disturbance activities outside the designated roadless recreation area is needed to protect and maintain the roadless, semiprimitive, and nonmotorized character within these special areas, which include such elements as natural integrity, natural appearance, opportunity for quiet and solitude, manageability of boundaries, and special features (ecological, geological, scenic, cultural features).
- Exception:** An exception, modification, or waiver may be granted if the Forest Plan designation changes so that the area is no longer classified as semiprimitive nonmotorized, or if the operator can demonstrate in a surface use plan of operations that the activity can be conducted with minimal impacts on the semiprimitive, nonmotorized characteristics within a site-specific locale. A public notice and comment period is required prior to waiver, exception, or modification of this stipulation.

¹ Sensitive areas containing geologic hazards, riparian areas, etc., that are 3 acres or less in size are excluded from the stipulation map as they can be avoided through standard terms and conditions that allow for moving proposed facilities up to 200 meters (656 feet) to avoid adverse resource impacts.

Resource: Heritage Resources

- Stipulation:** No Surface Occupancy
- Location:** Two sites on the National Register of Historic Places: Nogales Cliff House (110 acres) and Rattlesnake Ridge (90 acres).
- Purpose:** To avoid surface disturbance activities that would result in irreversible loss of this resource within these distinct localized areas where heritage resource avoidance or data recovery are not viable options. These are significant heritage resource sites on the National Register of Historic Places that are important interpretive sites.
- Exception:** An exception, modification, or waiver may be granted if a site-specific surface use plan of operations demonstrates that adverse impacts to the heritage resources can be completely avoided, and clearance is obtained from the forest archeologist and State Historic Preservation Officer. A public notice and comment period is required prior to waiver, exception, or modification of this stipulation.

Resource: Mexican Spotted Owl

- Stipulation:** Timing limitation on drilling operations and construction activities: March 1 to August 31.
- Location:** Currently there are four designated protected activity centers (PACs) ranging in size from 365 to 610 acres. Would apply wherever there is a designated PAC.
- Purpose:** To protect and limit disturbance from drilling and construction activities within Mexican spotted owl PACs (nesting/fledgling areas) to minimize risks to reproductive and post-fledgling success of Mexican spotted owls during the critical nesting/breeding period defined in the recovery plan for this federally listed threatened species as well as the Forest Plan (Appendix D, pg. 2). Would not apply to daily operations and maintenance of producing wells.
- Exception:** An exception, modification, or waiver to the timing limitation may be granted if surveys according to protocol are conducted and the area is not used for nesting. A public notice and comment period is required prior to waiver, exception, or modification of this stipulation.

Resource: Northern Goshawk

- Stipulation:** Timing limitation on drilling operations and construction activities: March 1 to September 30.
- Location:** There are currently three post-fledgling areas (PFAs) ranging in size from 46 to almost 300 acres. Would apply wherever there is a designated PFA.
- Purpose:** To protect and limit disturbance from drilling and construction within northern goshawk nesting PFAs to minimize risks to reproductive and post-fledgling success of northern goshawks during the critical nesting/breeding period defined in interagency goshawk guidelines and the Forest Plan (Appendix D, pp. 6, 10). Would not apply to daily operation and maintenance of producing wells.

Exception: An exception, modification, or waiver to the timing limitation may be granted if goshawk surveys show that the area is not used for nesting.

Resource: Peregrine Falcon

Stipulation: Timing limitation on drilling operations and construction activities: March 1 to August 15.

Location: Currently there is one peregrine falcon eyrie nesting area consisting of 935 acres. Would apply wherever there is a designated eyrie.

Purpose: To protect and limit disturbance from drilling and construction within peregrine falcon habitat to minimize risks to reproductive and post-fledgling success of peregrine falcons during the critical nesting/breeding period, consistent with the Forest Plan (pg. 63) and Agency directives. Would not apply to daily operation and maintenance of producing wells.

Exception: An exception, modification or waiver to the timing limitation may be granted if surveys show that the area is not used for nesting.

Resource: Deer and Elk Winter Range

Stipulation: Timing limitation on drilling operations and construction activities: December 15 to March 15.

Location: Two areas along the northwest edge of the oil-gas study area have been identified as winter range for deer and elk totaling 22,390 acres.

