INTRODUCTION

Oil and gas (natural gas and carbon dioxide) are defined as leasable minerals under federal law and regulation. The Bureau of Land Management (BLM) has jurisdiction over management of federal oil and gas resources underlying both BLM and National Forest System (NFS) lands, as well as those underlying non-federal surface (split estate) lands within the San Juan Public Lands (SJPL). The BLM and Forest Service are joint agencies in this analysis under the 2006 Memorandum of Understanding Concerning Oil and gas Leasing and Operations. For BLM lands and federal leasable minerals under non-federal surface lands, BLM administers all oil and gas leasing and development activity. BLM analyzes and makes decisions on leasing and discloses those decisions in its Resource Management Plan. Under the Federal Onshore Oil and Gas Leasing Reform Act of 1987 and implementing regulations at Title 36, Code of Federal Regulations Part 228 E, the Forest Service must analyze and make decisions on mineral leasing for federal leasable minerals underlying NFS lands. Once those decisions are made, BLM may offer the selected NFS lands for lease consistent with those decisions.

BLM published its San Juan/San Miguel Planning Unit Resource Management Plan in 1985 and amended it in 1991. The Forest Service published its San Juan National Forest Plan in 1983 and amended it in 1992. Under the Service First initiative adopted by the San Juan Resource Area (BLM) and the San Juan National Forest (Forest Service), this plan revision includes analysis and decision on oil and gas leasing on BLM lands, and is accompanied by a leasing availability decision for NFS lands.

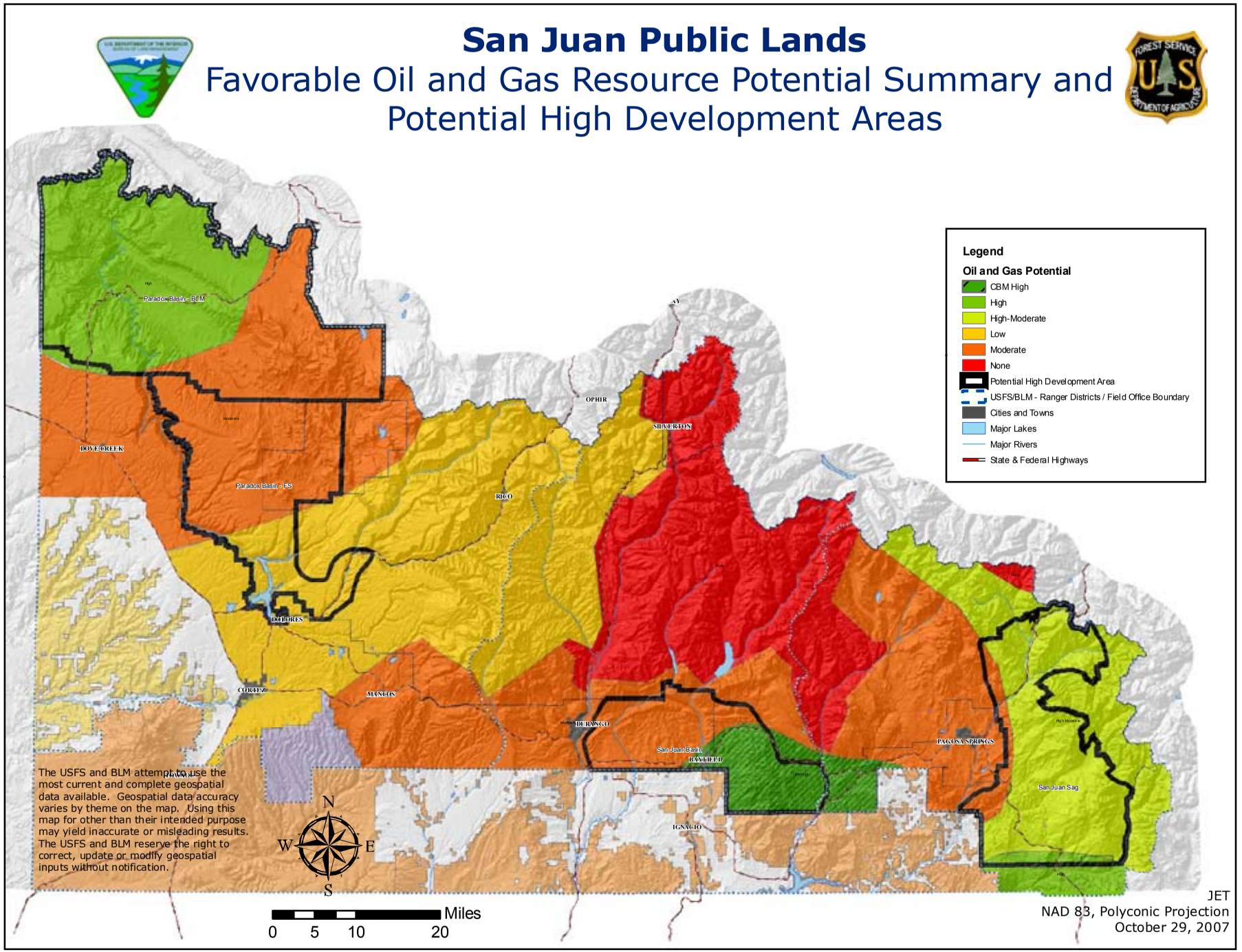
The leasing decisions are tied to the land management plan. The following analysis applies to a total of 2.09 million acres of federal minerals within a three million-acre analysis area, of which 1.67 million acres of federal leasable mineral estate (outside of wilderness and administratively withdrawn areas) have the potential for the occurrence of oil and gas resources, as disclosed in the analysis contained in Table 3.15.1. The remaining 0.94 million acres within the planning area are not included in this oil and gas leasing analysis because the federal government has no authority over privately held minerals regardless of surface ownership.

Oil and Gas Affected Environment, Figure 3.15.1, illustrates the estimated potential for the occurrence of oil and gas resources in the SJPL.

Table 3.15.1 - Potential for Occurrence of Oil and Gas Resources by Mineral Estate

STATUS	NO KNOWN	LOW	MODERATE	MODERATE-HIGH	HIGH	TOTAL ACRES
Federal Surface	380,395	500,462	465,993	219,983	266,363	1.833,197
State Surface, Federal Minerals	11	491	23,872	0	2,272	26,645
Private Surface, Federal Minerals	63,714	17,496	124,971	20,969	28,823	255,973
Total	444,120	518,449	614,836	240,952	297,458	2,115,815

Figure 3.15.1 - Favorable Oil and Gas Resource Potential Summary and Potential High Development Areas



Currently 528,000 acres of public land (439,000, BLM and 89,500, NF) are leased for oil and gas development. The San Juan National Forest is operating under leasing decisions made in 1983 in conjunction with development of the unit's land and resource management plan (LRMP). The BLM San Juan Field Office leasing decisions where made in 1985 as part of the unit's development and approval of a resource management plan (RMP). The BLM amended its leasing decisions in 1991 as part of a Colorado statewide mineral-leasing reanalysis. The current leasing decisions for the two units that make up the San Juan Public Lands are thus 15 to 23 years old, respectively.

As an integral part of the plans' revisions, leasing decisions made in the prior plan are also to be revised. There is an option within the applicable Forest Service regulations to conduct this process separate of the LRMP/RMP revisions; however, we believe the approach of lease revision made in concert with LRPM/RMP revision presents the best opportunity to achieve an integrated approach to resource management planning.

LAWS, POLICY, DIRECTION

Oil and gas resources on NFS and BLM lands are managed under a large body of laws and regulations. A few, however, are specific to the mineral resource itself and provide direction on the disposition of federally owned oil and gas resources, as well as administration of surface activities associated with development of these resources.

Mineral Leasing Act of 1920 – This act authorizes the Secretary of Interior to issue leases for the disposal of certain minerals (currently applies to coal, phosphate, sodium, potassium, oil, oil shale, gilsonite, and gas). The act applies to National Forest lands reserved from the public domain, including lands received in exchange for timber or other public domain lands and lands with minerals reserved under special authority.

Mineral Leasing Act for Acquired Lands of 1947 - This act states that all deposits of coal, phosphate, oil, oil shale, gas, sodium, potassium, and sulfur that are owned or may be acquired by the United States and that are within lands acquired by the United States may be leased by the Secretary of Interior under the same conditions as contained in the leasing provisions of the mineral leasing laws. No mineral deposits shall be leased without the consent of the head of the executive department having jurisdiction over the lands containing the deposit and subject to such conditions as that official may prescribe.

The Domestic Minerals Program Extension Act of 1953 – This act states that each department and agency of the federal government charged with responsibilities concerning the discovery, development, production, and acquisition of strategic or critical minerals and metals shall undertake to decrease further, and to eliminate where possible, the dependency of the United States on overseas sources of supply of each such material. Mining and Minerals Policy Act of 1970 - This act states that the continuing policy of the federal government is to foster and encourage private enterprise in the development of economically sound and stable domestic mining and minerals industries and the orderly and economic development of domestic mineral resources. The Federal Land Policy and Management Act of 1976 – This reiterates that the 1970 Mining and Minerals Policy Act shall be implemented and directs that public lands be managed in a manner which recognizes the nation's need for domestic sources of minerals and other resources.

Energy Security Act of 1980 - This act directs the Secretary of Agriculture to process applications for leases and permits to explore, drill, and develop resources on NFS lands, notwithstanding the current status of any management plan being prepared.

The National Materials and Minerals Policy, Research and Development Act of 1980 - This requires the Secretary of Interior to improve the quality of minerals data in federal land use decision-making.

The Federal Onshore Oil and Gas Leasing Reform Act of 1987 - This act expands the authority of the Secretary of Agriculture in the management of oil and gas resources on NFS lands. Without Forest Service approval, BLM cannot issue leases for oil and gas on NFS lands over the objection of the Forest Service. The Forest Service also has the authority to regulate all surface disturbing activities on NFS lands.

The Energy Policy Act of 2005 – This act encourages energy efficiency and conservation; promotes alternative and renewable energy sources; reduces dependence on foreign sources of energy, increases domestic production, modernizes the electrical grid, and encourages the expansion of nuclear energy. The BLM and Forest Service are responsible for making public lands available for orderly and efficient development of these resources under principles of multiple-use management.

PROCESS FOR MINERAL LEASING AND OIL AND GAS EXPLORATION AND DEVELOPMENT

This section provides additional information on: (1) the decisions made in the LRMP/RMP revisions related to leasing of federal minerals, and (2) the overall process for leasing, exploration, and development of oil and gas resources. An overview of this process is important because it illustrates the sequence of decisions and planning that lead from leasing to ultimate development of the oil and gas resource.

The Records of Decision for the LRMP/RMP revisions and the Forest Service leasing availability analysis will make the following decisions related to mineral leasing:

- ***For BLM lands***: lands open for leasing [BLM Handbook H1601-1], including conditions (stipulations) under which lands will be open for leasing. A plan-level decision to open the lands to leasing represents BLM's determination, based on the information available at the time, that it is appropriate to allow development of the parcel consistent with the terms of the lease, laws, regulations, and orders, and subject to reasonable conditions of approval. (selected alternative will be approval in the LRMP/RMP Record of Decision)
- ***For NFS lands***: lands administratively available for leasing [36 CFR 228.102(d)], including conditions (stipulations) under which lands will be available. (selected alternative will be approved in a Forest Service leasing availability Record of Decision)

The Forest Service availability decision and BLM leasing decision constitute Stage 1 of a three-stage decision-making process for oil and gas leasing, exploration, and development (Table 3.15.2). Neither leasing decision authorizes ground-disturbing activity. Ground-disturbing activity will be authorized through an Application for Permit to Drill (APD) for an exploration well (Stage 2), and, in the event of a discovery, through a development plan (Stage 3). Environmental analysis and decision-making (NEPA analysis) specific to such proposals (APDs and development plans) will be conducted when and if industry submits such proposals. All areas of the National Forest and BLM public lands excusive of areas currently withdrawn from leasing and those currently administratively unavailable for leasing are analyzed. These lands include:

- The portions of the San Juan National Forest currently available for leasing – 1,384,896 acres
- The entire BLM San Juan Field Office public lands including split-estate lands - 704,274 acres

Thus the net acreage analyzed for leasing on both federal jurisdictions totals 2,115,815 acres. The Reasonably Foreseeable Development projections for future oil and gas development activity forecast activities within a broad area of 928,000 acres of lands classified as having high, moderate and low potential for oil and gas. Within that area there would be approximately 1,800 acres of land disturbance as a result of oil and gas exploration and development. These lands generally coincide with lands that are already leased and undergoing some level of development, are leased and currently undeveloped, or where industry has nominated areas for lease.

Table 3.15.2 – Three Stages of Forest Service and BLM Decision-Making Process or Leasing, Exploration, and Development

Stage 1 – Leasing *Determination of lands available for leasing (USFS) and Lands Open to Leasing (BLM); offering, sale, and issuance of leases* NEPA analysis and decision on which lands will be available for leasing (USFS) or open to leasing (BLM), including determination of lands available or open to development with standard lease terms, lands available or open to development but subject to special constraints (stipulations), and lands closed to leasing, with distinction between areas closed by law or regulation and areas closed through exercise of management direction by the Forest Service and/or BLM (discretionary no lease). Implementation of leasing decisions consists of the following: • Industry submission of an Expression of Interest for a lease or leases to BLM; • BLM and FS verification and validation that leasing has been adequately addressed in a NEPA document and is consistent with the applicable management plan; assurance that conditions of surface occupancy identified in the leasing availability decision are properly included as stipulations; and determination that operations and development could be allowed somewhere on each proposed lease, except where stipulations prohibit all surface occupancy. • Offering of lease on a regularly scheduled competitive sale. • Issuance of lease to high bidder, or lease available over the counter after sale if no bid received.
Stage 2 – Exploration – Application for Permit to Drill (APD) Proposal to drill exploratory well on valid federal lease in previously unexplored or undeveloped area. Proposal is for ground-disturbing activity and is subject to NEPA analysis and decision specific to proposal. Implementation consists of lessee/operator drilling the authorized well, followed by completion or plugging and abandonment depending on the well's production capabilities.
Stage 3 – Development – Development Plan Proposal to drill one or more wells to develop a field. Proposal is for ground-disturbing activity and is subject to NEPA analysis and decision specific to proposal. Implementation consists of lessee/operator drilling and completing authorized wells.

CONDUCTING THE LEASING ANALYSIS

The leasing analysis provides the basis for making the leasing decision. Following direction in 36 CFR 228 102 (c) (I) and BLM Handbook H1601-1, the analysis identifies:

- Lands open to development with standard lease terms (described in Section 6 of every lease).
- Lands open to development, but subject to constraints that require the use of supplementary lease stipulations when the standard lease terms are not sufficient to protect surface and subsurface resources.

Lands closed to leasing, distinguishing between those areas closed through exercise of management direction by the Forest Service or BLM and those closed by law or regulation. Such lands are identified in the oil and gas leasing maps for the alternatives.

- Mitigation measures in the form of lease stipulations related to the different emphases of the alternatives for oil and gas management.

Based on their goals and resulting management emphasis, LRMP/RMP Alternatives A and D emphasize more access for leasing and development with less restrictions. Alternatives B and C use more restrictions. No-leasing Alternative provides for no leasing of federal oil and gas on currently unleased ands and on leased lands when the current lease expires. After analyzing the effects of development on surface resources, including consideration of environmentally sound drilling technology, reclamation, and effects of prohibiting surface occupancy, the Forest Service or BLM may determine that the impacts are unacceptable for some areas. These areas may be closed to leasing at the discretion of the Forest Service or BLM.

The analysis also:

- Identifies land management alternatives which result in a range of possible leasing decisions [36 CFR 228.102 (c) (2) and BLM Handbook H1624-1].
- Includes a projection of the type and amount of post-leasing activity that is reasonably foreseeable as a consequence of conducting a leasing program consistent with that described in the proposal and for each alternative [36 CFR 228.102 (c) (3), and BLM Handbook H1624-1]
- Analyzes the reasonable foreseeable impact of post-leasing activity projected for the proposal and for each alternative [36 CFR 228.102 (c) (3) and BLM Handbook H1624-1)]
- These three requirements are addressed below.

EXISTING CONDITIONS AND TRENDS

The existing condition is a result of the discovery and development of oil and gas resources. In addition to these known and developed resources, the existing condition includes estimates of the potential for the occurrence of undiscovered oil and gas resources, and the likelihood of their development during the 15 -year planning period. This Oil and Gas Leasing Analysis is divided into the following major topics:

- Oil and Gas Occurrence Potential in SJPL
- Major Oil and Gas Plays
- Scenario for Future Oil and Gas Exploration and Development Activity
- Trends in Recent Development and Exploration Activity
- Reasonable Foreseeable Development in SJPL

Each topic section provides a summary of the relevant data.

OIL AND GAS OCCURRENCE POTENTIAL IN SJPL

The Reasonable Foreseeable Development (RFD) analysis projects oil and gas development for the SJPL. It is based on an assessment of the potential for the occurrence of oil and gas, and an estimate of the level and type of development activity that might occur, should the affected lands be leased. This section of the analysis describes regions of different potential for accumulations of oil and gas in the SJPL. The estimate of development activity is described in a following section.

A region of defined oil and gas resource potential may include adjacent non-SJPL lands where the geology and exploration and development activity are important to describing potential for oil and gas resources in the SJPL. The potential for occurrence of oil and gas in the SJPL is based on the geology and major plays in the SJPL. Table 3.15.1, above, summarizes the potential for the occurrence of oil and gas in the SJPL.

The criteria used for designation of potential are from BLM Handbook H-1624-1, revised Dec. 19, 1994:

- ***High potential***: The play demonstrates existence of source rock, thermal maturation, reservoir strata possessing permeability and porosity, and traps. Demonstrated existence is defined by physical evidence or documentation in the literature.
- ***Medium potential***: The play has geophysical or geological indications that the following may be present: source rock, thermal maturation, reservoir strata possessing permeability and porosity, and traps. Geologic indication is defined by geological inference based on indirect evidence.
- ***Low potential***: The play has specific geophysical or geological indications that one or more of the following may not be present: source rock, thermal maturation, reservoir strata possessing permeability and porosity, and (or) traps.
- ***No potential***: The play has no currently recognizable potential. The play has demonstrated absence of source rock, thermal maturation, reservoir rack, and traps. Demonstrated absence is defined by physical evidence or documentation in the literature.

The following discussion provides information from which the oil and gas occurrence potential summary is derived, broken down by specific oil and gas province and play. Within each play, there may be several different estimates of potential for individual rock formations.

SAN JUAN BASIN PROVINCE

High potential

Lands with high potential in Cretaceous rocks are present in the SJPL in the extreme northern part of the San Juan Basin Province. Productive oil and gas fields such as the Ignacio-Blanco and Fruitland–Picture Cliffs, and production from the Dakota, “tight” Dakota, and Mesa Verde plays are in and/or immediately adjacent to the SJPL. The oil and gas potential of fractured Mancos is considered to be high, particularly in the sandier and more dolomitic El Vado member of the Mancos Shale. The potential for future oil and gas discoveries and development is high where the Dakota and younger rocks are present.

Medium potential

Within the Northern San Juan Basin area, the lands that overlie the Entrada Sandstone are prospective. This is particularly true in the vicinity of the southwestern flank of the Archuleta Anticlinorium on the northeastern flank of the San Juan Basin Province. Medium potential is also assigned to the Pennsylvanian rocks in the San Juan Basin Province part of the SJPL.

Low potential
Tertiary, Mississippian and Devonian rocks in the SJPL are of low potential at present, although escalating oil prices may drive exploration interest higher with time.

No currently recognizable potential
The rocks below the Mississippian, if present, do not have any currently recognizable potential, although escalating oil prices may drive exploration interest higher with time.

SAN JUAN SAG AREA

High potential
Cretaceous rocks in the southern and southwestern part of the San Juan Sag generally dip northeasterly away from the Archuleta Anticlinorium that separates the San Juan Sag from the San Juan Basin. The primary reservoirs are the Dakota and possible fractured shale of the Mancos. The Mesa Verde is also a potential objective in the northeastern part of the SJPL in the San Juan Sag area. The Dakota and fractured Mancos Shale potential is considered to be high in this part of the SJPL where Cretaceous outcrops and subcrops are not covered by thick volcanic flows.

Medium potential
The Entrada Sandstone has medium potential in the San Juan Sag part of the SJPL. This is particularly true along the northeastern flank of the Archuleta Anticlinorium.

Low potential
Very little is known about the Pennsylvanian section in the San Juan Sag area. However it has been mentioned by several operators as a possible objective, if present, beneath the Mesozoic rocks in the sag. It is therefore given a low potential.

No current recognizable potential
Mississippian and/or Devonian and older Paleozoic rocks are virtually unexplored and no recognizable potential is given to this stratigraphic package.

PARADOX BASIN PROVINCE

High potential
Actively producing fields in the Andy's Mesa, Cache, Cocklebur Draw, Flodine Park, Hamilton Creek, Hamm Canyon, Island Butte, McClean, Papoose Canyon, Roadrunner, Sleeping Ute, and Towaoc fields have high potential for continued expansion of production of gas and some oil in the Paleozoic section of the Paradox Basin Province of the SJPL. The Carbonate Buildup Play and Structural and Fractured Shale Play both have high potential for oil and associated gas development in the area.

Medium potential
Only the northwestern part of the SJPL is expected to have potential for oil and hydrocarbon gas. Although the Mississippian is still lightly explored, the carbonates in the northwestern part of the SJPL are prospective, will probably be structurally controlled, and may have a high percentage of CO2 and are assigned medium resource potential.

Low potential

Generally, this includes the remaining lands within the area outside the medium-potential area that are underlain by a sedimentary section at least 1,000 feet thick. The Marginal Clastics (Silverton Delta) Play remains speculative, but there is some potential for small accumulations of conventional gas.

No currently recognizable potential

Generally, this area includes both lands located outside the Paradox Basin Province boundary and those that are not underlain by at least 1,000 feet of sedimentary rocks. Some sedimentary exposures are found outside the basin, but presumably consist of a thinner section. The plutonic rocks within the Paradox Basin Province have no currently recognizable potential.

MAJOR OIL AND GAS PLAYS

Introduction

The SJPL contains a number of important and productive oil and gas plays, many of which have been extensively explored since the last assessment of the region in the early 1990s. According to the Colorado Oil and Gas Conservation Commission database, 1,339 wells have been drilled in the SJPL planning area, with 40 percent (533) drilled after 1984. At the end of 2004, there were 502 producing wells, 339 (68 percent) of which were located in the Ignacio-Blanco coal-bed methane (CBM) field of Archuleta and La Plata counties. Of the remainder, 156 wells (31 percent) produced conventional oil and gas in Dolores, Montezuma, and San Miguel counties.

Since 1999, an average of 34 new wells have been added annually, equally split between CBM production and conventional oil and gas. In 2004, 331,000 barrels of oil and 89 billion cubic feet (BCF) of gas were produced in the SJPL planning area, excluding carbon dioxide (CO2) production. CO2 production from three wells in Montezuma County added another 321 BCF to the total gas produced in the area.