Purpose: To protect and limit disturbance from drilling and construction within prime deer and elk winter range to minimize risks to health during a critical period, consistent with recommendations from New Mexico Department of Game and Fish (NMDGF) and summarized under Issue 1 in Chapter 1. Would not apply to daily operation and maintenance of producing wells.

Exception: An exception, modification, or waiver to the timing limitation may be granted if the operator demonstrates that the drilling/construction location would not disrupt deer and elk winter habitat.

Resource: Deer Fawning/Elk Calving Area

Stipulation: Timing limitation on drilling operations and construction activities: June 1 to July 31.

Location: One area in the southern portion of the oil-gas study area has been identified as important to the success of deer fawning and elk calving consisting of 9,600 acres.

Purpose: To protect and limit disturbance from drilling and construction within important deer fawning/elk calving area to minimize risks to herd reproduction during a critical period, consistent with recommendations from NMDGF and summarized under "Issue 1" in chapter 1. Would not apply to daily operation and maintenance of producing wells.

Exception: An exception, modification, or waiver to the timing limitation may be granted if the operator demonstrates that the drilling/construction location would not disrupt deer fawning and elk calving.

Resource: Riparian Areas and Wetlands

Stipulation: Controlled Surface Use: avoid well pads and attendant facilities within wetlands and riparian areas². Access roads and pipelines would be allowed if there are no practical alternative locations and they are located and designed to minimize adverse impacts to riparian or wetland resources.

Location: Narrow areas ranging in size from less than 0.01 to 350 acres, where the forest's terrestrial ecosystem survey and vegetation data indicates riparian or wetland conditions (hydrology, hydrophytic plants, hydric soil), including active flood plains. Some overlap other proposed CSU and NSO areas.

Purpose: To avoid adverse impacts to riparian and wetland resources, consistent with law, regulation, and policy.

Exception: An exception, modification or waiver may be granted if surveys show that the area of proposed activity is not wetland or riparian, and road crossings of riparian areas may be approved if the operator can demonstrate that there are no practicable alternatives and that adverse effects of a road crossing through the riparian area or wetland can be minimized. A public notice and comment period is required prior to waiver, exception, or modification waiver of this stipulation.

Resource: Retention Visual Quality Objective (High Scenic Integrity Objective)

Stipulation: Controlled Surface Use: locate and design surface disturbance activities to be consistent with the visual quality objective of "retention" (or the scenic integrity of "high"), or to reclaim disturbed areas to meet the visual quality objective within 1 to 3 years from project startup. Generally, this can be met by following industry's best management practices for minimizing impacts to visual quality, along with visual quality guidelines in the Forest Plan and Forest Service Scenery Management System Handbook (Agriculture Handbook 701).

Location: Currently, Management Area D, in addition to a few narrow road or trail corridors, comprises Forest Plan designated areas to be managed for the "retention" visual quality objective (VQO). The visual foreground along those designated roads and trails must be managed to meet "retention" VQO standards. The foreground "retention" corridors are mapped at one-half mile on each side of the road or trail, but may be less, based on site-specific conditions. They range in size from less than 1 acre to 5,200 acres and may overlap other CSU or NSO areas. Would apply wherever "retention" or high scenic integrity is the visual quality objective, including the following areas:

- NM Highway 112 within Management Area R (Forest Plan pg. 167)

² Includes Terrestrial Ecosystem Units 3-8, 10, 11, 13, 31, 33, 34, 38, 234, 320, and 334, or other areas identified during onsite inspection.

- NM Highway 44 (U.S. Highway 550) through Cuba Mesa, Management Area E (Forest Plan pg. 118) and the Cuba Ranger District administrative site north of Cuba.
- Continental Divide Trail sections along Cecilia Creek and a portion of Forest Road 95 within Management Area E (Forest Plan pg. 118).
- Management Area D, including small portions just north of and adjacent to the Village of Gallina, as well as along NM Highway 126/Scenic Byway corridor just west of and adjacent to San Pedro Parks Wilderness (Forest Plan pg. 113).

Purpose: Needed to protect the long-term scenic values in areas of high scenic integrity consistent with Agency directives and the Forest Plan. The Continental Divide Trail is a designated national scenic trail and Highway 126 is a designated scenic byway.

Exception: An exception, modification or waiver may be granted if the area is reclassified to a lower visual quality or scenic integrity objective.

Resource: Heritage Resources

Stipulation: Controlled Surface Use: avoid or minimize well pads, roads, or other surface disturbance activities within existing and proposed Management Area I boundaries.

Location: There are two existing Management Area I designations and six other proposed areas that qualify for heritage resource protection, based on Forest Plan criteria. The proposed new heritage resource areas with CSU lease stipulations range in size from 100 to 750 acres each and may overlap other CSU areas.

Purpose: Needed to avoid adverse impacts or an irreversible loss of heritage resources within localized areas containing a high density of highly significant heritage resource sites. These sites are eligible for inclusion to the National Register of Historic Places and meet the management emphasis for Forest Plan Management Area I. These areas represent the major cultures that once lived on the Santa Fe National Forest.

Exception: An exception, modification, or waiver may be granted if a site-specific surface use plan of operations demonstrates that adverse impacts to the heritage resources can be completely avoided, and clearance is obtained from the forest archeologist and State Historic Preservation Officer. A public notice and comment period is required prior to waiver, exception, or modification of this stipulation.

Alternative 3

In response to public scoping comments regarding protection of roadless and wilderness areas, this alternative increases the acreage of NSO lease stipulations, while all other lease stipulations in the Proposed Action would be the same. Under this alternative, all inventoried roadless areas outside Management Area L and a one-half mile buffer around San Pedro Parks Wilderness are proposed for an NSO lease stipulation. These NSO lease stipulations would apply in addition to

the areas proposed under Alternative 2. Figure OG-13 shows the location of all lease stipulations proposed under Alternative 3.

Resource: Inventoried Roadless Areas (outside Management Area L)

- Stipulation:** No surface occupancy
- Location:** There are three areas ranging from 820 to 1,530 acres that lie outside Management Area L proposed for NSO under the Proposed Action. Would expand the NSO area to all designated inventoried roadless areas (IRA).
- Purpose:** The IRAs consist of old RARE II (Roadless Area Review and Evaluation, January 1979) wilderness study areas that were designated for special protection in the 2000 USDA Forest Service Roadless Conservation Area Rule, 2001 regulations at 36 CFR 294 and Interim Directive 1920-2004-1. In 2004, regulations at 36 CFR 294 and the Department's Interim Directive were replaced, yet still require managing for conservation of roadless area characteristics. This NSO stipulation would help protect and maintain the roadless characteristics within designated IRAs, consistent with the intent of 36 CFR 294.
- Exception:** An exception, modification, or waiver may be granted by the Regional Forester if, upon future reviews, the area is no longer designated as an IRA, or regulations or directives change to allow road construction and other surface disturbing activities within IRAs. A public notice and comment period is required prior to waiver, exception, or modification of this stipulation.

Resource: San Pedro Parks Wilderness Area Buffer

- Stipulation:** No surface occupancy
- Location:** A one-half mile buffer within the oil-gas study area adjacent to the San Pedro Parks Wilderness boundary, totaling 6,160 acres. This area would overlap other proposed lease stipulations.
- Purpose:** This would enhance the wilderness experience by limiting industrial activities that have the potential to create constant noise and vehicle traffic near the wilderness area. It would not eliminate existing roads or vehicle traffic, but is intended to limit future oil and gas development and its associated activities that may affect the wilderness experience.
- Exception:** An exception, modification, or waiver may be granted if the operator can demonstrate that adverse impacts to use of the wilderness area can be completely avoided and if no alternative locations were available to access the mineral resource. A public notice and comment period is required prior to waiver, exception, or modification of this stipulation.