New potential plays in the SJPL that have been upgraded in their resource potential in this analysis include the Entrada Play of the Northern San Juan Basin Province, and the Structural and Fractured Shale Play and Mississippian Play in the southeastern Paradox Basin Province.

As defined here, a play is a set of oil or gas accumulations that are geologically, geographically, and temporally related and that exist by virtue of identical or similar geological conditions. The oil or gas accumulations may be known to exist or be completely hypothetical and may be discovered or undiscovered. Geological characteristics as reservoir lithology, timing and migration, trapping mechanisms and source rock, as well as maturation, are taken into consideration in the definition and evaluation of each play. Estimates of undiscovered oil and gas resources in the SJPL are derived from the 1995 and 2000 USGS National Assessment of undiscovered oil and gas resources.

The San Juan Public Lands include parts of two major oil and gas provinces, the San Juan Basin Province (Province 022 of the USGS National Assessment) in the east and the Paradox Basin Province (021) in the west. The SJPL also include the southwestern part of the lightly explored, but oil-productive, San Juan Sag. The San Juan Basin is the second-largest natural-gas field in the United States. Coal-bed methane development in the San Juan Basin Province accelerated during the late 1980s and is currently the primary focus of natural-gas development in the region. The Paradox Basin Province (Table 3.15.3) is an important oil and gas producer, and gas production, in particular, has accelerated in the last decade in the SJPL.

Table 3.15.3 - Major Oil and Gas Fields in the San Juan Basin Province in the SJPL

NAME	TYPE	PRODUCING RESERVOIRS
Ignacio-Blanco	CBM/Gas	Mesa Verde Group (Point Lookout), Dakota, Fruitland Coal
Chromo	Oil	Fractured Mancos (limited production)
Menefee Mtn.	Oil	Dakota; tests in Desert Creek, Ismay (limited production)
Gramps	Oil	Dakota and fractured Mancos (currently abandoned)
Navajo	Oil	Mesa Verde Group, Mancos, Gallup

Because the National Assessment does not provide specific data for the plays in the SJPL, the resource quantities given below are for the entire San Juan Basin and Paradox Basin provinces rather than for those portions within the SJPL. An attempt to proportionate or delineate the specific resources of the SJPL is presented where appropriate and possible.

Table 3.15.4 - Major Oil and Gas Fields in the Paradox Basin Province

NAME	TYPE	PRODUCING RESERVOIRS
Andy's Mesa	Gas/Oil	Cutler, Cutler Arkose, Honaker Trail, Ismay
Cache	Oil	Ismay
Cahone	Oil/Gas	Honaker Trail
Cocklebur Draw	Gas	Hermosa, Paradox
Double Eagle	Gas	Honaker Trail, Cutler
Flodine Park	Oil/Gas	Ismay
Hamilton Creek	Gas/Oil	Hermosa, Cutler, Honaker Trail
Hamm Canyon	Gas	Hermosa
Island Butte	Oil	Desert Creek
Lisbon Southeast	Gas/Oil	Leadville
McClean	Oil/Gas	Desert Creek
Papoose Canyon	Oil/Gas	Desert Creek, Ismay
Roadrunner	Oil/Gas	Ismay
SE Andy's Mesa	Gas/Oil	Cutler, Cutler Arkose, Honaker Trail, Ismay
Sleeping Ute	Oil/Gas	Ismay
Stone Pony	Gas/Oil	Ismay
Towaoc	Oil/Gas	Ismay

According to the 2000 USGS National Assessment, the most likely estimates of undiscovered oil and gas resources in the San Juan Basin Province are 19 million barrels of oil (MMBO) and 50 trillion cubic feet (TCF) of gas. Much of the favorable area will be gas-prone because of burial depths, source rock type, proximity to intrusive rock heat sources, or various combinations of these. Undiscovered oil resources in the Paradox Basin are larger, estimated at 500 MMBO; gas is estimated at 1.5 billion cubic feet (BCF). Most of these resources in the Paradox Basin are likely to be distributed in small- to moderate-size accumulations rather than concentrated in a few large ones.

The coal-bed methane area on the eastern side of the SJPL, in the San Juan Basin Province, likely contains the vast majority of the undiscovered gas resource. Porous carbonate plays on the western side of the SJPL, in the Paradox Basin Province, will likely account for additional undiscovered oil. New gas also will come from Paleozoic plays in the eastern Paradox Basin Province; Mississippian and Devonian rocks on the western side of the SJPL both probably have some potential, but the magnitude is uncertain due to the presence and percentage of CO2 in the natural gas and the likelihood of increased CO2 percentages in the vicinity of the Laramide-age and younger intrusives. The potential for undiscovered CO2 as opposed to natural gas in this area is uncertain.

San Juan Basin Oil and Gas Plays

Conventional oil and gas exploration and development in the San Juan Basin part of the SJPL is largely found in the Ignacio-Blanco field, which produces from the Dakota Sandstone, Fruitland Formation, Pictured Cliffs Sandstone, and the Mesa Verde Group. The field was discovered in 1950. The Dakota Sandstone, Mesa Verde Group, and Pictured Cliffs Sandstone are the principal producing horizons and typically yield dry gas with small quantities of produced water and associated hydrocarbon liquids. By 1995, the Dakota Sandstone had produced 279 BCF of gas. Production from the Dakota Sandstone reached its peak in 1996, but this formation may still have potential for limited development. The Mesa Verde Group produced 678 BCF of gas and 40,000 barrels of condensate from 1952 to 1995. Wells completed in the Pictured Cliffs Sandstone, which includes the Pictured Cliffs Sandstone and Fruitland sand, produced 88 BCF through 1995. Current production is limited to small amounts of oil. As of December 2001, 13 active conventional gas wells existed in this part of the SJPL in the Ignacio-Blanco field.

The majority of the gas produced from the SJPL, excluding CO2 production from McElmo Dome in Montezuma County, comes from the Ignacio-Blanco CBM field. In 2004, 339 wells produced 65 BCF of gas from the Fruitland coal.

Paradox Basin Province

Most of the production in the province has been from porous carbonate buildups, mainly algal mounds (porous-carbonate buildup play, USGS code 2102), around the southwestern shelf margin of the Paradox evaporite basin. The giant Aneth field, with more than 1 billion barrels of oil in place, accounts for about two-thirds of the proven resources in the province, and other fields such as the Ismay in this primarily stratigraphic play account for much of the rest. Most of the other plays have a strong structural component, particularly the Buried Fault Blocks, Older Paleozoic (2101), Fractured Interbed (2103), and Salt Anticline Flank (2105) plays. The Permian-Pennsylvanian Marginal Clastics Play (2104) is a combination of both structure and stratigraphy. The Fractured Interbed Play (2103) is an unconventional, continuous play.

The westernmost part of the SJPL lies within the southeastern part of the Paradox Basin Province. The Paradox Basin was formed in Middle Pennsylvanian time as a result of faulting along the pre-existing, northwest-trending Uncompahgre lineament, with uplift to the northeast and corresponding basin down-warping across the faults to the southwest. Salt anticlines developed in the deeper part of the basin, which has the thickest section of evaporates, as salt moved upward in response to sediment-loading from the north. The basin contains the thickest sediments along the northeastern margin, where it is bounded by the Uncompahgre uplift.

Summary of plays in Paradox Basin Province in the SJPL

The primary oil- and gas-producing formation is the Middle Pennsylvanian Paradox Formation, which consists of cyclic carbonates, clastics, and evaporates deposited in a marine environment (Scott 2003). The oldest formation with oil and gas production is the upper Mississippian Leadville Limestone. Overlying Pennsylvanian rocks include the Molas Formation and the Hermosa Group, which includes the Paradox and Honaker Trail formations. The Paradox Formation includes most of the evaporites, and the majority of the production is from the interbedded carbonates. The overlying Honaker Trail consists of marine carbonates, shales, siltstones, and sandstones. The Permian Cutler Formation consists of fluvial sandstones and shales. The Cutler Formation is the youngest interval of potential gas production within the SJPL.

The USGS 1995 National Oil and Gas Assessment project (Huffman 1995b) identified five major plays in the Paradox Basin Province that overlap with parts of the SJPL:

- Buried fault blocks, older Paleozoic (2101) – northwestern corner of SJPL;
- Salt anticline flanks (2105) – follows same boundary as Buried Fault Blocks Play;
- Fractured interbeds (2103) - follows same boundary as Buried Fault Blocks Play;
- Porous carbonate buildup (2102) - west of Lizard Head Wilderness;
- Permian-Pennsylvanian Marginal Clastics (2104) – northwest part of the SJPL adjacent to and east of the Paradox Basin boundary.

SCENARIO FOR FUTURE OIL AND GAS EXPLORATION AND DEVELOPMENT ACTIVITY

Projecting expected oil and gas activity is necessary to assess potential effects of leasing SJPL lands for oil and gas exploration and development. This part of the analysis presents the type and level of potential – activity principally based on geology and past and present activity. Economics and technology, access to an area of interest, and the availability of processing facilities and transportation also play a role in exploration and development activity levels. Some of these factors, such as economics and technology, are difficult to predict due to their complexity, interactive nature, and variability in time. This analysis is based on what is currently known about geology and activity and does not attempt projections of future fluctuations in oil and gas markets and political factors or rapid and unpredictable changes in technology or discoveries that may trigger new plays in the area.

Projected oil and gas activity may not always equate with geologic potential for the existence of hydrocarbons. In some areas where all the geologic factors indicate a high potential for oil and gas resources, other factors, such as inaccessibility, risk, high exploration costs, and low oil and gas prices, may limit the potential for exploration and development activity. Consequently, an area of high potential for hydrocarbon occurrence may have a low potential for exploration and development activities. Conversely, such factors as rapidly escalating product prices or advances in technology could lead to drilling activity in areas considered to have a low potential for oil and gas occurrence. In any case, current projections of activity are based on currently known conditions and reasonable expected changes in technology and price factors.

Based on the analysis of the geology and plays in the SJPL, and their resource potential, the parts of the SJPL that have high and moderate potential for oil and gas occurrence and development are:

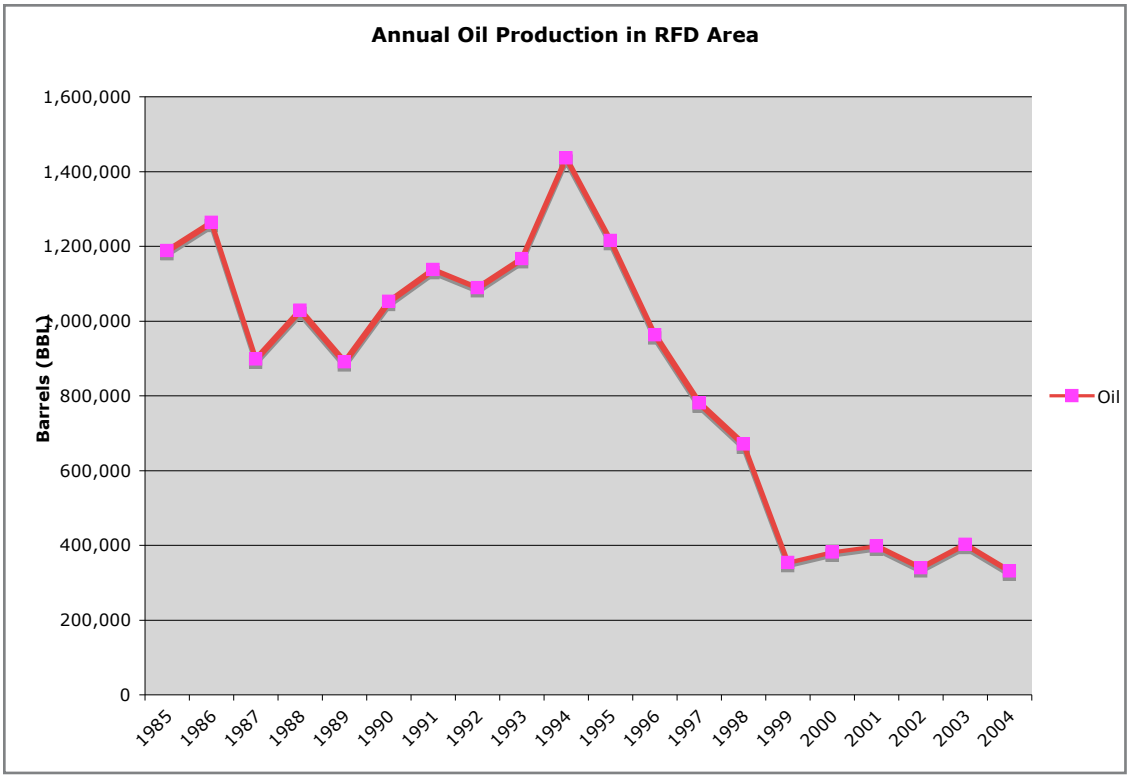
- The clastic terrane in the San Juan Basin Province, largely from source and reservoir rocks in the Cretaceous section;
- The Cretaceous and Jurassic section in the San Juan Sag; and
- The carbonate terrane in the Paradox Basin Province, largely from source and reservoir rocks in the Pennsylvanian, with lesser contributions from the Permian and Mississippian section.

Currently 528,000 acres of public land (20 percent of USFS and BLM land in the SJPL) are leased for oil and gas development.

Production from developed wells has also increased steadily, and the number of producing wells shows a constant annual increase of about 10 percent over the last six years. Based on current trends, drilling activity in the SJPL is likely to continue at a minimum of 35 new wells per year. Given the oil and gas price trends discussed above, it is possible that this drilling activity may increase to more than 140 wells per year during the first five years of the plan and approximately 60 wells per year during the subsequent 10 years of the plan on federal lands.

The recent Environmental Impact Statement for the Northern San Juan Basin Coal Bed Methane Project in La Plata and Archuleta Counties (2006) analyzed a proposal by six companies to drill approximately 300 new coal-bed methane (CBM) wells in the Northern San Juan Basin in the next five years. One hundred and thirty-eight wells are approved for drilling on federal lands and the rest of the development would occur on private and state lands. The overall life of this CBM project, including construction, production, and reclamation, would be approximately 40 years.

Figure 3.15.2 - Annual Oil Production in RFD Area

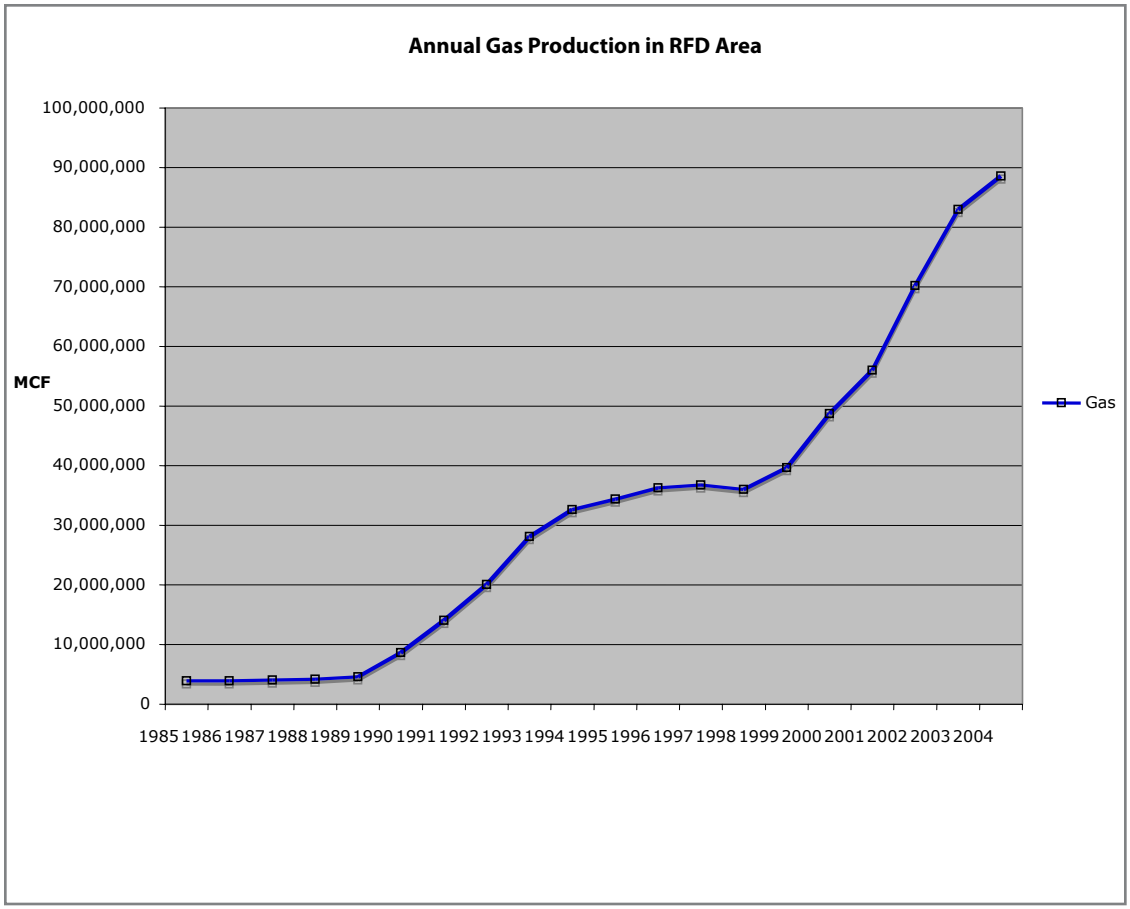


Infrastructure

With respect to the SJPL, a critical issue is how gas moves into the San Juan Basin pipeline system through the Blanco Hub. Consideration is primarily given to trunk pipelines, larger capacity lines used to transport gas or oil to market. Credible data is not available to address local gathering infrastructure. Currently the Paradox, Piceance, and Uinta basins all flow south to the Blanco Hub. There is insufficient capacity in these pipelines to accommodate the future development projected in the RFD scenario through 2020. For example, the Trans-Colorado pipeline (Table 3.15.5), a major conduit for gas from the Paradox Basin part of the SJPL, is at or near capacity. As more gathering capacity is built to feed the Blanco system, capacity constraints are likely for transmission out of the Blanco Hub. Currently, transmission capacity is very tight at the Blanco Hub, and if additional Paradox, Piceance and Uinta gas flows into the system, transmission capacity constraints could emerge.

It is projected that within the next 5-10 years that a parallel pipeline to the existing Trans-Colorado gas pipeline will be required, and that a new 50-ft right of way will be required to construct the pipeline. In the interim, Trans-Colorado Pipeline compression may be increased. Power and road capacity are sufficient to handle future development in the RFD area. Sufficient 10-inch line capacity currently exists and is projected to provide sufficient capacity to transport gas out of the Paradox Basin to the limiting Trans-Colorado Pipeline.

Figure 3.15.3 - Non CO2 Gas Production in RFD



In the HD Mountains area, a critical part of the future development of CBM, the only pipeline that is available to take gas is the Public Service of Colorado line, which is a high-pressure (900 psi) consumer line. CBM from the HD Mountains area may contribute considerably more production than is currently estimated, particularly with the potential for 80-acre down spacing. Elm Ridge Resources, a CBM producer in the HD Mountains area, is attempting to run another line south to flow gas to the Blanco Hub.

Figure 3.15.4 - Annual CO2 Production in RFD Area

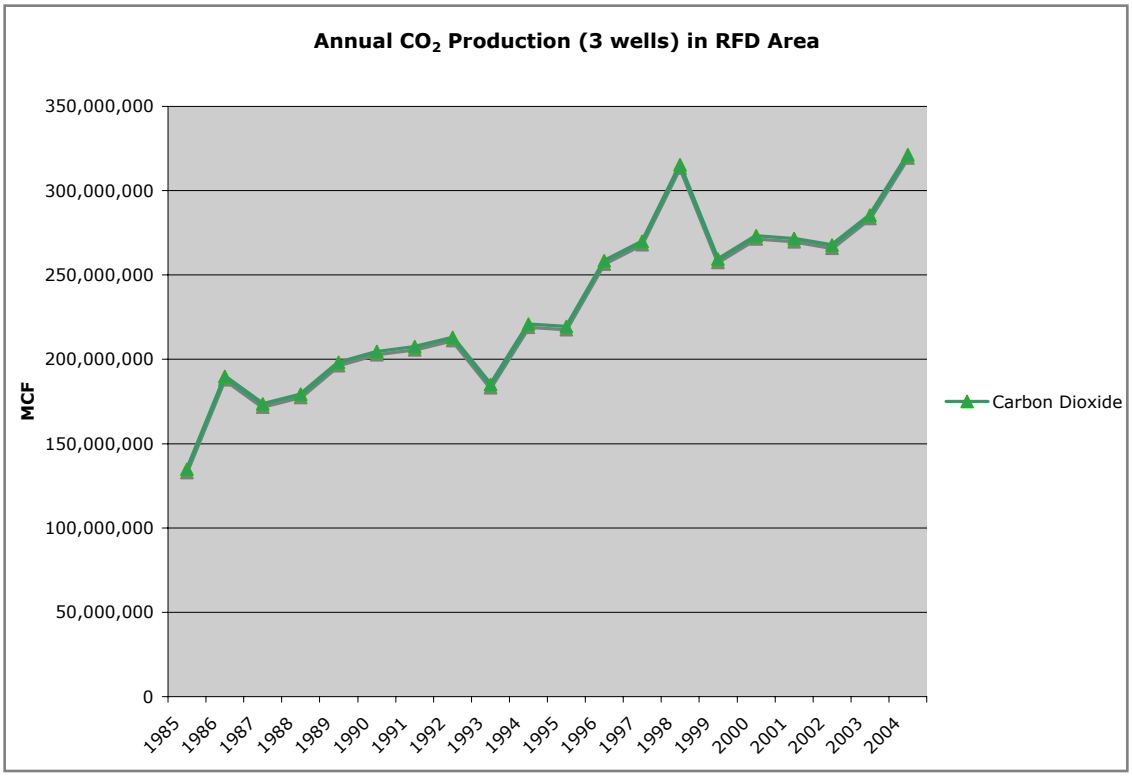


Table 3.15.5 - Major Pipelines in SJPL

NAME	OWNER	USE	SIZE (INCHES)
Basin	*	Gas	*
Mid-America	Enterprises Production	Gas	*
Public Service of Colorado	*	Gas	*
Rocky Mountain	*	Gas	4, 10
Trans-Colorado	*	Gas	22
Trans-Texas	Kinder-Morgan	CO2	*
Williams	Williams Field Services	Gas	*

In summary, although the pipeline infrastructure in the SJPL is basically in place, capacity for future gas development may be limited, particularly in the Paradox Basin Province part of the SJPL. In addition, moving gas out of the San Juan Basin may limit future development in the SJPL if new pipelines are not built to transport gas from the San Juan Basin to eastern markets. A parallel 22-inch pipeline to the existing 22-inch Trans-Colorado pipeline is projected to address Paradox Basin constraints.

Pending leases

Existing lease nominations in the eastern Paradox Basin Province and the San Juan Sag of the SJPL total approximately 230 parcels on 150,000 acres. Within these unleased lands, a total of 170 new wells are projected if the lands are leased and gas discovery in paying quantities matches potential. A proposal to drill 138 new wells over the next five years in the HD Mountain Analysis Area (federal, private, and state jurisdiction) has been approved federal jurisdiction as documented in the final Environmental Impact Statement for the Northern San Juan Basin Coal Bed Methane Project in La Plata and Archuleta Counties (2007).