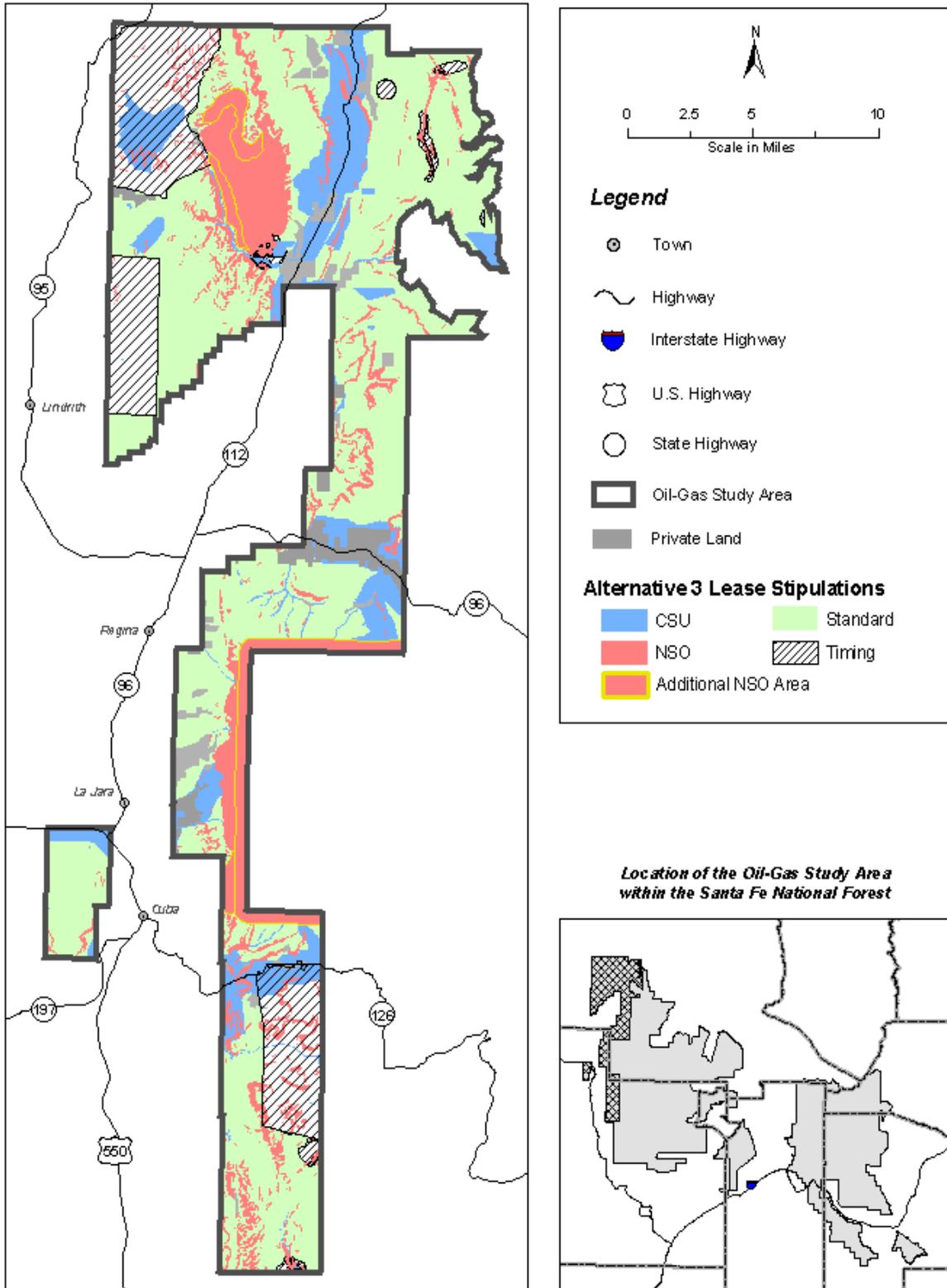


Figure OG-13. Alternative 3: All lease stipulations within the study area

Mitigation Measures

There are no site-specific mitigation measures or monitoring requirements for the action alternatives because this is a programmatic EIS that does not authorize any oil-gas related land-disturbing activities on National Forest System lands in the study area.

The Forest Service develops COAs to be implemented as mitigation measures, in addition to those typically implemented to comply with State and Federal laws, regulations, and policies. COAs would include site-specific measures designed to mitigate adverse impacts or unacceptable damage to soil, water, air, vegetation, wildlife, fish, recreation, scenery, heritage resources, existing infrastructure, and private land uses. Through the review of surface use plans of operations during the APD process, the Forest Service would ensure that applicable COAs are consistent with those used on Federal lands within the San Juan Basin, such as those developed for noise reduction, air quality mitigation, and reclamation standards.

Appendix A contains a list of the standard terms and conditions and COAs that are typically applied as mitigation measures at APD. Appendix B includes some Federal regulations that govern the planning and environmental protection responsibilities of the BLM and Forest Service during the APD process that address how impacts should be mitigated and lease terms are to be enforced.

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by the NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of determining Forest Plan leasing availability and associated stipulations for new leases within the oil-gas study area, duplicative of the alternatives considered in detail, topics to be addressed under effects analyses, or constraints on oil-gas development determined to be not feasible or inconsistent with providing reasonable access to minerals. Therefore, some potential alternatives were considered, but dismissed from detailed consideration for reasons summarized below.