Impacts of future technology

A number of conventional and experimental development technologies are being used or evaluated in and adjacent to the SJPL. These include stimulation technology, directional and horizontal drilling, multiple zone completion and other techniques. Some of the more important are discussed below.

Conventional well drilling is still common in the SJPL, where vertical wellbores are the preferred drilling and completion method for oil and gas wells. There is lower cost and risk by drilling vertically. Reserves often can be captured adequately with vertical wellbores. When pumping is required to produce the oil, maintenance costs are lower in vertical wellbores. However, directional drilling and stimulation technology are being applied more frequently in the area, particularly in the Paradox Basin Province, and these techniques are likely to continue to be used at an increasing rate. Some of the future development of new or mature plays in the Paradox Basin also may require application of some of the technologies discussed below.

Directional and horizontal drilling

Directional (purposely deviated) drilling allows producers to drill more than one well from a well location and to disturb less surface area. It also makes drilling more feasible in areas with significant environmental concerns. The cost of drilling a directional well is commonly considerably more expensive and presents additional technical and financial risks. Therefore this technology has only recently been suitable and economically viable in the SJPL.

The objectives of directional and horizontal drilling are typically related either to avoiding surface occupation or to increasing production efficiency, both of which are relevant to the SJPL, particularly in the Paradox Basin Province. These two objectives are not always compatible. Avoidance of surface occupancy is typically due to environmental concerns. In terms of economic efficiency, such wells may be less efficient due to increased cost (approximately 20 percent) and higher operating expenses with no change in producible reserves.

Single-lateral directional well drilling has been an experimental technique in the San Juan Basin in the past but has recently gained momentum as improvements are developed. Past efforts generally failed to achieve favorable economics when costs versus results were evaluated.

Horizontal drilling is possible but is not currently applied (other than experimentally) in the San Juan Basin Province due to poor cost-to-benefit ratio. If horizontal drilling should prove economically and technically feasible in the future, the next advancement in horizontal-well technology could be drilling multi-laterals or hydraulic fracturing horizontal wells. Multilaterals could be one, two or branched laterals in a single formation or single laterals in different formations. Hydraulic fracturing could be a single fracture axial with the horizontal well or multiple fractures perpendicular to the horizontal well. These techniques are currently complex and costly.

In the Paradox Basin Province, success with horizontal drilling in mature fields may increase drilling or redrilling activity because of the extra reserves captured with this new technology. In some cases this technology could utilize existing vertical wellbores (recompletions), because the operators have a clearer picture of localized geology in the producing fields. By redrilling wells with a horizontal leg, the operator can accelerate and capture more reserves than a vertical well. In the case of new development, such as the Fractured Shale Play, fewer wells would be required with horizontal wellbores. As a horizontal wellbore intersects a thousand or more feet of the producing formation versus vertical penetration, more oil or gas can be accessed and produced.

The success of horizontal drilling is dependent on the geology of the reservoir. It has not been tested in the existing oil and gas reservoirs in the Paradox Basin Province in the SJPL. Horizontal wellbores are not as conducive for pumping. Operators will have to weigh these risks prior to opting for expensive horizontal completions versus traditional vertical completions.

Multiple-zone completions/commingling

Recent advances in technology have enabled multiple-zone completions in single well bores. Multi-zone completions include: 1) individual zone treatments with significant time lag between stimulation of each zone, 2) staged, limited-interval fracture treatments accomplished in a short period of time, and 3) limited entry where one large treatment is applied to multiple zones. Multiple-zone completions are likely to be employed in the SJPL as development proceeds.

Although multi-zone completions reduce the number of well bores, problems have been identified with each type. For example, individual-zone treatments require multiple trips to a well, increasing well cost; they also cause loss of production due to extended shut-in periods. Staged-fracture treatments have a significant residence time of fluid in the formations and thus can cause formation damage. Also, a limitation exists on the number of stages that can be pumped. Limited-entry fracturing fails when formations of different reservoir characteristics are treated as a single zone. Future advances in fracture technology will focus on overcoming these limitations and should provide significant opportunities for commingling more zones in fewer well bores.

REASONABLE FORESEEABLE DEVELOPMENT IN THE SJPL

Historical development and price trends, USGS and EPCA resource estimates, current drilling and development activity, existing leases, pending wells, pending leases, and pipeline and power infrastructure were considered in formulating this analysis. The projection of drilling activity, both wildcat and development, is based primarily on the escalation of oil and gas prices that corresponds closely to the historical drilling activity and will mostly be confined to the high and moderate potential areas (Figure 3.15.1). The low potential areas may have little or no activity, and the no potential areas are forecast for no activity. Proposed wells, such as those in the HD Mountain area, were also considered.

Approximately 1,185 new wells may be drilled on all jurisdictions in the planning area and ultimately produce at least 19 MMBO and 3.25 TCF of gas, which is well below the total discovered and undiscovered resource projected by the USGS, assuming that about 10 percent of the resources for the San Juan Basin and Paradox Basin Provinces can be allocated to the SJPL. Most of this drilling would take place in the Northern San Juan Basin during the period 2009 to 2013.

It is important to note that the estimates of disturbance contain rough estimates of timing (when the disturbance will occur within the 15-year planning period), and specific locations of estimated disturbance within the provinces (without site-specific proposals for well site locations, it is not possible to identify exactly where the estimated disturbance will occur). It is reasonable to assume that most disturbance would occur at intervals throughout the planning period rather than all at once, and/or that the majority of the estimated disturbance would be within or adjacent to existing fields and mostly along existing primary road and pipeline corridors. Estimates of exploratory wells that are dry holes (occupied for 1-2 years) verses production wells (which may be occupied for 20-40 years) are provided.

Finally, it is important to note that these projections do not consider the various environmental and land-management constraints (such as special lease stipulations and Management Area direction) that may be imposed by the Preferred (Plan) Alternative and other alternatives analyzed in this EIS. The majority of projected development will be within existing leases, and hence not subject to the decisions in the Plan. Reasonably foreseeable development projections.

Based on the Resource Occurrence Potential discussed in the previous section, industry interviews and leasing trends, and the price and development trends identified above, the following RFD projections are made. These are totals within the planning area including projected development on currently leased and unleased lands.

- Coal-bed methane development in the San Juan Basin Province of the RFD area will grow at an average of 60 wells per year for a period of approximately five years at current spacing (all jurisdictions). This total of 300 CBM wells is taken from the Industry Proposed Action analyzed in the Northern Basin Environmental Impact Statement (SJPL 2007). In addition, the Fruitland Formation CBM wells could grow at an additional rate of 90 wells per year over a five-year period or a total of 450 wells north of the Ute Line if 80-acre spacing is applied (all jurisdictions). All wells drilled are projected to be production wells. This would result in an average annual production increase of 16 BCF of coal-bed methane and a total increase in annual production to 240 BCF by 2023. The projected total production of CBM over the next 15 years in the San Juan Basin Province of the RFD area is 4.58 TCF.

- Additional exploration for conventional oil and gas in the San Juan Basin Province in the RFD area will result in an average of two exploratory wells per year over the next 15 years (all jurisdictions). No specific production is projected for these wells, but exploration will occur in the Fractured Mancos, Dakota and Mesa Verde plays. Each wells lifespan from drilling to reclamation is projected to be one to two years.
- The San Juan Sag will see exploration and development activity at an average of two wells per year on National Forest lands, ultimately yielding total production of 10 MMBO and 9 BCF of gas by 2020. It is projected that one-half of these wells will be production wells with a life of 30-40 years.
- The Paradox Basin Province plays in the RFD area will grow at an average of 25 wells per year for a period of 15 years (all jurisdiction). This total includes an assumed average development of 10 wells per year (150 wells total) in the Dolores lease nomination area (National Forest), resulting in an annual production increase of 25,000 barrels of oil and 2.5 BCF of conventional gas. This development will result in a total annual production of 730,000 barrels of oil and 65 BCF by 2020. The total production during the next 15 years in the Paradox Basin Province of the RFD Area is projected to be 8.7 MMBO and 740 BCF of conventional gas. There is an approximate 80-percent success rate for wells drilled in the BLM portion of the Paradox Basin. For the purpose of projecting development on national forest lands the same 80-percent success rate is assumed. The impact associated with production wells drilled in the National Forest portion of the Paradox Basin is assumed to be 30-40 years.

In summary, this RFD scenario projects approximately 170 wells per year throughout the RFD area on all jurisdictions for the first five years and approximately 27 wells per year for the subsequent 10 years (a total of 1,185 new wells) that could ultimately produce at least 19 MMBO and 5.3 TCF of gas, which is well below the total discovered and undiscovered resource projected by the USGS (2005), assuming that about 10 percent of the resources for the San Juan Basin and Paradox Basin provinces can be allocated to the RFD area.

Well disturbance

Each LRMP/RMP alternative represents a discrete set of leasing availability decisions. The leasing decisions, in turn, affect how and to what extent oil and gas development may take place on the public lands. A reasonably foreseeable development scenario that projects future oil and gas development within the planning area is presented below. The RFD scenario represents a level of development that would be projected if unconstrained by the management alternatives in Chapter 2 and the lease stipulations presented in the Plan, Appendix H. Implementation of the RFD scenario is the basis for estimating the environmental consequences of oil and gas development over the next 10-15 years. Similarly the effects of the land management alternatives described in Chapter 2 on the RFD scenario is analyzed.

Table 3.15.6 - Reasonably Foreseeable Development Scenario for Planning Area - number of wells on all jurisdictions

LAND OWNERSHIP	PARADOX BASIN	NORTHERN SAN JUAN BASIN (REMAINDER OF 160-ACRE SPACING UNITS)	NORTHERN SAN JUAN BASIN (80-ACRE SPACING UNITS)	SAN JUAN SAG
BLM Public Lands	185	27	90	0
National Forest	140	158	110	30
State Lands	0	7	20	0
Private Lands	50	138	230	0
TOTAL	375	330	450	30

Tables 3.15.7 through 3.15.10 present the above RFD scenario statistics on USFS, BLM, and federal subsurface within the discrete RFD scenario area. Also presented is the rate of development on the public lands for the first five year and subsequent ten-year development projection. Development will be greatest in the Northern San Juan Basin, followed by the Paradox Basin. Oil and gas activity in portions of the Paradox Basin and the San Juan Sag will be exploratory.

Table 3.15.7 - Unconstrained (Baseline) Projection of Wells, Well Access Road Miles, and Corresponding Acres Disturbed on USFS Lands in Northern San Juan Basin - 2009-2024

	Existing producing wells	Existing wellsites projected to be reclaimed	Projected wells on EXISTING leases		Projected wells on FUTURE leases	
			Exploration (short-term)	Production (long-term)	Exploration (short-term)	Production (long-term)
Northern San Juan Basin – CBM	32	0	0	268	0	0
Northern San Juan Basin – Conventional	0	0	30	0	0	0
San Juan Sag	0	0	5	0	10	15
Paradox Basin	0	0	0	0	15	125
TOTAL	***32***	***0***	***35***	***268***	***25***	***140***

	Existing road miles	Existing road miles projected to be reclaimed	Projected road miles for projected wells on EXISTING leases		Projected road miles for projected wells on FUTURE leases	
			Exploration (short-term)	Production (long-term)	Exploration (short-term)	Production (long-term)
Northern San Juan Basin – CBM	16	0	0	80	0	0
Northern San Juan Basin – Conventional	0	0	0	0	0	0
San Juan Sag	0	0	2	0	5	7
Paradox Basin	0	0	0	0	5	40
TOTAL	***16***	***0***	***2***	***80***	***10***	***47***

	Existing wells and roads		Projected disturbance – EXISTING leases		Projected disturbance – FUTURE leases	
	Total acres disturbed (1.5 Ac/well + 2.4 Ac./well road)	Total acres projected to be reclaimed	Total acres disturbed – exploration wells and roads	Total acres disturbed – production wells and roads	Total acres disturbed – exploration wells and roads	Total acres disturbed – production wells and roads
Northern San Juan Basin – CBM	110	0	0	575	0	
Northern San Juan Basin – Conventional	0	0	10	0	0	
San Juan Sag	0	0	20	0	40	50
Paradox Basin	0	0	0	0	50	425
TOTAL	***110***	***0***	***30***	***575***	***90***	***475***

Table 3.15.8 - Unconstrained (Baseline) Projection of Yearly Averages of Wells and Well Access Road Miles, and Corresponding Acres Disturbed on USFS Lands in Northern San Juan Basin - 2009-2024

	Average number of wells, road miles,* and corresponding disturbance acres projected to be drilled per year on NFS lands 2009-2014	Average number of wells, road miles,* and corresponding disturbance acres projected to be drilled per year on NFS lands 2014-2024
Northern San Juan Basin – CBM	54 wells • 16 miles • 115 acres disturbed	0 wells • 0 miles • 0 acres disturbed
Northern San Juan Basin – Conventional	2 wells • 0 miles • 1 acres disturbed	2 wells • 0 miles • 1 acres disturbed
San Juan Sag	2 wells • 1 miles • 8 acres disturbed	2 wells • 1 miles • 8 acres disturbed
Paradox Basin	10 wells • 4 miles • 40 acres disturbed	10 wells • 4 miles • 40 acres disturbed
TOTAL	68 wells • 21 miles • 183 acres disturbed	14 wells • 5 miles • 43 acres disturbed

* Only roads for administrative use (closed to public) are included. Pipelines are projected to be in road right-of-ways, so road disturbance acres include pipeline disturbance.

Assumptions for surface (land and water) disturbance:

Average pad disturbance per unsuccessful exploration well = 1.5
Average road disturbance per unsuccessful exploration well = 2.4
Average pad disturbance per producing well = 1.0 Ac.
(Average accounts for post-drilling interim reclamation and accommodates all on-lease facilities.)
Average road disturbance per producing well = 2.4 Ac.

TOTAL SURFACE DISTURBANCE PER WELL = 3.9 Ac. (unsuccessful well, otherwise 3.4 acres per producing well after partial reclamation.

Assumptions for air disturbance:
See air quality section of this chapter.

Table 3.15.9 - Unconstrained (Baseline) Projection of Wells , Well Access Road Miles, and Corresponding Acres Disturbed on BLM Lands in Northern San Juan Basin - 2009-2024

	Existing producing wells	Existing wellsites projected to be reclaimed	Projected wells on EXISTING leases		Projected wells on FUTURE leases	
			Exploration (short-term)	Production (long-term)	Exploration (short-term)	Production (long-term)
Northern San Juan Basin – CBM	35	0	0	117	0	0
Northern San Juan Basin – Conventional	0	0	10	0	0	0
San Juan Sag	0	0	0	0	0	0
Paradox Basin	64	0	20	165	0	0
TOTAL	***99***	***0***	***30***	***283***	***0***	***0***

	Existing road miles	Existing road miles projected to be reclaimed	Projected road miles for projected wells on EXISTING leases		Projected road miles for projected wells on FUTURE leases	
			Exploration (short-term)	Production (long-term)	Exploration (short-term)	Production (long-term)
Northern San Juan Basin – CBM	20	0	0	15	0	0
Northern San Juan Basin – Conventional	0	0	0	0	0	0
San Juan Sag	0	0	0	0	0	0
Paradox Basin	235	0	80	80	0	0
TOTAL	***255***	***0***	***80***	***95***	***0***	***0***

	Existing wells and roads		Projected disturbance – EXISTING leases		Projected disturbance – FUTURE leases	
	Total acres disturbed (1.5 Ac/well + 2.4 Ac./well road)	Total acres projected to be reclaimed	Total acres disturbed – exploration wells and roads	Total acres disturbed – production wells and roads	Total acres disturbed – exploration wells and roads	Total acres disturbed – production wells and roads
Northern San Juan Basin – CBM	120	0	0	125	0	0
Northern San Juan Basin – Conventional	0	0	3	0	0	0
San Juan Sag	0	0	0	0	0	0
Paradox Basin	220	0	0	560	0	0
TOTAL	***340***	***0***	***20***	***685***	***0***	***0***

Table 3.15.10 – Unconstrained (Baseline) Projection of Yearly Averages of Wells, Well Access Road Miles, and Corresponding Acres Disturbed on BLM Lands in Northern San Juan Basin - 2009-2024

	Average number of wells, road miles,* and corresponding disturbance acres projected to be drilled per year on NFS lands 2009-2014	Average number of wells, road miles,* and corresponding disturbance acres projected to be drilled per year on NFS lands 2014-2024
Northern San Juan Basin – CBM	62 wells • 7 miles • 145 acres disturbed	35 wells • 17 miles • 120 acres disturbed
Northern San Juan Basin – Conventional	1 well • 0 miles • 0 acres disturbed	1 well • 0 miles • 0 acres disturbed
San Juan Sag	0 wells • 0 miles • 0 acres disturbed	0 wells • 0 miles • 0 acres disturbed
Paradox Basin	12 wells • 4 miles • 40 acres disturbed	12 wells, 4 miles • 40 acres disturbed
TOTAL	75 wells • 11 miles • 185 acres disturbed	48 wells • 21 miles • 160 acres disturbed

* Only roads for administrative use (closed to public) are included. Pipelines are projected to be in road right-of-ways, so road disturbance acres include pipeline disturbance.

Assumptions for surface (land and water) disturbance:

Average pad disturbance per unsuccessful exploration well = 1.5
Average road disturbance per unsuccessful exploration well = 2.4
Average pad disturbance per producing well = 1.0 Ac.
(Average accounts for post-drilling interim reclamation and accommodates all on-lease facilities.)
Average road disturbance per producing well = 2.4 Ac.

TOTAL SURFACE DISTURBANCE PER WELL = 3.9 Ac. (unsuccessful well, otherwise 3.4 acres per producing well after partial reclamation.

Assumptions for air disturbance:
See air quality section of this chapter.

DISCRETIONARY VERSUS NON-DISCRETIONARY DEVELOPMENT

Non-discretionary development for the purpose of this environmental consequences analysis is defined as development that would take place on currently leased lands over the next 10 years (Tables 3.15.7 and 3.15.9). These lands are held by production, meaning that current energy development on the leases holds the leases as active until production ceases. Consequently, these lands will not be available for re-leasing until current production ceases and the leases expire. The majority of projected development (the RFD scenario) will occur on these existing leases and is considered non-discretionary. The leasing decisions rendered for this LRMP/RMP revision effort will not impact the development's implementation. The areas where projected development would occur on existing leases are: the Northern San Juan Basin (385 federal wells and 350 state and private wells) and portions of the Paradox Basin (325 new federal wells and 50 private wells).

Discretionary development for the purpose of this environmental consequences analysis is defined as development that would be directly impacted by the leasing decisions made for this LRMP/RMP revision effort. Areas where the leasing decisions would directly impact the RFDS are on the National Forest portion of the Paradox Basin (140 new wells projected) and in the National Forest portion of the San Juan Sag (30 new wells projected). Thus the projected level of discretionary development (development that depends on the leasing analysis) may total 170 new wells. The non-discretionary portion of the RFD scenario may, in contrast total 1,015 new wells.

For the purpose of cumulative effects analysis, all wells projected in the RFD scenario are analyzed whether or not they represent discretionary or non-discretionary development. This total level of projected development is also analyzed in relation to current development to evaluate cumulative energy development effects within the cumulative effects area. In contrast, the discretionary level of development by definition is treated as a direct consequence of the leasing decisions associated with each alternative and is treated as such in this environmental consequences section.

IMPACTS OF THE ALTERNATIVES ON LEASING AND OIL AND GAS DEVELOPMENT OPPORTUNITIES

The San Juan National Forest and BLM San Juan Field Office propose to make certain portions of the federal mineral estate within the planning area available for fluid mineral leasing. The proposed action (and preferred alternative) is to make 1,307,000 acres of National Forest and 704,700 acres of BLM public lands available for leasing, respectively. Of that land area, 980,100 acres would be subject to a No Surface Occupancy stipulation, 351,900 acres to a Controlled Surface Use stipulation, 333,900 to timing limitations, and the remainder subject to standard lease terms. There is leasing interest in portions of the available lease areas and we project that development of federal mineral estate may take place in those areas if leased. For the purpose of oil and gas leasing analysis, there are four alternatives to the Proposed Action/Preferred Alternative (Alternative B). These alternatives, including the No Lease Alternative, are described below.

ALTERNATIVES CONSIDERED

Alternative A

Alternative A represents the continuation of current leasing decisions. Much of this direction is contained in the BLM's San Juan/San Miguel Resource Management Plan (1985) and the San Juan National Forest Land and Resource Management Plan (1983), both as amended. Applicable lease stipulations used to condition leases based on resource protection objectives are presented in EIS Volume 3, Appendix H. Existing leasing direction as represented by Alternative A (lands available for lease and applicable lease stipulations) are described in Tables 3-15.11 and 3-15-12. A total of 2,089,000 acres are available for lease of which 115,000 acres are stipulated with timing limitations, 280,000acres stipulated with controlled surface use, 40,700 acres stipulated with No Surface Occupancy, and 1,653,000 acres stipulated with standard lease terms. There are some areas which may have both timing limitation and controlled surface use stipulations applied.

Alternative B – Preferred Alternative

Alternative B is the BLM and Forest Service Preferred Alternative. A total of 2,003,000 acres would be available for lease of which 115,305 would be stipulated with timing limitations, 282,900 stipulated with controlled surface use, 980,000 acres stipulated with No Surface Occupancy, and 1292,000 acres stipulated with standard lease terms.

Most large areas (greater than 5,000 acres) that are currently unroaded, would remain so. Leases within roadless areas would be issued with No Surface Occupancy stipulations. Other areas of the planning area would be stipulated as required to protect various resource values.

Leasing recommendations associated with Alternative B are described in Tables 3-15-11 and 3-15-12.

Alternative C

A total of 1,490,000 acres are available for lease of which 589,000 would be stipulated with timing limitations, 305,000 stipulated with controlled surface use, 518,000 acres stipulated with No Surface Occupancy, and 260,000 acres stipulated with standard lease terms. Management provisions under this alternative would emphasize the undeveloped character of large blocks of contiguous land and non-motorized recreational activities to a greater degree than the other alternatives. The large contiguous blocks of roadless areas would be managed with No Surface Occupancy stipulations. Other areas of the planning area would be stipulated as required to protect various resource values. Leasing recommendations associated with Alternative C are described in Tables 3-15-11 and 3-15-12.

Alternative D

A total of 2,067,000 acres are available for lease of which 336,000, would be stipulated with timing limitations, 352,000 acres stipulated with controlled surface use, 1,044,000 acres stipulated with No Surface Occupancy, and 309,000 acres stipulated with standard lease terms. In this alternative, lease stipulations to protect sensitive resources would tend to be implemented in specific geographic areas rather than across the planning area. Leasing recommendations associated with Alternative D are described in Tables 3.15.11 and 3.15.12.

No Lease Alternative

The No Lease Alternative represents no new leasing on National Forest and on BLM public lands. This alternative is required of the Forest Service by 36 CFR 228.102. Operationally, on either jurisdiction, no lands would be administratively available for leasing during the life of the LRMP/RMP (approximately 10-15 years); either currently unleased lands or leased lands when existing leases expire (Tables 3.15.11 and 3.15.12). As a result, part of the reasonably foreseeable development scenario would not be implemented. Of the 1,185 wells projected in the RFD, 170 wells would be affected and not drilled because leases would not be issued in currently unleased areas of projected development. All other development projected in the RFD would occur on existing leases unaffected by this leasing analysis. Only when the existing leases expire would the leasing decisions made in the LRMP/RMP revisions apply. A total of 2,089,000 acres of national forest, BLM public lands and federal subsurface would not be available for lease.

Leasing Availability Decisions

Standard lease terms are incorporated into every lease and require compliance with laws and regulations to ensure protection of other energy, mineral, and surface resources, such as soil, water, vegetation, cultural, and threatened and endangered species. In addition to standard lease terms, supplemental lease stipulations may be necessary if the authority to control the activity on the lease does not already exist under laws, regulations, or orders. It is important to recognize that the authorized officer has the authority to modify the location and design of facilities and control the rate of development and timing of activities, as well as require other mitigation under Sections 2 and 6 of the standard lease terms (BLM Form 3100-11 and 43 CFR 3101.1-23). Using the Uniform Format for Oil and Gas Leasing Stipulations, March 1989, stipulations have been developed for the following categories: 1) No Surface Occupancy (NSO); 2) Timing Limitations (TL) or seasonal restrictions; and 3) Controlled Surface Use (CSU). These stipulations are presented in detail in Volume 3, Appendix H.

Table 3.15.11 - Acres Available for Leasing and Acres Not Authorized by Alternative

PLANNING UNIT	Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D	No Lease Alternative
San Juan National Forest					
Acres Withdrawn from Leasing	480,953	480,953	480,953	480,953	480,953
Acres Proposed for Withdrawal	0	67,726	532,957	0	0
Acres Administratively Not Available for Leasing	7,578	20,371	40,077	20,371	1,392,474
Acres Available for Leasing	1,384,896	1,307,377	819,440	1,372,103	0

PLANNING UNIT	Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D	No Lease Alternative
BLM Public Lands					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	55,428	64,956	78,044	64,956	503,729
Acres Available for Leasing	448,301	439,303	425,685	439,303	0

PLANNING UNIT	Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D	No Lease Alternative
Federal Subsurface					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Unavailable for Leasing	8,423	7,911	13,788	7,911	264,396
Acres Available for Leasing	255,973	256,455	250,578	256,456	0
TOTAL	***2,642,033***	***2,642,053***	***2,642,053***	***2,642,053***	***0***

The acreage of public lands available for leasing is greatest in Alternatives A and D and least in Alternatives B and C as a reflection of the goals of the two alternatives (Table 3.15.11). Differences between Alternative C the other alternative is in the amount of area recommended for wilderness – Alternative A has 533,000 acres recommended wilderness as contrasted to the other alternatives which have no more than 68,000 acres of recommended wilderness. The No Lease Alternative would have no acreage available for leasing consistent with its goals as described above.

GENERAL PURPOSE AND EFFECT OF LEASE TERMS

Oil and gas leases grant the lessee the right to extract the oil and gas resource on leased U.S. Bureau of Land Management (BLM) and National Forest lands within the SJPL. BLM is the agency that issues leases for both BLM and National Forest lands. Section 6 of the BLM standard lease form contains terms which require the lessee to conduct operations in a manner that minimizes adverse environmental impacts, and to take reasonable measures deemed necessary by the BLM (and FS, when National Forest lands are leased) to accomplish this intent. In addition to the standard lease terms, there are two further processes to assure this accomplishment: special lease stipulations, and conditions of approval. Special lease stipulations are applied at the lease issuance stage and are identified in this plan. Conditions of approval are imposed during the oil and gas permitting process, consistent with lease rights previously granted, and are not included in this plan.

Standard lease terms

All SJPL oil and gas leases are subject to standard lease terms. These are the least-restrictive terms under which an oil and gas lessee may operate. They meet Energy Policy Act direction to encourage development of federal energy resources. They require operators of oil and gas leases to minimize adverse impacts to air, water, land, visual, cultural, and biological resources and to other land uses and users, and to comply with all applicable laws, regulations and formal orders of the agency managing the leased lands. With the exceptions noted below, leases with standard lease terms allow year-round occupancy and use of leased lands. These leases provide full access and the highest potential for discovery and development of oil and gas resources. They also contain the greatest uncertainty for lease operators because some potentially restrictive conditions may not be known until a site-specific field review of the leased lands is conducted. This generally does not occur until an application for a permit to drill is submitted. Lease notices may be included to warn a potential lessee of the likelihood of such conditions, but the extent and restrictive nature of the conditions is still not known at the lease-issuance stage. Operations may be prohibited on the affected parts of the lease, or costs may substantially increase due to protective measures required to protect the resource.

Standard lease terms (regulations at 43 CFR 3101.1-2) allow the SJPL (acting through the BLM or Forest Service) to mitigate potential resource effects by moving the proposed drill site up to 200 meters, or delaying proposed operations by up to 60 days. If these provisions will not accomplish the required resource protection, special lease stipulations are necessary.

Special lease stipulations

Special lease stipulations are applied to an oil and gas lease if additional restrictions on the rights of lessees are required to protect environmental resources. Stipulations that would be applied to new oil and gas leases under the plan and their purpose and justification are described in Volume 3, Appendix H.

Guidelines for application of special lease stipulations for BLM and Forest Service lands are contained in the Uniform Format for Oil and Gas Leasing Stipulations (Rocky Mountain Regional Coordinating Committee, March 1989). In this leasing availability analysis, special lease stipulations for oil and gas operations are identified for the public lands, and the areas to which they will be applied are mapped. Stipulations will be applied to individual leases when they are offered for sale based on this analysis and the resulting oil and gas leasing availability decision. Three categories of stipulations are used for oil and gas leases on federal lands: No Surface Occupancy (NSO), Controlled Surface Use (CSU), and Timing Limitations (TL).

Restrictions on uses represented by lease stipulations and criteria for granting exceptions, modification, or waivers as addressed in this analysis and presented in the plan, also apply to other land uses and management actions. Restrictions on uses or management activities other than oil and gas would be imposed at the time of issuance of a specific permit or other type of authorization.

The stipulations and associated bases for granting exceptions, modifications, or waivers identified in the plan apply to all land uses and management actions for which the BLM has approval responsibility, not only to fluid minerals (oil and gas) development. Restrictions on these other land uses or management activities would be imposed at the time of issuance of a specific permit or other approval.

It is important to note that the following stipulations apply only to new leases (issued after adoption of the SJPL revised plan). Existing leases are subject to the stipulations attached to them under the current Resource Management Plan (BLM, 1992) or Land Management Plan (FS, 1983).

No Surface Occupancy (NSO)

Use or occupancy of the land surface for fluid mineral (oil and gas) exploration or development is prohibited to protect identified resource values. However, oil and gas under lands affected by NSO stipulation are legally available for extraction if extraction can be accomplished without occupying the surface (such as through directional drilling or draining the deposit from adjacent lands). Technological limitations and higher cost will affect the recovery of these resources, but they are available. NSO stipulations and their purpose and justification are presented in Volume 3, Appendix H. The effects of NSO leases on leasing opportunities and projected development on the San Juan Public Lands are presented below.

The NSO stipulation is intended for application only where the SJPLC determines that the standard lease terms are insufficient to provide the level of resource protection necessary to protect the public interest. An NSO stipulation is not needed if the desired level of protection can be accomplished by relocating a proposed facility or activity within the lease area or by avoiding that activity for a specified period.

Controlled Surface Use (CSU)

Use or occupancy of the land surface for fluid mineral (oil and gas) exploration or development is allowed (unless restricted by a timing limitation (TL) stipulation), but identified resource values require special operational constraints that may modify lease rights. A CSU stipulation allows the SJPLC to require that a proposed facility or activity be relocated by more than 200 meters from the proposed location if necessary to achieve the desired level of protection. CSU provides operating guidance, but does not substitute for NSO or TL stipulations. CSU allows year-round occupancy and accessibility to leased lands while providing mitigation of effects on other resources.

The CSU stipulation is intended for application where the SJPLC determines the standard lease terms are insufficient to protect the public interest, but where an NSO is deemed overly restrictive. A CSU is not needed if relocating the proposed facility or activity by up to 200 meters would provide sufficient resource protection. CSU stipulations applied to the SJPL plan alternatives and their purpose and justification are presented in Volume 3, Appendix H.

The equivalent of a CSU for BLM land uses and activities other than oil and gas development is an SSR (site-specific relocation).

Timing Limitation (TL)

Use or occupancy of the land surface for fluid mineral (oil and gas) exploration or development is prohibited during a specified period of the year. The scope of the TL stipulation goes beyond ground-disturbing activities to encompass any source of protracted or high-intensity disturbance that could interfere with normal wildlife behavior and adversely affect habitat use. The limitation is applied annually for a specified period lasting more than 60 days. The TL stipulation does not apply to the operation and maintenance of production facilities unless the analysis demonstrates the continued need for such mitigation and that less-stringent project-specific mitigation measures (such as conditions of approval) would not be sufficient. The TL allows the SJPLC to restrict exploration operations on leased lands for more than 60 days. The TL stipulation provides for partial accessibility for a portion of the year and maintains the potential for extraction of oil and gas, but may increase costs due to timing constraints (such as a short operating season).

A TL stipulation is intended for application where the SJPLC deems that standard lease terms are insufficient to protect the public interest, but where an NSO is overly restrictive. A TL is not needed if restricting the proposed operations by up to 60 days would provide sufficient resource protection. TL stipulations applied to the SJPL plan alternatives and their purpose and justification are presented in Volume 3, Appendix H.

A TL requirement may also be applied to BLM land uses and activities other than oil and gas development.

Exception, modification and waiver of stipulations

SJPL policies allow for the granting of exceptions, modifications, and waivers to stipulations on oil and gas leases, as laid out in Chapter IV, Section C.3, of BLM Handbook H 1624-1 (Planning for Fluid Mineral Resources) and Forest Service regulations at 36 CFR 228.104. That BLM handbook and Forest Service regulations provide the following definitions:

- ***Waivers*** - the mitigation measure is permanently removed from the lease. An example is removal of an NSO stipulation to protect a raptor nest in a tree when the tree falls over and can no longer be used as a nest site.
- ***Modifications*** - the mitigation measure is permanently changed on the lease. An example could be the change in the timing limitation period for the elk on critical winter range, based on new information.

- ***Exceptions*** - the mitigation measure is removed on a case-by-case basis An example is removing a timing limitation to protect big-game winter range due to warm weather allowing the elk to leave the winter range earlier than expected in the spring.

  Thus, an exception suspends the restrictions of a stipulation for a specified period of time, activity, or portion of the area where applied but remains in effect relative to other periods of time, activities, or areas where applied. A modification consists of a temporary or permanent change to a stipulation, such as a change in the areas, activities, or periods of time where applied, but does not eliminate the stipulation. A waiver permanently eliminates the restrictions of a stipulation, including all areas, activities, or periods of time to which applied.

  Section C.3 of Chapter IV of BLM Handbook H-1624-1 describes the administrative review procedures for granting a waiver, exception, or modification on BLM public lands. Regulations promulgated in 36 CFR 228.104 describe Forest Service procedures for review and granting of waiver, exception, or modification on national forest lands. After review of an operators request the authorized Forest officer may authorize the BLM to modify, waive, or grant an exception to a stipulation.

Lease Notice (LN)

In addition to standard lease terms and special lease stipulations, the SJPLC may attach a lease notice to the lease. The LN provides more detailed information concerning limitations that already exist in law, lease terms, regulation or operational orders. LN also addresses special items the lessee should consider when planning operations, but does not impose new or additional restrictions beyond those already in the standard lease terms or special lease stipulations.

Notice to Lessees (NTL)

NTL is not attached to a specific oil and gas lease. It is a written notice issued by the authorized officer, implementing regulations and operating orders and serving as instructions on specific items of importance within a specified area. The NTL does not impose new or additional restrictions on existing leases but may result in new restrictions on future leases.

ACRES STIPULATED BY ALTERNATIVE

The following table displays acres of land that are withdrawn, deferred or would be made not available for leasing. For those areas available for leasing, the following leasing stipulations would apply by alternative. The total acres include the entire federal mineral estate, whether not the federal government owns the surface. See the oil and gas alternative maps for spatial application of the leasing stipulations.

Table 3.15.12 Acres Stipulated by Alternative

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
National Forest					
Federal Mineral Acres	1,873,427	1,873,427	1,873,427	1,873,427	1,873,427
Acres Withdrawn from Leasing	480,953	480,953	480,953	480,953	480,953
Acres Proposed for Withdrawal	0	67,726	532,957	0	0
Acres Administratively Not Available for Leasing	0	20,371	20,371	20,371	1,392,474
Acres Available for Leasing	1,392,474	1,304,377	839,146	1,372,103	0
No Surface Occupancy	1,705	741,524	278,232	810,994	0
Controlled Surface Use	169,485	248,636	265,420	235,850	0
Controlled Surface Use/Timing Limitations	559	77,176	73,089	69,843	0
Timing Limitation	1,390	69,935	67,826	71,693	0
Standard Lease Terms	1,219,355	167,106	154,579	183,723	0

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
BLM Public Lands					
Federal Mineral Acres	504,259	504,259	504,259	504,259	504,259
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	55,428	64,956	78,044	64,956	504,259
Acres Available for Leasing	448,831	439,303	425,658	439,303	0
No Surface Occupancy	35,846	166,119	170,923	161,280	0
Controlled Surface Use	135,765	31,438	31,407	33,123	0
Controlled Surface Use/Timing Limitations	45,295	10,437	10,308	13,040	0
Timing Limitation	71,748	197,686	179,438	198,208	0
Standard Lease Terms	160,177	33,623	33,609	33,652	0

Table 3.15.12 Acres Stipulated by Alternative, continued

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Federal Subsurface					
Federal Mineral Acres	264,366	264,366	264,366	264,366	264,366
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	8,423	7,911	13,788	7,911	264,366
Acres Available for Leasing	255,973	256,455	250,578	256,456	0
No Surface Occupancy	3,190	72,459	68,490	71,725	0
Controlled Surface Use	65,257	23,848	23,746	23,824	
Controlled Surface Use/Timing Limitations	12,346	2,325	2,213	2,791	0
Timing Limitation	42,167	66,333	64,745	66,574	0
Standard Lease Terms	133,013	91,490	91,384	91,542	0
TOTAL	***2,642,033***	***2,642,053***	***2,642,053***	***2,642,053***	0

LRMP/RMP Alternatives A and D emphasize more area available for leasing and development with less restrictions or area allocated to recommended wilderness as compared to Alternatives B and C. Alternatives B and C use more restrictions that result in no-surface-occupancy stipulations because of the alternatives' primary emphasis on maintaining most of the large, contiguous blocks of undeveloped lands with NSO stipulations or as wilderness recommendations not available for lease. After analyzing the effects of development on surface resources, including consideration of environmentally sound drilling technology, reclamation, and effects of prohibiting surface occupancy, the Forest Service or BLM may determine that the impacts are unacceptable for some areas. These areas may be closed to leasing at the discretion of the Forest Service or BLM. The No Lease Alternative, which is analyzed by Forest Service regulation (see above), has no areas administratively available for leasing over the period of this Plan.

EFFECT OF MANAGEMENT AREAS AND RESOURCE PROTECTION MEASURES ON OIL AND GAS LEASING

Effects from various aspects of the revised management plans and associated leasing decisions are discussed in the following sections. This section outlines the methods used to determine the magnitude of the effects. The management areas and guidelines in the revised management plans were converted into stipulations that would be applied to new leases. Locations of the various resources where the stipulations would apply were mapped. Because the stipulations developed for the EIS represent the best management practices, a consistent set of stipulations was used in Alternatives A through D where specific resource and wildlife conditions occurred (e.g., steep slopes, special threatened or endangered habitat condition, etc). Alternatives A through D vary by areas allocated to various management areas and their applicable lease terms (Table 3.15.12). The No-lease alternative by objective does not contain stipulations since no leasing would take place on either National Forest and BLM administered lands.

The reasonably foreseeable development (RFD) scenario, which projects the number of wells over the next 10-15 years, was developed for areas where leasing decisions will be made. The RFD scenario projects a number of wells that may be drilled (assuming the geologic and economic assumptions come true) if there were no BLM or Forest Service limitations on drilling. The RFD scenario projections assume compliance with all other federal and state laws and regulations (e.g., Clean Air Act, Clean Water Act, state spacing regulations, etc.).

The magnitude of the effects of leasing decisions on the ability to carry out the RFD scenario is determined using a proportionate impact method. For both the Forest Service and BLM units, the number of acres of RFD area, by basin, was calculated with a constraint, either by stipulation or management area direction, put on oil and gas leasing. Based on the amount of constrained acres, the proportionate number of wells to be eliminated or affected was determined for selected portions of the RFD scenario area. The only areas where leasing decisions incorporated in this plans Record of Decision will affect the RFD's implementation are the National Forest portion of the Paradox Basin which is substantially unleased and the San Juan Sag, which is also substantially unleased. Leasing decisions made in both of these areas would directly affect the implementation of the RFD scenario. In contrast, a large portion of the RFD scenario would be carried out on existing leases in the San Juan and Paradox basins. Leasing decisions made for the LRMP and RMP revisions would therefore not affect the implementation of that portion of the RFD scenario.

Decisions to make lands not administratively available for leasing precludes the exploration and the potential discovery of oil and gas resources and can make subsurface federal mineral estates unrecoverable. If drilling and production occurs on adjacent private lands, drainage of federal reserves may occur, resulting in lost federal revenues and associated reduced returns to counties and states. The opportunity to explore and produce on adjacent leased lands may also be affected by precluding exploration and production from reservoirs under unavailable lands. Designating lands as "not administratively available" in areas where a NSO stipulation could provide the same protection may be more restrictive than necessary.