Limit the Hours of Human Presence at Oil-Gas Drilling Sites

One scoping comment recommended limiting human presence at drill sites to between 9 a.m. and 3 p.m. to avoid wildlife feeding and movement periods. This alternative was eliminated from detailed consideration because it would be too restrictive and costly to meet Forest Service requirements to allow reasonable access to mineral resources. Drilling operations are frequently conducted 24 hours a day for a short period in order to make the best use of the drilling equipment. Limiting operations to a 6-hour period each day would extend the vehicle traffic, noise, and concentrated human activity over many more days, which would be expensive for industry and may be more disruptive to wildlife.

Additional Timing Limitations for Migratory Bird Protection

A commenter recommended limiting construction activities to a period outside the general migratory bird nesting season of March through August, unless the areas proposed for

construction during the nesting season would first be surveyed, and when occupied, avoided until nesting is complete, in order to minimize the likelihood of adverse impacts to all birds protected under the Migratory Bird Treaty Act. This proposal was eliminated from detailed study because TLs in several areas under the Proposed Action would already eliminate construction activities during much of this period and new areas could be added if warranted. In addition, there are no important bird areas identified within the study area. Additional areas with proposed TLs have not been delineated by State or Federal agency biologists for birds other than the raptor areas identified by field surveys. Field survey information is not available to clearly delineate additional areas and the proposed NSO and CSU areas would provide additional protection of specific locations like nests, while allowing reasonable access to minerals.

Large Areas of No Leasing to Protect Wildlife Habitat

Comments recommended that there should be large areas, either several sections throughout the forest or 2-mile buffers around San Pedro Parks Wilderness, Gallina, Llaves, and east of Lindrith, held unavailable to leasing in order to provide refuge for wildlife. This EIS only addresses leasing within the oil-gas study area defined because that is the part of the Santa Fe National Forest that may have oil or gas resources sufficient to be developed. This alternative was eliminated from detailed study because the Forest Service determined that the large unleased areas within the Santa Fe National Forest outside the study area, in addition to proposed NSO areas, would maintain blocks of wildlife habitat undisturbed by oil-gas operations while still allowing reasonable access to minerals.

NSO within 300 Feet of Wetlands, Flood Plains, and Riparian Areas

Consideration of an NSO stipulation within a 300-foot buffer around wetlands, riparian areas, and 100-year flood plains was eliminated from detailed study for several reasons. Riparian areas, wetlands, and flood plains in the study area tend to be narrow, linear features that can be avoided during the APD process under the current regulation (43 CFR §3101.1-2) that enables the location of oil-gas facilities to be moved up to 200 meters (656 feet) from industry-proposed sites to protect surface resources. One hundred-year flood plains have not been delineated in the forest and would require detailed hydrologic modeling that is unnecessary because they could be avoided according to the 200-meter regulation.

Full-Field Development of Oil and Gas

Full-field development, which entails drilling wells on the standard spacing of 160 acres throughout the study area, was considered. This alternative was not analyzed in detail because it was determined in the RFDS that there is little potential for this to occur under current and foreseeable future conditions. This conclusion was supported by area oil and gas operators who were queried during public scoping.

Retroactive Application of Lease Stipulations

During the public comment period for the draft EIS, a commenter requested that the Forest Service consider applying the new lease stipulations to existing leases. Existing leases are contracts that cannot be modified to add new stipulations or constraints that alter the basic terms

and conditions of the lease. Therefore, this alternative was not carried forward for detailed analysis.

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in Table OG-3 is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table OG-3. Comparison of impacts under each alternative

Resources	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
Minerals	Inadequate protection of sensitive surface resources, while allowing additional minerals development.	Proposed stipulations would not affect valid existing leases. Future leasing and development would provide improved protection of surface resources.	Increased protection of surface resources with additional protection within one-half mile of IRA and wilderness areas under proposed stipulations on new leases. More directional drilling would be required to access leases in NSO areas.
Soils and Watershed Management	No direct impacts to soils. Provides fewest protections to soils and watershed management under standard terms and conditions.	NSO stipulations on new leases would protect almost 26,000 acres on steep slopes, if leased.	NSO stipulations on new leases would protect almost 30,000 acres on steep slopes, if leased.
Water Resources	No direct impacts to water resources. Provides least amount of protection of downstream surface water from future development. Compliance with laws and regulations would minimize impacts.	No direct impacts to water resources. Provides more protection of downstream surface water from future development than Alternative 1. Compliance with laws and regulations would minimize impacts.	No direct impacts to water resources. Provides more protection of downstream surface water from future development than Alternative 2. Compliance with laws and regulations would minimize impacts.
Air Quality	No alternative would result in an increase or decrease in the number of wells projected in the study area, so there would be no direct impacts to air quality.		
Vegetation	16,506 acres with CSU leasing restrictions that minimize impacts to vegetation.	71,948 acres with CSU or NSO leasing restrictions that minimize impacts to vegetation.	81,865 acres with CSU or NSO leasing restrictions that minimize impacts to vegetation.
Wildlife Habitat	Provides the fewest restrictions on surface disturbance through lease stipulations, and the least amount of surface protection for wildlife habitat.	Provides the second highest amount of restrictions on surface disturbance (NSO approximately 12,100 acres) through lease stipulations, and the second most surface protection for wildlife habitat.	Provides the most restrictions on surface disturbance (NSO approximately 18,960 acres) through lease stipulations, and the highest amount of surface protection for wildlife habitat.
Management Indicator Species	No change to management indicator species populations or habitat trends would result under any alternative.		

Table OG-3. Comparison of impacts under each alternative

Resources	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
Migratory Bird Habitat	No direct impacts to migratory bird habitat. Provides the least protection of habitat on future leases.	No direct impacts to migratory bird habitat. Provides the second greatest protection of habitat on future leases.	No direct impacts to heritage resources. Provides slightly more protection on future leases.
Threatened, Endangered, and Sensitive Species	No effect to any listed species would result.		
Heritage Resources	No direct impacts to heritage resources. Provides the least protection on future leases.	No direct impacts to heritage resources. Provides the second most protection on future leases.	No direct impacts to heritage resources. Provides the highest protection on future leases.
Recreation and Wilderness	No direct impacts. No change in current Forest Plan which provides limited surface use in Management Area L.	Additional protection through NSO stipulations on new leases would limit surface disturbance and well development, providing protection for some key recreation and wilderness areas.	Provides more surface protection for San Pedro Parks Wilderness than Alternative 2, providing additional protection for some key recreation and wilderness areas.
Inventoried Roadless Areas	IRAs are currently covered by Limited Surface Use in Forest Plan Management Area L, which does not preclude road construction.	NSO lease stipulations in IRAs in Management Area L would limit new road construction.	Expands NSO to include IRAs outside of Management Area L, providing additional limitations on road construction within IRAs.
Visual Resources	No direct impacts. Future development projected to occur in Management Areas R and S where there are existing oil-gas wells and visual resource management is a low priority.	No direct impacts. Additional protection of Management Area L through NSO stipulations on new leases would help to retain visual resource integrity in this area designated as retention.	No direct impacts. All of Management Area L would be protected by NSO stipulations on new leases, providing protection of the retention visual quality objective.
Livestock Grazing	No direct impact. Greatest indirect impacts on rangeland health and forage production due to least restrictive leasing stipulations and a likelihood to increase the extent of surface disturbance and noxious weeds.	No direct impact. Indirect impacts on rangeland health and forage production would be second highest, due to more restrictive leasing stipulations to limit the extent of surface disturbance and noxious weeds on new leases.	No direct impact. Indirect impacts on rangeland health and forage production would be highest, due to the most restrictive leasing stipulations to limit the extent of surface disturbance and noxious weeds on new leases.
Fire Management	No impacts under any alternative.		

Table OG-3. Comparison of impacts under each alternative

Resources	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
Social Environment	No significant impacts or differences across alternatives.		
Economics	No impacts to economic conditions.	Development of new leases may be more expensive than under Alternative 1, due to the proposed NSO stipulations. The quantity of economically recoverable reserves could be lower than Alternative 1 due to directional drilling on new leases. This may cause slight decreases in employment, income, and tax revenues if new leases were developed in the future.	Development of new leases may be more expensive than under Alternative 2, due to the proposed increased acreage of NSO stipulations. The quantity of economically recoverable reserves could be lower than Alternative 2 due to directional drilling on new leases. This may cause slight decreases in employment, income, and tax revenues if new leases were developed in the future.
Environmental Justice	Little or no effect on minority and low-income populations under any alternative.		