Figure 3.15.6 - Oil and Gas Leasing Stipulations Alternative A

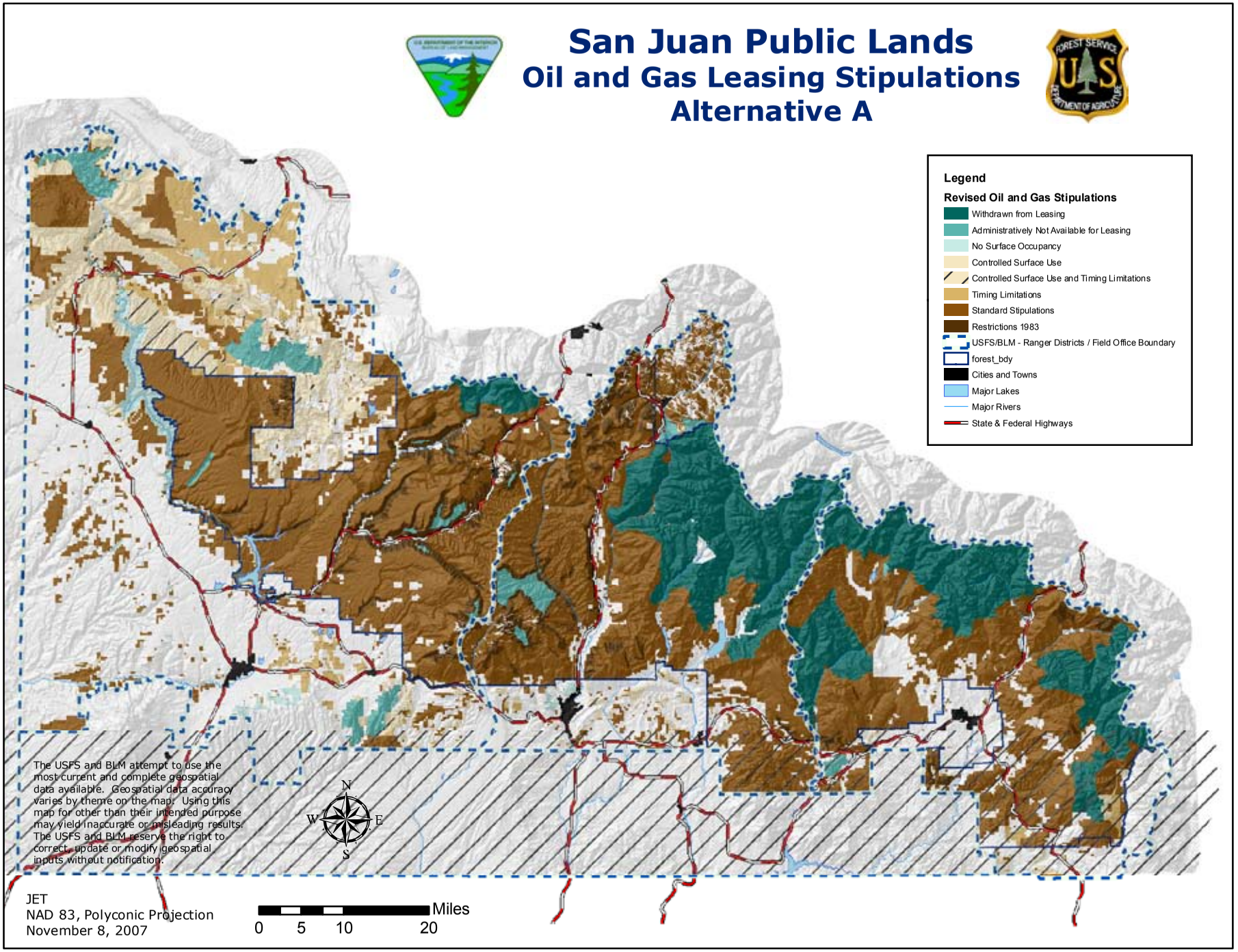


Figure 3.15.7 - Oil and Gas Leasing Stipulations Alternative B

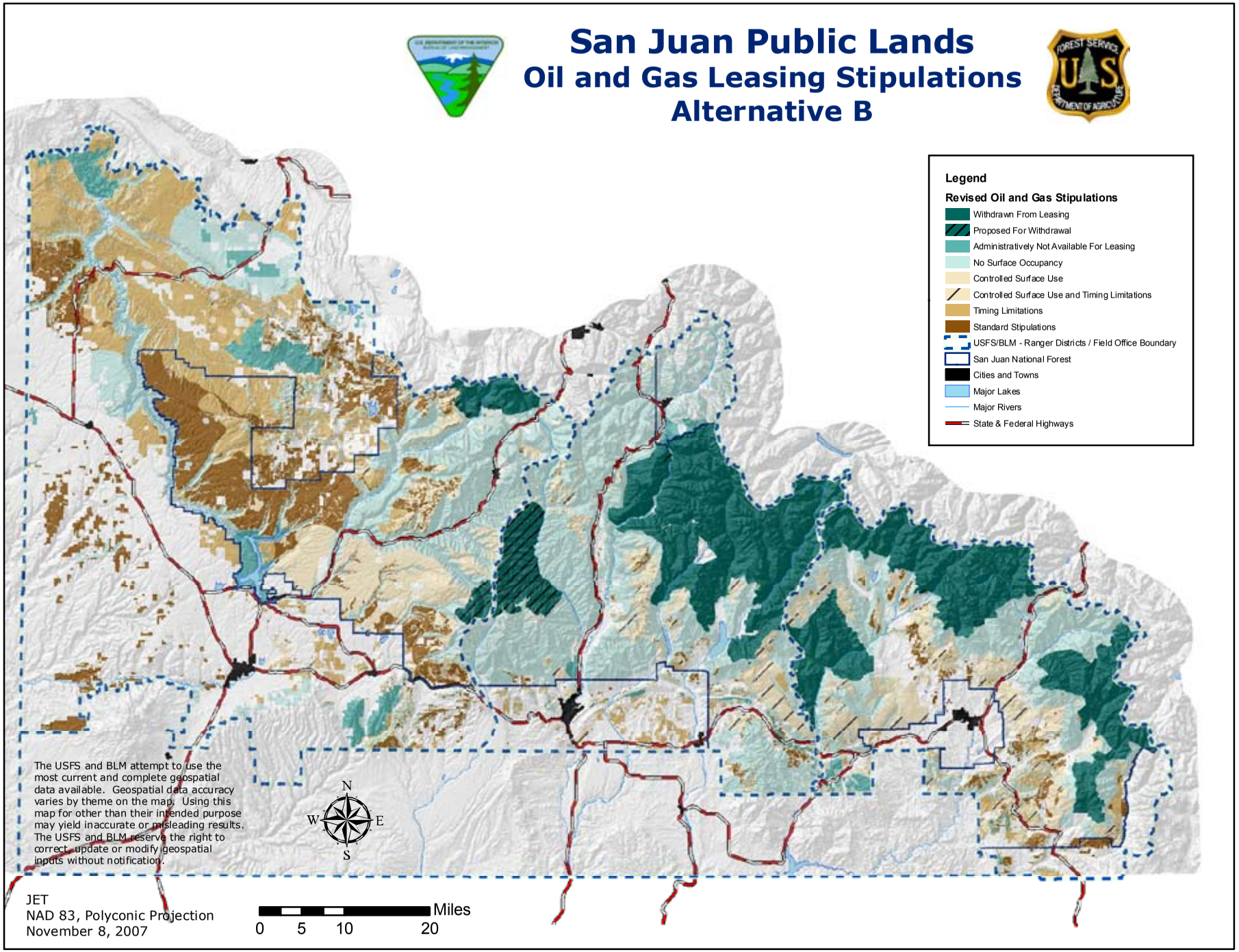


Figure 3.15.8 - Oil and Gas Leasing Stipulations Alternative C

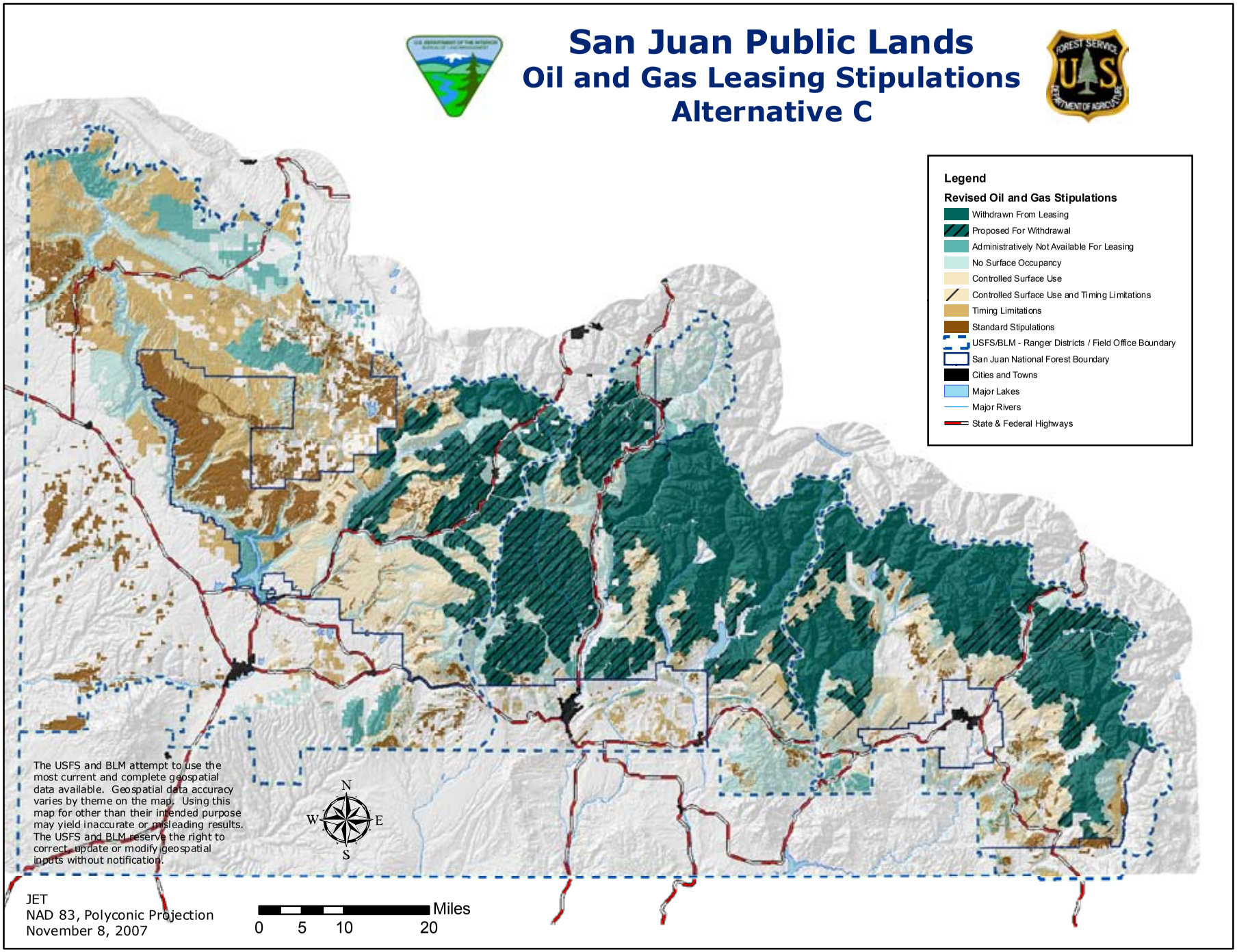


Figure 3.15.9 - Oil and Gas Leasing Stipulations Alternative D

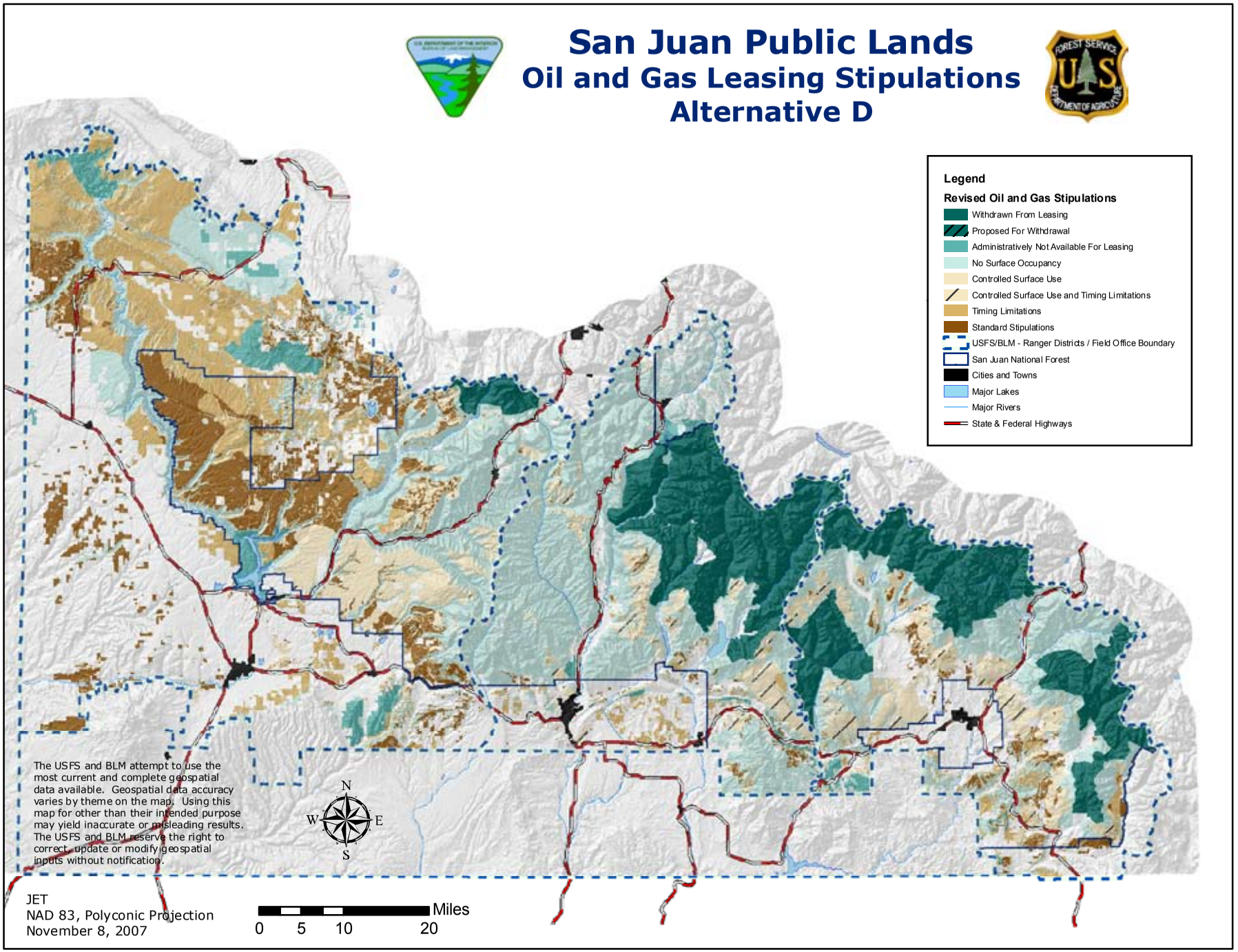


Table 3.15.12 (above) displays acres of land that would be made not available, and available for leasing. The total acres include the entire federal mineral estate whether or not the federal government owns the surface. See the oil and gas alternative maps for spatial application of the leasing stipulations.

The following table summarizes the management areas applied to each alternative and the stipulations applied to each management area. Management Area 1 and Management Area 5 are the predominant emphases applied to management of the National Forest and BLM Public lands, followed by Management Area 3. Management Areas 1 and 3 are also the most restrictive, requiring no lease or the NSO stipulation in most instances. Management Area 5 areas are the areas within which much of the RFD scenario activity would be located. Also most of the RFD scenario would occur on existing leases unaffected by the leasing-availability decisions made for the LRMP/RMP revisions. Areas where the RFD scenario would be affected by the leasing decisions, the San Juan Sag and National Forest portion of the Paradox Basin, would be allocated to Management Area 5 under most alternatives. Management Area 5 areas in addition to standard lease terms may contain CSU and TL and terms.

Table 3.15.13 Acres of Stipulations by Management Area by Alternative

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
San Juan National Forest - MA 1					
Acres Withdrawn from Leasing	480,953	480,953	480,953	480,953	480,953
Acres Proposed for Withdrawal	0	56,953	528,010	0	0
Acres Administratively Not Available for Leasing	0	0	45	116	0
NSO	0	58,089	5,180	16,376	0
CSU	533	0	0	0	0
CSU/TL	9	0	0	0	0
TL	0	0	0	0	0
Std. L only	2,456	0	0	0	0
TOTAL	483,942	595,995	1,014,188	497,445	480,953

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
San Juan National Forest - MA 2					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	5,601	22,130	22,090	7,150	7,519
NSO	1	64,581	58,099	50,517	0
TL	3	918	918	918	0
CSU	10	4,386	6,662	4,291	0
CSU/TL	4	512	2,127	509	0
Std. L only	1,899	3,422	3,710	3,422	0
TOTAL	7,519	95,950	93,609	66,807	7,519

Table 3.15.13 Acres of Stipulations by Management Area by Alternative, continued

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
San Juan National Forest - MA 3					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	17,585	3,924	3,912	12,483	637,770
NSO	489	477,201	127,728	544,709	0
TL	1,100	41,623	44,711	40,195	0
CSU/TL	539	13,548	6,821	6,200	0
CSU	119,193	33,172	24,887	23,156	0
Std. L only	498,863	21,681	32,596	21,807	0
TOTAL	637,770	591,149	240,656	648,551	637,770

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
San Juan National Forest - MA 4					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	1,504	48	48	5,544	150,922
NSO	6	75,264	50,385	76,408	0
TL	6.81	0	0	0	0
CSU	41,538	0	0	0	0
CSU/TL	0	0	0	0	0
Std. L only	107,866	0	0	0	0
TOTAL	150,922	75,312	50,433	81,952	150,922

Table 3.15.13 Acres of Stipulations by Management Area by Alternative, continued

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
San Juan National Forest - MA 5					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	304	132	73	579,258
NSO	1,209	49,824	47,543	104,452	0
TL	279	25,222	20,028	28,404	0
CSU	7,686	190,330	213,693	187,641	0
CSU/TL	7	50,131	52,657	50,007	0
Std. L only	570,076	139,249	95,812	140,485	0
TOTAL	579,258	455,061	429,866	511,061	579,258

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
San Juan National Forest - MA 7					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	1,189	1,144	1,189	0
NSO	0	10,913	4,166	10,771	0
TL	0	2,170	2,167	2,175	0
CSU	0	20,747	20,176	20,761	0
CSU/TL	0	12,985	11,483	13,128	0
Std. L only	0	2,755	2,755	2,755	0
TOTAL	0	50,761	41,892	50,780	0

Table 3.15.13 Acres of Stipulations by Management Area by Alternative, continued

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
San Juan National Forest - MA 8					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	594	594	1,440	14,520
NSO	0	8,599	2,185	15,388	0
TL	0	0	0	0	0
CSU	1,050	0	0	0	0
CSU/TL	0	0	0	0	0
Std. L only	13,470	0	0	0	0
TOTAL	14,520	9,194	2,780	16,828	14,520

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
BLM - MA 1					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	55,428	55,302	55,302	55,302	55,428
NSO	0	1,271	11,781	1,271	0
CSU	0	0	0	0	0
CSU/TL	0	0	0	0	0
TL	0	0	0	0	0
Std. L only	0	0	0	0	0
TOTAL	55,428	56,574	67,083	56,574	55,428

Table 3.15.13 Acres of Stipulations by Management Area by Alternative, continued

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
BLM - MA 2					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	876	876	876	93,368
NSO	25805	77,303	79,806	63,855	0
TL	6,089	11,762	13,708	11,762	0
CSU	5,371	3351	4,899	3,351	0
CSU/TL	6,949	3,900	3,906	3,900	0
Std. L only	49,152	175	1,562	175	0
TOTAL	93,368	97,367	104,758	83,919	93,368

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
BLM - MA 3					
Acres Withdrawn from Leasing					
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	150	3,168	150	258,564
NSO	9,030	53,218	46,918	35,369	0
TL	42,350	147,833	139,983	86,230	0
CSU/TL	29,903	1,805	1,678	927	0
CSU	100,648	19,885	19,916	14,410	0
Std. L only	76,633	13,137	24,338	7,596	0
TOTAL	258,564	236029	236,002	144,682	258,564

Table 3.15.13 Acres of Stipulations by Management Area by Alternative, continued

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
BLM - MA 4					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	0	0	0	38
NSO	38	5,868	5,868	5,868	0
TL	0	0	0	0	0
CSU	0	0	0	0	0
CSU/TL	0	0	0	0	0
Std. L only	0	0	0	0	0
TOTAL	38	5,868	5,868	5,868	38

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
BLM - MA 5					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	1,685	14,557	1,685	96,840
NSO	972	25,294	17,836	44,338	0
TL	23,309	27,960	19,856	91,755	0
CSU	29,745	3,523	1,913	9,083	0
CSU/TL	8,442	75	65	3,556	0
Std. L only	34,372	16,515	3,911	22,056	0
TOTAL	96,840	75,052	58,138	172,473	96,840

Table 3.15.13 Acres of Stipulations by Management Area by Alternative, continued

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
BLM - MA 7					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	429	429	429	0
NSO	0	8,470	7,510	9,374	0
TL	0	10,115	10,116	14,957	0
CSU	0	4,678	4,678	6,278	0
CSU/TL	0	4,657	4,657	4,657	0
Std. L only	0	3,816	3,816	3,844	0
TOTAL	0	32,166	31,207	39,540	0

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
BLM - MA 8					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	0	0	0	0
NSO	0	1,200	1,200	1,200	0
TL	0	0	0	0	0
CSU	0	0	0	0	0
CSU/TL	0	0	0	0	0
Std. L only	0	0	0	0	0
TOTAL	0	1,200	1,200	1,200	0

Table 3.15.13 Acres of Stipulations by Management Area by Alternative, continued

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Federal Subsurface - MA 1					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	2,416	0	0
Acres Administratively Not Available for Leasing	0	0	0	0	231
NSO	1	2,893	518	712	0
CSU	98	0	0	0	0
CSU/TL	39	0	0	0	0
TL	4	0	0	0	0
Std. L only	95	0	0	0	0
TOTAL	231	2,893	2,934	712	231

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Federal Subsurface - MA 2					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	135	135	1,376	1,376
NSO	0	0	0	0	0
TL	738	555	631	555	555
CSU	220	170	178	170	170
CSU/TL	214	2	47	2	2
Std. L only	1,171	79	227	79	79
TOTAL	2,380	941	1,218	2,182	2,182

Table 3.15.13 Acres of Stipulations by Management Area by Alternative, continued

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Federal Subsurface - MA 3					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	2,038	3,657	2,079	227,293
NSO	3,060	48,071	45,824	39,245	0
TL	24,513	42,277	40,724	36,130	0
CSU/TL	8,596	882	725	730	0
CSU	63,768	18,514	18,394	18,283	0
Std. L only	127,354	78,803	78,690	74,080	0
TOTAL	227,293	190,585	188,013	170,546	227,293

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Federal Subsurface - MA 4					
Acres Withdrawn from Leasing	0 0	0 0	0 0		0 0
Acres Proposed for Withdrawal	0 0	0 1,908	0 2,209	0	1,940 0
Acres Administratively Not Available for Leasing	366 2 2	0 0 0	0 0 0	0 0 1,914	0 0 0
NSO	1,570 1,940	0 1,908	0 2,208	0 0	0 1,940
TL				0 0	
CSU				1,914	
CSU/TL					
Std. L only					
TOTAL					

Table 3.15.13 Acres of Stipulations by Management Area by Alternative, continued

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Federal Subsurface - MA 3					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	2,038	3,657	2,079	227,293
NSO	3,060	48,071	45,824	39,245	0
TL	24,513	42,277	40,724	36,130	0
CSU/TL	8,596	882	725	730	0
CSU	63,768	18,514	18,394	18,283	0
Std. L only	127,354	78,803	78,690	74,080	0
TOTAL	227,293	190,585	188,013	170,546	227,293

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Federal Subsurface - MA 4					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	0	0	0	1,940
NSO	0	1,908	2,209	1,914	0
TL	366	0	0	0	0
CSU	2	0	0	0	0
CSU/TL	2	0	0	0	0
Std. L only	1,570	0	0	0	0
TOTAL	1,940	1,908	2,208	1,914	1,940

Table 3.15.13 Acres of Stipulations by Management Area by Alternative, continued

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Federal Subsurface - MA 5					
Acres Withdrawn from Leasing					
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	5,186	7,259	5,186	30,308
NSO	94	11,234	9,157	20,438	0
TL	16,543	6,629	6,629	13,006	0
CSU	1,166	621	640	822	0
CSU/TL	3,495	1,421	1,420	2,039	0
Std. L only	9,010	240	194	4,965	0
TOTAL	30,308	25,332	25,300	46,457	30,308

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Federal Subsurface - MA 7					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	405	405	405	0
NSO	0	6,152	6,152	6,095	0
TL	0	16,872	16,872	16,882	0
CSU	0	4,543	4,543	4,548	0
CSU/TL	0	20	20	20	0
Std. L only	0	12,369	12,369	12,419	0
TOTAL	0	40,361	40,361	40,371	0

Table 3.15.13 Acres of Stipulations by Management Area by Alternative, continued

PLANNING UNIT	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Federal Subsurface - MA 8					
Acres Withdrawn from Leasing	0	0	0	0	0
Acres Proposed for Withdrawal	0	0	0	0	0
Acres Administratively Not Available for Leasing	0	0	0	0	2,213
NSO	0	0	0	2,181	0
TL	0	0	0	0	0
CSU	1	0	0	0	0
CSU/TL	0	0	0	0	0
Std. L only	2,212	0	0	0	0
TOTAL	2,213	0	0	2,181	2,213

Management provisions under Alternative C would emphasize wilderness recommendations that maintain the undeveloped character of large blocks of contiguous land and non-motorized recreational activities to a greater degree than the other alternatives. The large contiguous blocks of roadless areas would be not available for leasing. Alternatives B and D would also maintain large contiguous blocks of roadless areas, Hover these roadless areas would be managed as backcountry roadless and not recommended for wilderness. An NSO stipulation would apply to these areas. As such, NSO stipulations would be applied to slightly more land area than Alternative B. Alternative A has the most area available for lease under Management Area 5 which provides for a strong multiple use emphasis. Alternative A also has the most acres available for lease using standard lease terms. This strong reliance on implementing standard lease terms is a result of Alternative A's direction to implements the leasing decisions in current land management plans. The No-leasing Alternative equates to no issuance of leases during the period of the plan and consequently no oil and gas development would occur. The objectives of the No-leasing alternative are not related to management areas and their allocations but represent over-arching prohibition on leasing regardless of management area allocation. The effects of each alternatives management area allocations on reasonably foreseeable development is presented below.

Effect of management areas on leasing and on the RFD scenario

This discussion focuses on management areas that, by their own management direction, place limits on oil and gas activities. Some management areas are proposed wilderness recommendation not available for leasing or areas not administratively available for leasing, or have guidelines more restrictive than standard lease terms. Standard lease terms apply to all leases, whether or not they have additional special stipulations. Some management areas with management direction that do not require use of an area-wide stipulation may still include leases with special stipulations designed to protect certain specified resources.

Some management areas contain provisions that require NSO stipulations over large blocks of land. The effects of these large blocks of NSO are potentially greater than spatially small areas of NSO because the interiors may be potentially inaccessible.

The following discussion describes restrictions placed on oil and gas development based on management area direction. For effects of the stipulations on the development of oil and gas resources for the protection of other resources, such as wildlife, refer to the Effects on Oil and Gas by Type of Stipulation section.

Management Area 1 - natural processes dominate – NSO or unavailable for leasing

In Management Area 1 areas, natural processes operate relatively free from the influence of humans with the existing landscape character gradually changing over time through natural processes. Resources are managed to perpetuate semi-primitive and pristine conditions. This MA includes designated wilderness, Wilderness Study Areas, Wild and Scenic river designation/eligible areas, wilderness recommendations, and other special/primitive areas. Oil and gas leasing is not authorized or no surface occupancy is prescribed where compatible with Management area 1 management. Road construction for geophysical uses is prohibited. Portable techniques must be used. The following are Management Area 1 allocations by alternative and the stipulations that apply to Management Area 1 areas.

Table 3.15.14 - Management Area 1

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
National Forest	480,953	595,988	1,014,188	497,455	480,953
Acres Withdrawn from Leasing	480,953	480,953	480,953	480,953	480,953
Acres Proposed for Withdrawal	0	56,956	528,010	0	0
Acres Administratively Not Available for Leasing	0	0	45	116	0
MA 1 (no special land designations)	NSO	NSO	NSO	NSO	Not Stipulated no Lease
CBM High Potential	0	0	60	0	0
High Potential	0	0	65	0	0
High-Moderate Potential	0	18,286	75,013	13,304	0
Moderate Potential	0	6,077	78,303	1,898	0
Low Potential	0	69,851	273,396	0	0
No Potential	0	5,166	85,400	1,134	0
Undefined Potential	0	20	240	12	0
TOTAL	0	99,401	512,477	16,349	0
MA 1 RNA (NSO)					
High Potential	0	0	0	0	0
High-Moderate Potential	0	0	0	0	0
Moderate Potential	0	0	0	0	0
Low Potential	0	15,469	20,192	0	0
No Potential	0	0	0	0	0
Undefined Potential	0	0	5	0	0
TOTAL	0	15,469	20,197	0	0
MA 1 (no special land designations)	CSU, TL, Std. Stipulation	CSU, TL, Std. Stipulation	CSU, TL, Std. Stipulation	CSU, TL, Std. Stipulation	Not Stipulated no Lease
	2,367	0	0	0	0
CBM High Potential	0	0	0	0	0
High Potential	0	0	0	0	0
High-Moderate Potential	0	0	0	0	0
Moderate Potential	454	0	0	0	0
Low Potential	0	0	0	0	0
No Potential	1,912	0	0	0	0
Undefined Potential	0	0	0	0	0
TOTAL	2,367	0	0	0	0

Table 3.15.14 - Management Area 1, continued

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
BLM Public Lands	55,427	56,573	67,083	56,573	55,427
MA 1 (no special land designations)	55,427	55,302	55,302	55,302	55,427
Administratively not Available	0	1,271	11,781	1,271	0
NSO	0	0	0	0	0
CSU	0	0	0	0	0
CSU/TL	0	0	0	0	0
TL	0	0	0	0	0
Std. L	0	1,271	11,781	1,271	0
TOTAL					
Oil and Gas Potential:					
CBM High Potential	0	0	0	0	0
High Potential	0	0	0	0	0
High-Moderate Potential	0	0	0	0	0
Moderate Potential	0	1,271	11,781	1,271	0
Low Potential	0	0	0	0	0
No Potential	0	0	0	0	0
Undefined Potential	0	25	25	25	0
TOTAL	0	1,271	11,781	1,271	0

Management of and protection of Wilderness Study Areas, recommended wilderness, wild rivers, etc. would impact oil and gas. Effects would range from increased costs of production to the loss of some rental income, and loss of oil and gas resources and associated royalties. The magnitude of the loss would depend on the resources available in the particular area.

Alternative C has the most acres allocated to the Management Area 1, followed by Alternatives B, D and A. Much of the Management Area 1 allocation is in existing wilderness which is statutorily unavailable for leasing and in recommended wilderness which has an objective among other things of withdrawal from mineral entry. Much of the land proposed for withdrawal has no to low potential for oil and gas. The allocation of Management Area 1 does not measurably affect those lands on which the RFDS is projected. All lands within Management Area 1 would not be administratively available for lease or are currently withdrawn from leasing under the No Lease Alternative.

For Alternatives A through D the assignment of portions of the BLM and National Forest lands to Management Area 1 would have a minor effect on the RFD scenario (Table 3.15.15). Of the 1,185 wells projected in the RFD scenario, approximately 1,015 would be developed on existing leases and the remainder, a projected 170 wells, would be subject to the leasing decisions made in this LRMP/RMP revision. Of the 170 projected wells on currently unleased lands, as many as 13 wells could be eliminated by the assignment of portions of the National Forest and BLM public lands to Management Area 1 as a result of wilderness recommendations. Additionally, approximately three projected wells would not be able to be drilled on site because of an NSO stipulation (Table 3.15.14). Thus, Management Area 1 allocations associated with Alternatives A through D would overall have minor effect on projected oil and gas development. The No-lease Alternative would significantly impact oil and gas development on the national forest portion of the study area. A total of 170 projected wells would be eliminated as a result of the No-lease Alternative.

Table 3.15.15 - Effects of Management Area 1 on Oil and Gas Development Based on the Reasonably Foreseeable Development Scenario as a Result of Management Area 1 Application

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
RFD Area Affected:					
Paradox Basin (NF Portion)					
NF Basin Acres	229,945	229,945	229,945	229,945	229,945
MA 1 Acres	0	0	2,215	0	0
Not Available for Lease Acres	0	0	182	0	0
NSO Stipulation Acres	0	0	2,032	0	n/a
Std, CSU or TL Stipulation Acres	229,945	229,945	227,923	229,945	n/a
San Juan Sag					
Total Acres	205,804	205,804	205,804	205,804	205,804
MA 1 Acres	13,884	34,571	88,354	27,395	13,884
Not Available for Lease Acres	13,884	14,267	88,349	13,884	13,884
NSO Stipulation Acres	0	20,304	0	13,512	n/a
Std, CSU or TL Stipulation Acres	191,920	171,233	117,450	178,409	n/a
Wells Eliminated:					
National Forest	2	2	13	2	2
BLM Public Lands	0	0	0	0	0
Wells Stipulated with NSO:					
National Forest	0	3	1	3	n/a
BLM Public Lands	0	0	0	0	n/a

Management Area 2 - Special Interest Areas

These management areas are numerous and are managed to protect or enhance areas with unusual characteristics, including areas such as research natural areas, special biological or geological areas, areas of critical environmental concern or cultural historical areas. Oil and gas leasing with surface occupancy is generally not authorized unless determined compatible with the management plan developed for the Management Area 2 area. Areas where there is compatible surface management are the HD Mountains. Areas, for example, where an NSO stipulation applies include the Research Natural Areas listed in Table 3.15.16.

Table 3.15.16 - Stipulations Within Management Area 2

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
NATIONAL FOREST					
Anasazi Archaeological District					
Acres Administratively Not Available for Lease	n/a	14,971	14,971	n/a	14983
Stipulated Acres	n/a	NSO	NSO	n/a	n/a
Low Potential	n/a	11	12	n/a	n/a
Chimney Rock					
Acres Administratively Not Available for Lease	3145 0	1569 Predominantly NSO	1569 Predominantly NSO	1569 Predominantly NSO	3145 n/a
Stipulated Acres					
CBM High Potential	0	1576	1576	1576	n/a
Moderate Potential	0	1576	1576	1576	n/a
Existing RNAs (Williams Creek and Narraguinnep)					
Acres Administratively Not Available for Lease	2456	0	0	0	2456
Stipulated Acres	0	NSO	NSO	NSO	n/a
Moderate Potential	0	2,456	2,456	2,456	n/a
Falls Creek					
Acres Administratively Not Available for Lease		1392	1392	1392	1453
Stipulated Acres	STD	NSO	NSO	NSO	n/a
Moderate Potential	757	3	3	3	n/a
No Potential	695	58	58	58	n/a
Fens (Chattanooga and Burro Bridge)					
Acres Administratively Not Available for Lease	n/a	0	0	0	348
Stipulated Acres	n/a	NSO	NSO	NSO	n/a
Low Potential	n/a	64	64	64	n/a
No Potential	n/a	284	284	284	n/a
Old Growth Areas (Smoothing Iron, Boggy)					
Acres Administratively Not Available for Lease	n/a	n/a	0	n/a	4849
Stipulated Acres	n/a	n/a	Predominantly NSO	n/a	n/a
CBM High Potential	n/a	n/a	0	n/a	n/a
Moderate Potential	n/a	n/a	0	n/a	n/a
Low Potential	n/a	n/a	4849	n/a	n/a

Table 3.15.16 - Stipulations Within Management Area 2, continued

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
NATIONAL FOREST, continued					
Proposed RNAs					
Acres Administratively Not Available for Lease	n/a	2783	2783	2783	12,559
Stipulated Acres	n/a	NSO	NSO	NSO	n/a
CBM High Potential	n/a	970	970	970	n/a
Moderate Potential	n/a	1667	1667	3	n/a
Low Potential	n/a	4,670	0	0	n/a
No Potential	n/a	2469	2460	2460	n/a
Special Botanical Areas (O'Neal Hill)					
Acres Administratively Not Available for Lease	0	0	0	0	328
Stipulated Acres	STD	NSO	NSO	NSO	n/a
Moderate Potential	328	328	328	328	n/a
Unique Landscapes (Dolores River, HDs, Rico, Silverton)					
Acres Administratively Not Available for Lease		2050	2050	2050	60,863
Stipulated Acres	STD	Predominantly NSO	Predominantly NSO	Predominantly NSO	n/a
CBM High	n/a	41,660	46,217	41,660	n/a
Moderate Potential	5	159	159	158	n/a
Low Potential	n/a	13,089	5,980	5,400	n/a
No Potential	n/a	3,905	3,904	3,905	n/a
BLM PUBLIC LANDS					
Anasazi Archaeological District					
Acres Administratively Not Available for Lease	n/a	57	57	n/a	57
Stipulated Acres	n/a	0	0	n/a	n/a
Low Potential	n/a	0	0	n/a	n/a
ACECs (Gypsum Management Area, Grassy Hills, Mud Springs, Silvey's Pocket)					
Acres Administratively Not Available for Lease	0	0	0	n/a	22,956
Stipulated Acres	Predominantly STD	NSO	NSO	n/a	n/a
High Potential	n/a	7151	21,642	n/a	n/a
No Potential	1,410	0	1,314	n/a	n/a
Falls Creek					
Acres Administratively Not Available for Lease	0	78	78	78	86
Stipulated Acres	STD	NSO	NSO	NSO	n/a
Moderate Potential	30	8	8	8	n/a
No Potential	56	0	0	0	n/a
Habitat Areas (Perins Peak, Willow Creek)					
Acres Administratively Not Available for Lease	0	876	876	876	4,190
Stipulated Acres	Predominantly NSO	Predominantly NSO	Predominantly NSO	Predominantly NSO	n/a
Moderate Potential	4,802	3,314	3,314	3,314	n/a

Table 3.15.16 - Stipulations Within Management Area 2, continued

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
BLM PUBLIC LANDS, continued					
Mesa Verde Escarpment					
Acres Administratively Not Available for Lease	n/a	0	0	n/a	7,417
Stipulated Acres	n/a	NSO	NSO	n/a	n/a
Low Potential	n/a	7231	7231	n/a	n/a
No Potential	n/a	186	186	n/a	n/a
McIntyre Canyon					
Acres Administratively Not Available for Lease	n/a	n/a	0	n/a	2947
Stipulated Acres	n/a	n/a	Predominantly NSO	n/a	n/a
High Potential	n/a	n/a	2947	n/a	n/a
Old Growth Areas (Smoothing Iron, Boggy)					
Acres Administratively Not Available for Lease	n/a	n/a	0	n/a	29
Stipulated Acres	n/a	n/a	NSO	n/a	n/a
Low Potential	n/a	n/a	29	n/a	n/a
Slick Rock Hill					
Acres Administratively Not Available for Lease	n/a	n/a	0	n/a	1945
Stipulated Acres	n/a	n/a	Predominantly STD	n/a	n/a
High Potential	n/a	n/a	1945	n/a	n/a
Unique Landscapes (Dolores River, HDs, Rico, Silverton)					
Acres Administratively Not Available for Lease	0	0	0	0	67,273
Stipulated Acres	NSO, STD	NSO	NSO	NSO	n/a
CBM High Potential	n/a	69	191	69	n/a
High Potential	15,514	17,338	17,043	17,325	n/a
Moderate Potential	19,499	17,279	6733	17,279	n/a
Low Potential	1200	274	270	132	n/a
No Potential	38,301	32,313	32,313	32,313	n/a
Spring Creek Wild Horse Herd Mgmt.					
Acres Administratively Not Available for Lease					
Stipulated Acres	Predominantly TL	Predominantly TL	Predominantly TL	Predominantly TL	15,070
High Potential	3,289	3289	3289	2,926	n/a
Moderate Potential	11,781	11,781	11,781	11,821	n/a

Most of the Management Area 2 areas on National Forest occur in areas of moderate to low potential for oil and gas occurrence. Three exceptions are the Hidden Mesas potential research natural area Chimney Rock Archaeological Area, HD Mountains and the Dolores River Canyon, which are classified as having high potential for CBM gas occurrence. Most lands available for leasing within Management Area 2 areas on National Forest are assigned NSO stipulations in Alternatives B through D and standard stipulations in Alternative A. All areas allocated to Management Area 2 in the No Lease Alternative are not available for leasing during the 10-15 year duration of the revised management plans.

On the BLM public lands, the Big Gypsum Valley and Dolores River Canyon are both classified as having high potential for conventional gas occurrence. Both areas are available for lease with NSO stipulations. The Dolores River Canyon is not suitable for surface occupancy due to its high recreational value and terrain constraints that block reasonable access. In general, however, most BLM lands allocated to Management Area 2 over the planning unit have moderate potential for oil and gas occurrence.

Management Area 2 application within the RFD area would have minor effect on reasonably foreseeable development in Alternatives A through D (Table 3.15.17). No wells would be eliminated as a result of the management area's application. Similarly, wells within lands available for lease stipulated with an NSO stipulation would total approximately 5 percent of the total wells projected within the two RFD areas affected by leasing decisions made in this LRMP/RMP revision. The CSU and timing limitation stipulation would not impact projected wells in the two RFD areas. With the No-leasing Alternative no leasing would occur on currently unleased lands and consequently no oil or gas development would occur in the management area.

Table 3.15.17 - Effects of Management Area 2 Application on Oil and Gas Development Based on the Reasonably Foreseeable Development Scenario

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Paradox Basin (NF Portion)					
NF Basin Acres	229,757	229,757	229,757	229,757	229,757
MA 2 Acres	1,975	1,971	17,384	1,971	1,975
Administratively Not Available for Lease Acres	1,971	14,857	14,857	0	1,975
NSO Stipulation Acres	0	1,982	3,681	1,971	n/a
CSU or TL Stipulation Acres	0	3	544	0	n/a
San Juan Sag					
Total Acres	205,745	205,745	205,745	205,745	205,745
MA 2 Acres	0	0	0	0	0
Administratively Not Available for Lease Acres					
NSO Stipulation Acres	0	0	0	0	n/a
CSU or TL Stipulation Acres	0	0	0	0	n/a
Wells Eliminated					
National Forest	1	9	9	0	1
BLM Public Lands	0	0	0	0	0
Wells Stipulated with NSO					
National Forest	0	1	2	1	n/a
BLM Public Lands	0	0	0	0	n/a
Wells Stipulated with CSU or TL					
National Forest	0	0	0	0	n/a
BLM Public Lands	0	0	0	0	n/a

Management Area 3 - natural landscapes with limited management

These areas are managed to emphasize the natural character of the landscape. Resource management activities may occur, but natural ecological processes and resulting patterns will predominate. Oil and gas leasing may be allowed. Controlled surface use, timing restrictions and/or no surface occupancy are employed to protect natural settings and wildlife; however, NSO is the predominant stipulation utilized for this management emphasis area. Much of the Management Area 3 is applied to roadless areas in Alternatives B and D. Roadless areas in Alternative C are allocated to Management Area 1. The application of Management Area 3 has the following effect.

Table 3.15.18 - Stipulations Within Management Area 3

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
National Forest					
Stipulations :					
Administratively Not Available for Lease Acres	17,585	3,924	3,912	12,483	637,770
NSO	489	477,201	127,728	544,709	0
TL	1,100	41,623	44,711	40,195	0
CSU/TL	539	13,548	6,821	6,200	0
CSU	119,193	33,172	24,887	23,156	0
Std. L only	498,863	21,681	32,596	21,807	0
Total	637,770	591,149	240,656	648,551	637,770
Oil and Gas Potential:					
CBM High Potential	54,408	14,668	14,612	14,662	54,408
High Potential	893	958	893	893	893
High-Moderate Potential	75,825	78,678	30,279	70,784	75,825
Moderate Potential	141,585	160,788	108,420	146,144	141,585
Low Potential	355,747	250,033	75,235	333,176	355,747
No Potential	58,280	86,024	11,217	82,892	58,280
BLM Public Lands					
Stipulations:					
Administratively Not Available for Lease Acres	0	0	0	0	258,563
NSO	9,030	53,218	46,918	35,369	0
TL	42,350	147,833	139,983	86,230	0
CSU/TL	29,903	1,805	1,678	927	0
CSU	100,648	19,885	19,916	14,410	0
Std. L only	76,633	13,137	24,338	7,596	0
Total	258,564	236,029	236,002	144,682	258,563
Oil and Gas Potential:					
High Potential	171,991	159,757	159,931	84,976	171,991
Moderate Potential	73,882	75,766	75,565	59,200	73,882
Low Potential	12,691	506	506	506	12,691

Alternative B has the most acres allocated to Management Area 3, followed by Alternatives D, A, and C. On National Forest, acreage allocated to Management Area 3 ranges from 648,000 acres in Alternative A to 241,000 acres in Alternative C. Alternative C has the fewest acres allocated to Management Area 3, because many of the roadless areas in the alternative are allocated to Management Area 1. Most of the National Forest areas allocated to Management Area 3 have moderate to low to no potential for oil and gas occurrence. On BLM lands, areas of high potential allocated to Management Area 3 are generally stipulated with timing limitations and controlled-surface-use stipulations.

Management Area 3 application within the RFD area would have moderate effect on reasonably foreseeable development (Table 3.15.19). At most, one well may be eliminated as a result of the management area's application. However, wells stipulated with an NSO stipulation would total approximately 10-15 percent of the total wells projected within the two RFD areas affected by leasing decisions made in this LRMP/RMP revision. The CSU and timing limitation stipulation would also impact 10-15 percent of projected wells in the two RFD areas. The No-action alternative would affect the projection of reasonably foreseeable development within the Paradox and Basin and San Juan Sag. As many as 70 wells would be eliminated within the management area as a result of no leasing during the plan period of 10-15 years.

Table 3.15.19 - Effects of Management Area 3 Application on Oil and Gas Development Based on the Reasonably Foreseeable Development Scenario

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Paradox Basin (NF Portion)					
NF Basin Acres	229,757	229,757	229,757	229,757	229,757
MA 3 Acres	93,885	108,247	114,502	108,247	93,885
Administratively Not Available for Lease Acres	0	0	0	0	93,885
NSO Stipulation Acres	10,293	30,557	20,459	29,687	n/a
CSU or TL Stipulation Acres	18,371	39,505	41,957	39,782	n/a
San Juan Sag					
Total Acres	205,745	205,745	205,745	205,745	205,745
MA 3 Acres	86,263	88,025	42,570	79,650	86,263
Administratively Not Available for Lease Acres	0	0	0	0	86,263
NSO Stipulation Acres	3,647	56,925	11,181	49,316	n/a
CSU or TL Stipulation Acres	2,358	18,894	19,173	18,128	n/a
Wells Eliminated					
National Forest	0	0	0	0	78
BLM Public Lands	0	0	0	0	0
Wells Stipulated with NSO					
National Forest	6	27	16	25	n/a
BLM Public Lands	0	0	0	0	n/a
Wells Stipulated with CSU or TL					
National Forest	14	27	28	27	n/a
BLM Public Lands	0	0	0	0	n/a

Management Area 4 - recreation emphasis areas

Management Area 4 lands are managed to emphasize recreation opportunities while maintaining the natural landscape. These areas are typically centered on recreational destinations, transportation corridors or bodies of water. Oil and gas leasing may be allowed but limited to protect the natural setting and recreational experience. Controlled-surface-use, timing-limitation and/or no-surface-occupancy stipulations would be used to achieve recreation area objectives.

Table 3.15.20 - Stipulations Within Management Area 4

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
National Forest					
Stipulations :					
Administratively Not Available	1,504	48	48	5,868	147,908
for Lease Acres	6	73,691	48,856	74,832	0
NSO	7	0	0	0	0
TL	41,538	0	0	0	0
CSU/TL	0	0	0	0	0
CSU	104,866	0	0	0	0
Std. L only	147,908	73,731	48,904	80,700	147,908
Total					
Oil and Gas Potential:	5,101	327	321	327	5,101
CBM High Potential	11,705	5,919	3,052	5,454	11,705
High Potential	8,718	7,756	6,816	7,756	8,718
High-Moderate Potential	99,996	41,894	25,381	49,151	99,996
Moderate Potential	22,383	17,758	13,076	17,754	22,383
Low Potential	0	77	77	77	0
No Potential					
BLM Public Lands					
	0	0	0	0	38
Stipulations:	38	5,868	5,868	5,868	0
Administratively Not Available	0	0	0	0	0
for Lease Acres	0	0	0	0	0
NSO	0	0	0	0	0
TL	0	0	0	0	0
CSU/TL	38	5,868	5,868	5,868	38
CSU					
Std. L only					
Total	38	216	216	216	38
	0	814	814	814	0
Oil and Gas Potential:	0	4,759	4,759	4,759	0
High Potential	0	77	77	77	0
Moderate Potential					
Low Potential					

Alternative A has the most acres allocated to Management Area 4, followed by Alternatives D, B and C, respectively. On National Forest, acreage allocated to Management Area 4 ranges from 148,000 acres in Alternative A to 49,000 acres in Alternative C. Most of the National Forest area allocated to Management Area 4 has low to no potential for oil and gas occurrence. On BLM public lands, area allocated to Management Area 4 ranges from 5,900 acres in Alternative D to 40 acres in Alternative A. Most of the BLM areas allocated to Management Area 4 have low to no potential for oil and gas occurrence.

Management Area 4 application within the RFD area would have minor effect on implementation of the RFD (Table 3.15.21). One well may be eliminated as a result of the management area's application. Additionally, wells stipulated with an NSO stipulation would total approximately 3 percent of the total wells projected within the two RFD areas affected by leasing decisions made in this LRPM/RMP revision. The No-action alternative would affect the projection of reasonably foreseeable development within the Paradox and Basin and San Juan Sag. As many as 70 wells would be eliminated within the management area as a result of no leasing during the plan period of 10-15 years.

Table 3.15.21 - Effects of Management Area 4 Application on Oil and Gas Development Based on the Reasonably Foreseeable Development Scenario

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Paradox Basin (NF Portion)					
NF Basin Acres	229,945	229,945	229,945	229,945	229,945
MA 3 Acres	12,619	6,415	6,201	11,929	12,619
Administratively Not Available for Lease Acres	0	43	43	5,545	12,619
NSO Stipulation Acres	0	6,372	6,157	6,384	n/a
CSU or TL Stipulation Acres	5,914	0	0	0	n/a
San Juan Sag					
Total Acres	205,804	205,804	205,804	205,804	205,804
MA 3 Acres	13,018	6,700	4,136	6,233	13,018
Administratively Not Available for Lease Acres	0	0	0	0	13,018
NSO Stipulation Acres	0	6,700	4,136	6,233	n/a
CSU or TL Stipulation Acres	722.83	0	0	0	n/a
Wells Eliminated					
National Forest	0	0	0	3	14
BLM Public Lands	0	0	0	0	0
Wells Stipulated with NSO					
National Forest	0	5	5	5	n/a
BLM Public Lands	0	0	0	0	n/a
Wells Stipulated with CSU or TL					
National Forest	5	0	0	0	n/a
BLM Public Lands	0	0	0	0	n/a

Management Area 5 – active management

Management Area 5 lands are managed with a strong multiple-use emphasis on various resource objectives. These areas are often characterized by a substantially modified natural environment and include areas that currently can and potentially provide a broad range of multiple uses including oil and gas development. The stipulations applied to Management Area 5 areas would be a function of the underlying resource conditions within the area (for example, steep slopes, wildlife constraints, soil constraint, etc) and not a function of the Management Area 5 application. Management Area 5 has no stipulation constraints but would ordinarily be stipulated with standard stipulations. Consequently, the statistics presented below reflect the application of resource constraints.

Table 3.15.22 - Stipulations Within Management Area 5

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
National Forest					
Stipulations :					
Administratively Not Available for Lease Acres	0	0	0	0	579,258
NSO	1,209	49,548	47,675	104,525	0
TL	15	25,222	20,028	28,404	0
CSU/TL	7,686	190,330	213,693	187,641	0
CSU	27	50,131	52,657	50,007	0
Std. L only	570,076	139,249	95,812	140,485	0
Total	579,258	455,061	429,866	511,061	579,061
Oil and Gas Potential:					
CBM High Potential	9,180	1,824	1,824	1,830	9,180
High Potential	2,954	2,889	2,889	2,954	2,954
High-Moderate Potential	60,008	36,671	37,207	43,260	60,008
Moderate Potential	228,881	171,747	158,131	192,236	228,881
Low Potential	202,562	199,318	187,725	220,873	202,562
No Potential	75,673	42,612	42,090	49,808	75,673
BLM Public Lands					
Stipulations:				1,685	
Administratively Not Available	0	1,685	14,557	44,338	96,814
for Lease Acres	972	25,294	17,836	91,755	0
NSO	23,309	27,960	19,856	9,083	0
TL	29,745	3,523	1,913	3,556	0
CSU/TL	8,442	75	65	22,056	0
CSU	34,372	16,515	3,911	172,473	0
Std. L only	96,840	75,052	58,138		172,473
Total				148,884	
Oil and Gas Potential:	63,917	68,068	51,154	23,175	63,917
High Potential	31,462	6,616	6,616	81	31,462
Moderate Potential	1,696	81	0	81	1,696
Low Potential	1,696	81	0	376	1,696
Undefined Potential					

Much of the RFD development would occur in areas stipulated as Management Area 5 – active management. Alternative D allocates the most area to Management Area 5, followed by Alternatives A, B, and C, respectively. On National Forest, acreage allocated to Management Area 5 ranges from 580,000 acres in Alternative A to 430,000 acres in Alternative C. A substantive amount of the National Forest area allocated to Management Area 5 has high to moderate potential for oil and gas occurrence. On BLM public lands, the area allocated to Management Area 5 ranges from 221,000 acres in Alternative D to 84,000 acres in Alternative C. Most of the BLM area allocated to Management Area 5 has moderate to high potential for oil and gas occurrence.

Under Alternatives A through D, Management Area 5 application within the RFD area would have no effect on implementation of the RFD (Table 3.15.23). No wells would be eliminated as a result of the management area's application. Areas within Management Area 5 areas may be stipulated with an NSO stipulation, but that would be as a result of resource and/or wildlife constraints within the areas. The No-leasing alternative applied to areas allocated to Management Area 5 would result in elimination of approximately 70 wells projected in currently unleased lands where leasing, exploration and development are expected.

Table 3.15.23 - Effects of Management Area 5 Application on Oil and Gas Development Based on the Reasonably Foreseeable Development Scenario

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Paradox Basin (NF Portion)					
NF Basin Acres	229,945	229,945	229,945	229,945	229,945
MA 3 Acres	100,240	107,467	88,984	107,500	100,240
Administratively Not Available for Lease Acres	0	0	0	65	100,240
NSO Stipulation Acres	1,208	5,888	5,020	5,778	n/a
CSU or TL Stipulation Acres	879	32,971	29,426	32,973	n/a
San Juan Sag					
Total Acres	205,804	205,804	205,804	205,804	205,804
MA 3 Acres	81,819	44,763	45,331	51,759	81,819
Administratively Not Available for Lease Acres	0	48	48	48	81,819
NSO Stipulation Acres	0	3,988	3,996	10,984	n/a
CSU or TL Stipulation Acres	6,644	32,121	32,623	32,121	n/a
Wells Eliminated					
National Forest	0	0	0	0	73
BLM Public Lands	0	0	0	0	0
Wells Stipulated with NSO					
National Forest	1	5	5	5	n/a
BLM Public Lands	0	0	0	0	n/a
Wells Stipulated with CSU or TL					
National Forest	2	25	23	24	n/a
BLM Public Lands	0	0	0	0	n/a

Management Area 7 – residential-forest intermix

Management Area 7 lands are public lands intermingled with private lands to such an extent that management objectives for public lands are generally secondary to community or landowner uses and objectives. Energy and mineral production including oil and gas leasing is allowed but limited to protect the natural setting and public health/safety through controlled surface use, timing restrictions, and/or no surface occupancy.

Table 3.15.24 - Stipulations Within Management Area 7

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
National Forest					
Stipulations :					
Administratively Not Available for Lease Acres	0	442	395	441	0
NSO	0	10,913	4,011	10,771	0
TL	0	2,170	2,167	2,175	0
CSU/TL	0	20,747	20,176	20,761	0
CSU	0	12,985	11,486	13,128	0
Std. L only	0	2,755	2,755	2,755	0
Total	0	56,940	40,990	50,031	0
Oil and Gas Potential:					
CBM High Potential	0	4594	38	4594	0
High Potential	0	12,454	9406	12,454	0
High-Moderate Potential	0	38,302	31,023	31,329	0
Moderate Potential	0	809	0	900	0
Low Potential	0	781	523	754	0
No Potential					
BLM Public Lands					
Stipulations:					
Administratively Not Available for Lease Acres	0	430	430	430	0
NSO	0	8,446	7,487	8,444	0
TL	0	10,115	10,415	14,983	0
CSU/TL	0	4,506	4,533	6,105	0
CSU	0	4,657	4,655	4,655	0
Std. L only	0	3,815	3,815	3,843	0
Total	0	31,969	31,335	38,460	0
Oil and Gas Potential:					
CBM High Potential	0	960	838	960	0
Moderate Potential	0	1,981	8,983	8,476	0
Low Potential	0	20,685	13,360	20,682	0
No Potential	0	60	59	59	0
Undefined Potential	0	8,283	8,095	8,283	0

Some portion of the RFD development would occur in areas allocated to Management Area 7 – residential-forest intermix generally within the south end of the San Juan Sag. Alternative D allocates the most area to Management Area 7, followed by Alternatives B, C, and A, respectively. On National Forest, acreage allocated to Management Area 7 ranges from 54,900 acres in Alternative D to zero acres in Alternative A and the No-lease Alternaive. A substantial amount of the National Forest area allocated to Management Area 7 has high to moderate potential for oil and gas occurrence. On BLM public lands, the area allocated to Management Area 7 ranges from 84,500 acres in Alternative D to zero acres in Alternative A. Most of the BLM area allocated to Management Area 7 has moderate to high potential for oil and gas occurrence.

Management Area 7 application within the RFD area would have minor effect on implementation of the RFD scenario (Table 3.15.25). No wells would be eliminated as a result of the management area's application. Wells stipulated with an NSO stipulation would total approximately 2 percent of the total wells projected within the two RFD areas affected by leasing decisions made in this LRPM/RMP revision. There would be no wells stipulated with either a CSU or TL in the two RFD areas.

Table 3.15.25 - Effects of Management Area 7 Application on Oil and Gas Development Based on the Reasonably Foreseeable Development Scenario

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Paradox Basin (NF Portion)					
NF Basin Acres	229,757	229,757	229,757	229,757	229,757
MA 3 Acres	0	0	0	0	0
Administratively Not Available for Lease Acres	0	0	0	0	0
NSO Stipulation Acres	0	0	0	0	n/a
CSU or TL Stipulation Acres	0	0	0	0	n/a
San Juan Sag					
Total Acres	205,745	205,745	205,745	205,745	205,745
MA 3 Acres	0	15,854	12,806	15,854	0
Administratively Not Available for Lease Acres	0	0	0	0	0 n/a
NSO Stipulation Acres	0	3670	622	963	
CSU or TL Stipulation Acres	0	2536	2536	3068	n/a
Wells Eliminated					
National Forest	0	0	0	0	0
BLM Public Lands	0	0	0	0	0
Wells Stipulated with NSO					
National Forest	0	2	1	1	0
BLM Public Lands	0	0	0	0	0
Wells Stipulated with CSU or TL					
National Forest	0	3	3	4	0
BLM Public Lands	0	0	0	0	0

Management Area 8 - permanently developed areas

Management Area 8 areas are generally small in scale, and are permanently altered by human activities. Examples of permanently developed sites include highly developed and concentrated recreation complexes such as ski areas, utility corridors, mining sites or districts, oil and gas fields and administrative sites. Energy and mineral production including oil and gas leasing is allowed but limited to protect the developed area through no surface occupancy. Associated lease stipulations are predominantly NSO.

Table 3.15.26 - Stipulations Within Management Area 8

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
National Forest					
Stipulations :					
Administratively Not Available for Lease Acres	0	594	594	1,440	14,520
NSO	0	8,599	2,185	15,388	n/a
TL	0	0	0	0	n/a
CSU/TL	1,050	0	0	0	n/a
CSU	0	0	0	0	n/a
Std. L only	13,470	0	0	0	n/a
Total	14,520	9,194	2,750	16,828	14,520
Oil and Gas Potential:					
High-Moderate Potential	7,421	2,174	0	3,551	7,421
Low Potential	6,826	6,734	2,454	12,900	6,826
No Potential	297	296	296	296	297
BLM Public Lands					
Stipulations:					
Administratively Not Available for Lease Acres	0	0	0	0	0
NSO	0	1,200	1,200	1,200	n/a
TL	0	0	0	0	n/a
CSU/TL	0	0	0	0	n/a
CSU	0	0	0	0	n/a
Std. L only	0	0	0	0	n/a
Total	0	1,200	1,200	1,200	1,200
Oil and Gas Potential:	0	0	0	0	0
Moderate-High Potential	0	1,200	1,200	1,200	0
No Potential					

Some portion of the RFD development would occur in areas stipulated as Management Area 8 – permanently developed areas. Alternative A allocates the most area to Management Area 8, followed by Alternatives D, B and C, respectively. On National Forest, acreage allocated to Management Area 8 ranges from 20,000 acres in Alternative A to 2,200 acres in Alternative C. A substantive amount of the National Forest area allocated to Management Area 8 has moderate potential for oil and gas occurrence. On BLM public lands, the area allocated to Management Area 8 ranges from 2,200 acres in Alternative A to 1,250 acres in Alternatives B, C and D. Most of the BLM area allocated to Management Area 8 has moderate to high potential for oil and gas occurrence. Management Area 8 application within the RFD area would have minor effect on implementation of the RFD (Table 3.15.27). No wells would be eliminated as a result of the management area's application. Wells stipulated with an NSO stipulation would total approximately 1 percent of the total wells projected within the two RFD areas affected by leasing decisions made in this LRPM/RMP revision. There would be no wells stipulated with either a CSU or TL in the two RFD areas.

Table 3.15.27 - Effects of Management Area 8 Application on Oil and Gas Development Based on the Reasonably Foreseeable Development Scenario

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Paradox Basin (NF Portion)					
NF Basin Acres	229,757	229,757	229,757	229,757	229,757
MA 3 Acres	1,328	1,459	62	1,459	1,378
Administratively Not Available for Lease Acres	0	0	0	0	1,378
NSO Stipulation Acres	41	1,458	62	1,459	n/a
CSU or TL Stipulation Acres	285	1	0	0	n/a
San Juan Sag					
Total Acres	205,745	205,745	205,745	205,745	205,745
MA 3 Acres	9,649	2,183	0	3,562	9,649
Administratively Not Available for Lease Acres	0	0	0	0	9,649
NSO Stipulation Acres	0	1,925	0	3,562	n/a
CSU or TL Stipulation Acres	0	257	0	0	n/a
Wells Eliminated					
National Forest	0	0	0	0	2
BLM Public Lands	0	0	0	0	0
Wells Stipulated with NSO					
National Forest	0	1	0	1	n/a
BLM Public Lands	0	0	0	0	n/a
Wells Stipulated with CSU or TL					
National Forest	0	0	0	0	n/a
BLM Public Lands	0	0	0	0	n/a

EFFECTS OF MAJOR RESOURCE PROGRAMS ON RFD

This section discusses how oil and gas leasing and development is affected by the proposed land use plan management guidelines and associated stipulations developed for other resources. Stipulations in addition to a standard stipulation are to be part of a lease only when the environmental and planning record demonstrates the necessity for the stipulations. Land use plans serve as the primary vehicle for determining the necessity for lease stipulations (BLM Manual 1624). Stipulations that would be applied to new oil and gas leases issued during implementation of the revised land and resource management plans were developed based on environmental protection objectives, to achieve compatibility with other management objectives, resources and activities.

In the following tables, the acres shown with the various stipulations include the entire federal mineral estate exclusive of areas withdrawn from mineral leasing. The complete set of stipulations and their purpose and justification are presented in detail in Volume 3, Appendix H.

Effects from air

None of the management objectives or guidelines developed for air quality requires oil and gas stipulations. Mineral development and operations do generate emissions; however, these are regulated by the states and no further standards and guidelines are required. The Four Corners Air Quality Task Force is establishing small engine and compressor emissions limits that will apply to all jurisdictions including National Forest and BLM public lands.

Effects from fire and fuels management

Heavy equipment use during fire-suppression activities could affect buried pipelines; however, this is addressed in standard operating procedures and best management practices incorporated in the revised management plans by reference. No stipulations are required.

Effects from fish and wildlife management

The following table describes the application of NSO and dates of the TL stipulations and the acreages affected under each alternative. Reference also the discussion below for effects on projected oil and gas development from these two types of stipulations. Briefly, TLs restrict drilling activities during critical periods, such as breeding and nesting periods, and usually extend over a specific distance from the site if activities could cause an adverse effect. NSO stipulations buffer areas such as nest and breeding sites from oil and gas activities. Normally, timing limitations apply to drilling, testing, and new-construction phase of oil and gas development and not to operation and maintenance of production facilities. The objective is generally to prevent nest abandonment and reduced reproductive success. The effect will be that workover operations will have to be conducted outside the period of timing limitation. This does not apply to emergency repairs.

The CSU stipulation usually restricts drilling and other activities within a specified distance from the area requiring protection and is applied if activities would likely result in degradation of habitat, abandonment, disruption, or other failure (see the following table for the species and acreages affected by this stipulation).

Table 3.15.28 - Acres with Stipulations for Wildlife Species

SPECIES STIPULATED	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Mexican Spotted Owl (species not identified on the San Juan Public Lands) (protected activity centers (NSO) TL - 4/1 to 8/31 w/in ½ of known nests	not mapped not mapped	not mapped not mapped	not mapped not mapped	not mapped not mapped	n/a n/a
Lynx CSU – landscape linkage areas CSU - denning and winter foraging habitat	0 0	5,606 95,302	4,720 90,526	4,695 92,411	n/a n/a
Uncompahgre Fritillary Butterfly NSO – known suitable habitat	not mapped	not mapped	not mapped	not mapped	n/a
Gunnison Sage Grouse NSO – within 0.6 miles of known lek site NSO– nesting habitat within 0.6 mi. to 4.0 mi. of lek site TL - winter habitat	0 0 330	280 67,757	196 53,522	280 69,061	n/a n/a
Bald Eagle NSO – within ¼ mile of nest or winter roost site TL - 11/15 to July 31 w/in ½ mile of nest	3,710 4,113	547 249	547 250	547 249	n/a n/a
Peregrine Falcon NSO – within ½-mile radius of cliff nesting complex	3,018	6,551	6,551	7,568	n/a
Big Game Winter Habitat TL - big game winter habitat	123,767	10,059	10,059	10,906	n/a
Pronghorn Antelope TL – fawning area 5/1 to 7/15	not mapped	not mapped	not mapped	not mapped	n/a
Mule Deer TL – Calving areas 4/15 to June 30 TL – Winter range 12/1 to 4/30	0	22,308	22,280	26,289	n/a
Elk TL – Calving areas 4/15 to June 30 Tl - Production areas TL –Winter range 12/1 to 4/30	4,839 0 0	674 69,304 279,798	674 70,068 257,344	674 69,815 279,411	n/a n/a n/a
Bighorn Sheep TL – Production areas, 3/15 to 5/31 TL - Lambing areas 2/1 to 6/30 TL – Overall range 12/15 to 4/30	0 2,680	11 0 4,247	12 0 4,246	11 0 4,246	n/a n/a n/a
Goshawk NSO – within 30 acres of known occupied and alternate nests TL – No surface use is allowed 4/15 to 8/15 within ½ mile of a known occupied and alternate nest site	not mapped not mapped	not mapped not mapped	not mapped not mapped	not mapped not mapped	n/a n/a
Raptors (osprey) NSO - to protect raptor nests TL – 2/1 to 8/15 within ¼ mile of nest sites	79 122	0 49	0 49	0 49	n/a n/a

Table 3.15.28 - Acres with Stipulations for Wildlife Species, continued

SPECIES STIPULATED	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Bats NSO – within ¼ mile of known maternity roosts	not mapped	not mapped	not mapped	not mapped	n/a
Colorado River Cutthroat Trout NSO – within one-quarter mile of known pure populations	not mapped	not mapped	not mapped	not mapped	n/a
Wild Horse Herd Foaling Area	not mapped	not mapped	not mapped	not mapped	n/a

The effects of wildlife stipulations on oil and gas leasing and potential development in the RFD area would be minor. There would be approximately two wells stipulated as NSO in the San Juan Sag as a result of the wildlife stipulations in Alternatives B, C, and D, and no wells stipulated as NSO as a result of Alternative A. There would be approximately 40 wells stipulated with TLs and CSU stipulations in the National Forest portion of the Paradox Basin and the San Juan Sag as a result of Alternatives B, C, and D, and four wells stipulated as a result of Alternative A. The TL restrictions would limit the time period in which well drilling and workovers could be completed as described in Table 3.15.28 above. The No-lease Alternative makes all lands that are not withdrawn, administratively not available for lease. Therefore, none of the above stipulations apply.

Table 3.15.29 - Effects of Fish and Wildlife Management on Oil and Gas Development Based on the Reasonably Foreseeable Development Scenario

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
RFD Area Affected					
Paradox Basin (NF Portion)					
Total Acres	229,945	229,945	229,945	229,945	229,945
Wildlife Stipulation Acres	4,500	56,400	55,800	56,200	n/a
NSO Stipulation Acres	0	200	200	200	n/a
CSU or TL Stipulation Acres	4,500	56,300	55,600	56,000	n/a
San Juan Sag					
Total Acres	205,804	205,804	205,804	205,804	205,945
Wildlife Stipulation Acres	6,800	42,600	35,654	35,600	n/a
NSO Stipulation Acres	0	1,700	1,688	1,700	n/a
CSU or TL Stipulation Acres	6,800	41,000	33,966	33,900	n/a
Wells Eliminated					
National Forest	0	0	0	0	n/a
BLM Public Lands	0	0	0	0	n/a
Wells Stipulated with NSO					
National Forest	0	2	2	2	n/a
BLM Public Lands	0	0	0	0	n/a
Wells Stipulated with CSU or TL					
National Forest	4	39	39	39	n/a
BLM Public Lands	0	0	0	0	n/a

Effects from heritage resource management

An NSO stipulation is applied to the Chimney Rock Archaeological Area, national scenic trails, national historic trails, national recreation trails, cultural areas designated as special interest areas, and existing National Register districts because these features and their use and management would be incompatible with oil and gas development within their immediate bounds.

Table 3.15.30 - Acreage with Heritage Resource Stipulations by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Heritage Districts (NSO)	n/a	4700	4700	4700	n/a
Heritage Areas (NSO)	n/a	5900	5900	5900	n/a
National Historic Trails (NSO) Stipulation	na	4900	4900	4900	n/a
Glade Lake Site (NSO)	na	300	300	300	n/a
Bull Canyon (NSO)	0	20	20	20	n/a
Horse Range Mesa Paleo Site (NSO)	na	70	70	70	n/a
Grandview (CSU)	0	40	40	40	n/a
Indian Henry's Cabin (NSO)	0	10	10	10	n/a
Mesa Verde Escarpment (NSO)	0	7400	7400	0	n/a
Sam's World / Mud Springs (NSO)	0	1200	0	0	n/a
To Protect Archaeological Values	600	500	500	500	n/a

The effects of heritage management stipulations on oil and gas leasing and potential development in the RFD area would be minor. There would be no wells stipulated as NSO, CSU or timing limitations in the San Juan Sag or National Forest portion of the Paradox Basin as a result of the heritage management stipulations in all four of the alternatives. The No-lease Alternative makes all lands that are not withdrawn, administratively not available for lease resulting in elimination of the oil and gas development projected in the reasonably foreseeable development scenario. By definition the stipulations described above would not be applied in the No-lease Alternative.

Table 3.15.31 - Effects of Heritage Resource Management on Oil and Gas Development Based on the Reasonably Foreseeable Development Scenario

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
RFD Area Affected					
Paradox Basin (NF portion)					
Total Acres	229,945	229,945	229,945	229,945	229,945
Heritage Stipulation Acres	0	300	300	300	n/a
NSO Stipulation Acres	0	300	300	300	n/a
CSU or TL Stipulation Acres	0	0	0	0	n/a
San Juan Sag					
Total Acres	205,804	205,804	205,804	205,804	
Heritage Stipulation Acres	0	0	0	0	n/a
NSO Stipulation Acres	0	0	0	0	n/a
CSU or TL Stipulation Acres	0	0	0	0	n/a
Wells Eliminated	0	0	0	0	n/a
National Forest					
BLM Public Lands					
Wells Stipulated with NSO	0	0	0	0	n/a
National Forest	0	0	0	0	n/a
BLM Public Lands					

Effects from range management and livestock-grazing

Guidelines for range management and livestock-grazing do not require any stipulations for oil and gas activities. Occupancy and use for minerals purposes are not restricted by range and livestock management activities. Certain grazing activities, such as grazing on mineral sites that are being reclaimed, are addressed in site-specific management requirements at the application for permit to drill (APD) stage of development.

Effects from vegetation management

An NSO stipulation is applied to old-growth forests, proposed special botanical areas and existing and proposed research natural areas for the purpose of protecting those rare or unique vegetation types or structural representations. A CSU stipulation is applied to areas of known mapped invasive-species infestations for the purpose of alerting lessees to that condition and the need to address it in surface-use plans of operation.

Table 3.15.32 - Acreage with Vegetation Stipulations by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Old-Growth Stands (NSO), Ponderosa Pine, Warm-Dry Mixed Conifer, and Pinyon-Juniper	0	3,300	2,800	3,300	n/a
Special Botanical Areas (NSO)	0	300	300	300	n/a
Existing and Proposed Research Natural Areas (NSO)	0	11,600	7,000	5,300	n/a
Invasive Species (CSU)	0	11,000	8,700	11,100	n/a

The effects of vegetation stipulations on oil and gas leasing and potential development in the RFD area would be minor. There would be approximately two wells stipulated as NSO in the San Juan Sag as a result of the vegetation stipulations in Alternatives B, C, and D, and no wells stipulated as NSO as a result of Alternative A. By definition the stipulations described above would not be applied in the No-lease Alternative.

Table 3.15.33 - Effects of Vegetation Management on Oil and Gas Development Based on the Reasonably Foreseeable Development Scenario

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
RFD Area Affected					
Paradox Basin (NF Portion)					
Total Acres	229,945	229,945	229,945	229,945	229,945
Vegetation Stipulation Acres	0	5,900	4,700	5,900	n/a
NSO Stipulation Acres	0	2,600	2,200	2,600	n/a
CSU or TL Stipulation Acres	0	3,200	2,500	3,200	n/a
San Juan Sag					
Total Acres	205,804	205,804	205,804	205,804	205,804
Vegetation Stipulation Acres	0	800	800	800	n/a
NSO Stipulation Acres	0	300	300	300	n/a
CSU or TL Stipulation Acres	0	500	500	500	n/a
Wells Eliminated					
National Forest	0	0	0	0	n/a
BLM Public Lands	0	0	0	0	n/a
Wells Stipulated with NSO					
National Forest	0	1	1	1	n/a
Wells Stipulated with CSU	0	2	1	1	n/a

Effects from recreation management and use

Several no-surface-occupancy stipulations are applied to areas with objectives for scenic integrity protection and areas where well development would be incompatible with developed recreation-site use, such as ski areas and developed recreation sites. Table 3.15.34 presents the areas stipulated and the acreage stipulated for recreation purposes by alternative.

Table 3.15.34 - Acres with Stipulations for Recreation by Alternative

SPECIES STIPULATED	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Ski Area NSO – within ski area boundary	0	21,900	4,400	21,900	n/a
Developed Recreation Sites NSO within ¼ mile of developed site	0	6,300	6,300	6,300	n/a
Administrative Sites NSO within ¼ mile of site	0	600	600	600	n/a
Dolores River Canyon NSO	0	33,800	23,000	33,800	n/a
National Recreation Trails and the Colorado Trail NSO – ¼ mile either side of designated trail	0	2,600	6,700	7,300	n/a
Recreation-Emphasis Corridors (Management Area 4) NSO – ¼ mile of major recreation corridors	0	25,400	25,600	24,900	n/a
Designated Structured Recreation Management Area CSU	0	130,500	128,500	130,400	n/a
San Juan Skyway NSO within 1/3 mile of skyway corridor north of Durango	0	12,200	12,200	12,200	n/a
To Protect Recreational and Visual Values of the Dolores River Canyon, and Menefee and Weber Mountains NSO	27,700	1,100	1,000	1,100	n/a

Table 3.15.35 presents the effects that recreation NSO stipulations have on implementation of the RFD scenario. Effects are generally the same by alternative; no projected wells would be eliminated by application of the NSO stipulations. Wells stipulated by NSO would approximately total four, meaning the well location would have to be moved to accommodate the recreational use protected. In some instances, wells would have to be moved up to ¼ mile. In other instances, such as with stipulations applied to the Dolores River Canyon, wells would not be permitted within the Canyon proper. This stipulation's effect may be to preclude leasing of tracts within the Canyon or to displace development to the Canyon's rim. There are currently no expressions of interest in leasing within the Dolores River Canyon and the canyon has been previously stipulated as NSO.

Table 3.15.35 - Effects of Recreation Management on Oil and Gas Development Based on the Reasonably Foreseeable Development Scenario

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
RFD Area Affected					
Paradox Basin (NF portion)					
Total Acres	229,945	229,945	229,945	229,945	229,945
Recreation Stipulation Acres	1,411	20,000	18,100	19,100	n/a
NSO Stipulation Acres	1,411	4,200	4,200	4,200	n/a
CSU or TL Stipulation Acres	0	15,800	14,000	14,900	n/a
San Juan Sag					
Total Acres	205,804	205,804	205,804	205,804	205,804
Recreation Stipulation Acres	0	19,300	19,600	19,000	n/a
NSO Stipulation Acres	0	2,400	2,700	2,100	n/a
CSU or TL Stipulation Acres	0	16,900	16,900	16,900	n/a
Wells Eliminated					
National Forest	0	0	0	0	n/a
BLM Public Lands	0	0	0	0	n/a
Wells Stipulated with NSO					
National Forest	0	3	3	3	n/a
BLM Public Lands	0	0	0	0	n/a
Wells Stipulated with CSU or TL					
National Forest	0	12	11	10	n/a
BLM Public Lands	0	0	0	0	n/a

Effects from scenery management
A number of stipulations were developed to meet guidelines for scenery management, including:

- High scenic-integrity objective (VRM Class I and II) (NSO) stipulation
- Moderate scenic-integrity objective (VRM Class III) (CSU) stipulation
- Dolores River Canyon (NSO) stipulation
- Special designation trails (NSO) stipulation
- Recreation-emphasis corridors (NSO or CSU) stipulation
- Scenic byways (NSO) stipulation

The NSO stipulations apply to areas with high scenic-integrity objectives including scenic and recreation corridors. The CSU stipulation applies to areas with a moderate scenic-integrity objective. Additional NSO stipulations apply to areas listed above for the purpose of maintaining scenic integrity. The CSU stipulation allows surface occupancy and use subject to operational constraints consistent with the desired landscape character. Access and other development- and production-related facilities would be allowed but may be moved or modified to preserve scenic resources. Operational constraints may include utilizing topographic and vegetative screening, matching color tones of facilities with surrounding topographic features, orienting the well pad and facilities, redesigning production facilities to such scale that they may not be evident or blend with the vernacular architecture of the area, or placing facilities outside the affected area. Delays and mitigation could increase operator costs. The areas affected by alternative and scenic integrity objectives are shown in the following table.

Table 3.15.36 - Acreage with Scenic Integrity Stipulation by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
National Scenic Trails (NSO) Stipulation	0	400	400	400	n/a
Chimney Rock Viewshed (CSU) Stipulation	0	1,800	1,800	1,800	n/a
High Scenic-Integrity Objective and Level II Visual Resource Foreground Management Area NSO within mapped foreground areas	0	45,700	77,900	70,900	n/a
Moderate Scenic-Integrity Objective and Level III Visual Resource Foreground Management Area CSU within mapped foreground areas	0	63,000	90,100	47,100	n/a
To Protect Scenic Values and Resources (NSO) Stipulation	9,300	1,600	1,600	2,400	n/a

Table 3.15.37 presents the effects that visual-quality NSO and CSU stipulations have on implementation of the RFD scenario. Effects are generally the same by alternative; no projected wells would be eliminated by application of the NSO stipulations. Wells stipulated by NSO and CSU would total two and zero wells respectively. Where wells are stipulated as NSO, the well location would have to be moved to accommodate the visual quality of the area to be protected. In some instances, wells would have to be moved up to one-quarter mile. In the Dolores River Canyon, wells would not be permitted within the canyon proper. This stipulation's effect may be to preclude leasing of tracts within the canyon or to displace development to the canyon's rim. There are currently no expressions of interest in leasing within the Dolores River Canyon and the canyon has been previously stipulated as NSO. The objective of the No-lease Alternative is to make all lands that are not withdrawn, administratively not available for lease. This would result in elimination of all oil and gas development on unleased lands projected in the reasonably foreseeable development scenario. By definition the stipulations described above would not be applied in the No-lease Alternative.

Table 3.15.37 - Effects of Scenery Management on Oil and Gas Development Based on the Reasonably Foreseeable Development Scenario

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Paradox Basin (NF Portion)					
Total Acres	229,945	229,945	229,945	229,945	229,945
Scenery Management	8	3,700	9,700	4,400	n/a
Stipulation Acres					
NSO Stipulation Acres	8	2,500	5,300	4,400	n/a
CSU or TL Stipulation Acres	0	1,200	4,400	0	n/a
San Juan Sag					
Total Acres	205,804	205,804	205,804	205,804	205,804
Scenery Management	0	23,400	28,900	27,500	n/a
Stipulation Acres					
NSO Stipulation Acres	0	2,400	14,600	13,600	n/a
CSU or TL Stipulation Acres	0	20,900	14,300	13,900	n/a
Wells Eliminated					
National Forest	0	0	0	0	n/a
BLM Public Lands	0	0	0	0	n/a
Wells Stipulated with NSO					
National Forest	1	2	5	5	n/a
BLM Public Lands	0	0	0	0	n/a
Wells Stipulated with CSU or TL					
National Forest	0	4	5	2	n/a
BLM Public Lands	0	0	0	0	n/a

Effects from soils management

An NSO stipulation is applied to steep slopes over 40 percent and to ecological land units listed below that have steep slopes and soil characteristics that are of high risk for mass waiting due to disturbance. In addition, the Gypsum Valley Management Area is stipulated as NSO to protect highly erodible soils.

The effect of soil/geology protection stipulations on oil and gas development would be moderate. Approximately 16 projected wells would be stipulated as NSO. That is approximately 10 percent of the wells projected in the RFD for the National Forest portion of the Paradox Basin and the San Juan Sag. An additional seven wells would be stipulated CSU for soil/geology protection (Table 3.15.39). Most of the steep-slope stipulation acres are in areas outside of the RFD area. By contrast, the RFD area has about 10 percent of the land area that would require application of an NSO stipulation for steep-slope conditions.

Table 3.15.38 - Acreage with Soils Stipulations by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Slopes Greater than or Equal to 40% NSO	0	149,900	142,800 0 75,800	144,800 0 81,600	 n/a n/a
Slopes Greater than or Equal to 40% CSU	245,900	0	20,000 600 10,800	20,200 3,800 10,800	n/a
Slopes of 25% to 40% (CSU)	0	80,500			
Ecological Land Units 254, 386, 606, 720, 926, 20511D, 30506D, 34301D, 34306D, 34506D, 50803D, 50806D, 70806D, 70807D, 74803D, 80604D, 80803D, 80804D (NSO)	0	22,200			n/a n/a n/a
Gypsum Soils (CSU)	0	600			
Fruitland Formation at Outcrop Zone and 1½ mile Basinward (NL) - Other horizons (e.g., Mesa Verde) available	0	10,800			

Table 3.15.39 - Effects of Soil Management on Oil and Gas Development Based on the Reasonably Foreseeable Development Scenario

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
RFD Area Affected					
Paradox Basin (NF Portion)					
Total Acres	229,945	229,945	229,945	229,945	229,945
Soil Management	32,000	33,500	32,500	33,400	n/a
Stipulation Acres					
NSO Stipulation Acres	0	20,500	19,700	20,400	n/a
CSU or TL Stipulation Acres	32,000	13,000	12,800	13,000	n/a
San Juan Sag					
Total Acres	205,804	205,804	205,804	205,804	205,804
Soil Management	2,700	26,300	23,400	23,500	n/a
Stipulation Acres					
NSO Stipulation Acres	0	18,100	15,200	15,300	n/a
CSU or TL Stipulation Acres	2,700	7,200	7,200	7,200	n/a
Wells Eliminated				0	
National Forest	0	0	0	0	n/a
BLM Public Lands	0	0	0		n/a
Wells Stipulated with NSO					
National Forest	0	16	16	16	n/a
BLM Public Lands	0	0	0	0	n/a
Wells Stipulated with CSU or TL					
National Forest	0	7	7	7	n/a
BLM Public Lands	0	0	0	0	n/a

Effects from special use management

Generally no stipulations are required by guidelines for special uses. However, certain mineral-related activities (roads, pipelines, gathering lines, power lines) may require special use permits and will be affected by guidelines for special uses. Guidelines applied to special use activities associated with oil and gas could increase operator costs. One category, administrative sites, is analyzed in this section. Administrative sites total 600 acres and would be assigned an NSO stipulation within an area inclusive of one-quarter mile of the administrative site. Application of this stipulation would not affect oil and gas development. There is sufficient flexibility in field siting of oil and gas facilities that administrative sites would not be affected.

Effects from water management

An NSO stipulation is developed to meet guidelines for water, wetlands, riparian, and floodplain areas. The NSO stipulation is applied to maintain water quality, hydrologic integrity, and riparian area and wetland composition, structure, and function. (See the Revised Management Plans, Appendix H, Oil and Gas Stipulations). Access and other development- and production-related facilities would be allowed subject to identified operational constraints. Refer to the table below for acreages where the stipulation would be applied. Areas adjacent to reservoirs and eligible Wild and Scenic river segments would be stipulated NSO.

Table 3.15.40 - Acreage with a Water Management Stipulation by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Reservoirs Greater than 100 acres within ¼ mile of reservoir NSO	0	4,000	4,000	4,000	n/a
Eligible Wild and Scenic River Segments NSO / CSU	0	58,700	42,000	68,600	n/a
Known Wetland and Riparian Areas CSU	15,800	2,700	2,700	2,700	n/a
Wetlands, Floodplains, Riparian Areas, Water Influence Zones and Fens (NSO)	0	17,100	16,500	17,000	n/a

The effect of water management on oil and gas development would be minor to moderate. Approximately four projected wells would be stipulated with NSO. That is approximately 2 percent of the wells projected in the RFD for the National Forest portion of the Paradox Basin and the San Juan Sag. An additional seven wells would be stipulated CSU for watershed protection (Table 3.15.41).

Table 3.15.41 - Effects of Water Management on Oil and Gas Development Based on the Reasonably Foreseeable Development Scenario

JURISDICTION	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
RFD Area Affected					
Paradox Basin (NF Portion)					
Total Acres	229,945	229,945	229,945	229,945	229,945
Water Management Stipulation Acres	2	7,600	7,600	7,600	n/a
NSO Stipulation Acres	0	7,600	7,600	7,600	n/a
CSU or TL Stipulation Acres	2	0	0	0	n/a
San Juan Sag					
Total Acres	205,804	205,804	205,804	205,804	205,804
Water Management Stipulation Acres	0	7,800	4,100	7,700	n/a
NSO Stipulation Acres	0	7,800	4,100	7,700	n/a
CSU or TL Stipulation Acres	0	0	0	0	n/a
Wells Eliminated					
National Forest	0	0	0	0	n/a
BLM Public Lands	0	0	0	0	n/a
Wells Stipulated with NSO					
National Forest	0	6	6	6	n/a
BLM Public Lands	0	0	0	0	n/a
Wells Stipulated with CSU or TL					
National Forest	0	0	0	0	n/a
BLM Public Lands	0	0	0	0	n/a

Effect of NSO stipulations on RFD projection

The following discussion primarily focuses on the differences between the alternatives in terms of how the amount of acres under NSO affects the oil and gas resource. Although acres where a CSU would be applied vary by alternative, a CSU stipulation permits year-round occupancy on leased lands, offers access, and maintains the potential for discovery and development of oil and gas resources. Timing stipulations allow drilling at certain times of the year and thus maintain the potential for discovery and development of oil and gas resources.

In addition to the amount of acres stipulated, the shape of an area with an NSO stipulation affects the ability to access the subsurface resource from adjacent lands. In Alternatives B and C, areas assigned an NSO stipulation generally tend to be large blocks, whereas in Alternatives A and D, areas with NSO tend to be smaller units. Refer to the oil and gas alternative maps for further illustration.

Wells that would not be able to be drilled with surface occupancy on leased lands were identified for each alternative (see the following table).

"Affected" is defined as those wells that were projected in the RFD that are subject to the leasing decisions made in this LRMP/RMP revision. For each of the wells that would be displaced, the cost of drilling is greater, and the optimum location for best recovery of the resource may not be realized. The effects may be considerable.

Decisions to not lease lands and stipulations applied by the various alternatives could affect well locations and could, in some cases, eliminate wells, resulting in only a portion of the RFD scenario's implementation. The analysis of the effects of the stipulations applied to the RFD area suggests that approximately 13 wells would be eliminated in Alternative C and approximately four wells in the other alternatives as a result of a not-available-for-lease decision. The use of an NSO stipulation would more heavily impact the RFD projection. The 170 projected wells that would be drilled in the National Forest portion of the Paradox Basin and within the San Juan Sag would be directly influenced by leasing decisions made for this LRMP/RMP revision. Of that total, a high of 65 wells in Alternative C and a low of nine wells in Alternative A would be stipulated by an NSO (Table 3.15.42). The differences between the alternatives are primarily a function of the number of acres within each alternative that emphasize the undeveloped character of large blocks of contiguous land and non-motorized recreational activities. Alternative C provides that emphasis to a larger degree than the other alternatives. In contrast, Alternative A (current management) has the least amount of acres allocated to stipulations other than standard stipulations and least amount of acres stipulated NSO.

Projected development activity levels may not change across alternatives as a result of the number of NSO areas and their acreage (Table 3.15.42 above); however, the amount of NSO acres by alternative suggests that Alternative A presents the greatest opportunity for oil and gas development, followed by Alternatives C, B and D. It is assumed that if a no-surface-occupancy lease is purchased, then the lessee would pursue development. However, if the NSO areas are large, operators may choose to nominate only portions of the NSO areas for lease. In such case, there would be fewer wells drilled in those NSO areas with potential for oil and gas development. Table 3.15.43 presents a summary of the NSO stipulations that apply to the San Juan Public Lands and their acreage.

Table 3.15.42 - Effects of Alternatives on Oil and Gas Development as a Result of Not Available and NSO Stipulations - Based on the Reasonably Foreseeable Development Scenario

	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Total Wells Projected (RFDS) Currently Unleased lands	170	170	170	170	170
Wells Eliminated	3	12	22	5	170
Wells Stipulated by NSO - National Forest and BLM Public Lands	7	56	39	41	n/a

Table 3.15.43 - NSO Stipulations by Acres

SPECIES STIPULATED	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Mexican Spotted Owl (Species not identified on the San Juan Public Lands) (Protected Activity Centers (NSO)	not mapped	not mapped	not mapped	not mapped	n/a
Uncompahgre Fritillary Butterfly NSO – known suitable habitat	not mapped	not mapped	not mapped	not mapped	n/a
Gunnison Sage Grouse NSO – within 0.6 miles of known lek site NSO– nesting habitat within 0.6 mi. to 4.0 mi. of lek site	0 0	280 67,757	196 53,522	280 69,061	n/a
Bald Eagle NSO – within ¼ mile of nest or winter roost site	3,710	547	547	547	n/a
Peregrine Falcon NSO – within ½-mile radius of cliff nesting complex	3,018	6,551	6,551	7,568	n/a
Goshawk NSO – within 30 acres of known occupied and alternate nests	not mapped	not mapped	not mapped	not mapped	n/a
Raptors (osprey) NSO - to protect raptor nests	79	79	79	79	n/a
Bats NSO – within ¼ mile of known maternity roosts	not mapped	not mapped	not mapped	not mapped	n/a
Colorado River Cutthroat Trout NSO – within 1/4 mile of known pure populations	not mapped	not mapped	not mapped	not mapped	n/a
Water Sources in Wild Horse Herd Area NSO – within 2,000-ft. radius of water sources	0	2,667	2,667	2,667	n/a
Sharp-Tailed Grouse Display Grounds TL- March 1 - June 15 within line of site of display ground	not mapped	not mapped	not mapped	not mapped	n/a
Heritage Districts (NSO)	n/a	4,700	4,700	4,700	n/a
Heritage Areas (NSO)	n/a	5,900	5,900	5,900	n/a
National Historic Trails (NSO) Stipulation	n/a	4,900	4,900	4,900	n/a
Glade Lake Site (NSO)	n/a	300	300	300	n/a
Bull Canyon (NSO)	n/a	20	20	20	n/a
Horse Range Mesa Paleo Site (NSO)	0	70	70	70	n/a
Indian Henry's Cabin (NSO)	0	10	10	10	n/a
Mesa Verde Escarpment (NSO)	600	7,400	7,400	0.00	n/a

Table 3.15.43 - NSO Stipulations by Acres, continued

SPECIES STIPULATED	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Sam's World / Mud Springs (NSO)		1200	0	0	n/a
To Protect Archeological Values (NSO)	0	500	500	500	n/a
Old-Growth Stands (NSO), Ponderosa Pine, Warm-Dry Mixed Conifer, and Pinyon-Juniper	0	0	0	0	n/a
Special Botanical Areas (NSO)	0	0	0	0	n/a
Existing and Proposed Research Natural Areas (NSO)	0	0	0	0	n/a
Ski Area NSO – within ski area boundary	0	21,900	4,400	21,900	n/a
Developed Recreation Sites NSO within ¼ mile of developed site	0	6,300	6,300	6,300	n/a
Administrative Sites NSO within ¼ mile of site	0	600	600	600	n/a
Dolores River Canyon NSO	0	33,800	23,000	33,800	n/a
National Recreation Trails and the Colorado Trail NSO – ¼ mile either side of designated trail	0	2,600	6,700	7,300	n/a
Recreation-Emphasis Corridors (Management Area 4) NSO – ¼ mile of major recreation corridors	0	25,400	25,600	24,900	n/a
San Juan Skyway NSO within 1/3 mile of Skyway corridor north of Durango	27,700	12,200	12,200	12,200	n/a
To Protect Recreational and Visual Values of the Dolores River Canyon, Menefee, and Weber Mountains NSO	0	1,100	1,000	1,100	n/a
Roadless Areas allocated to NSO	0	452,800	25,500	504,000	n/a
National Scenic Trails - (NSO) Stipulation	0	400	400	400	n/a
High Scenic-Integrity Objective and Level II	9,300	45,700	77,900	70,900	n/a
Visual Resource Foreground Management Area - NSO within mapped foreground areas	0	1,600	1,600	2,400	n/a
To Protect Scenic Values and Resources (NSO) Stipulation	0	149,900	142,800	144,800	n/a
Slopes Greater than or Equal to 40% NSO	0	22,200	20,000	20,200	n/a

Table 3.15.43 - NSO Stipulations by Acres, continued

SPECIES STIPULATED	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
Ecological Land Units 254, 386, 606, 720, 926, 20511D, 30506D, 34301D, 34306D, 34506D, 50803D, 50806D, 70806D, 70807D, 74803D, 80604D, 80803D, 80804D (NSO)	0	10,800	10,800	10,800	n/a
Fruitland Formation Outcrop Zone (NSO) Reservoirs Greater than 100 acres Within ¼ Mile of Reservoir NSO	0	4,000	4,000	4,000	n/a
Eligible Wild and Scenic River Segments NSO / CSU	0	58,700	42,000	68,600	n/a
Wetlands, Floodplains, Riparian Areas, Water Influence Zones, and Fens (NSO)	0	17,100	16,500	17,000	n/a