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Draft Environmental Impact Statement

Uinta National Forest Oil and Gas Leasing

Uinta National Forest, Utah

Uinta National Forest Oil and Gas Leasing Draft Environmental Impact Statement

Lead Agency

- USDA Forest Service

Cooperating Agencies

- Bureau of Land Management (BLM), Salt Lake Field Office
- State of Utah, Governor's Office of Public Land Policy
- Bureau of Reclamation (BOR), Upper Colorado Region, Provo Area Office
- Wasatch County, Utah

Responsible Official

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Abstract: The U.S. Forest Service (USFS) is conducting an environmental analysis of Uinta National Forest (UNF) lands with the intent of identifying National Forest System lands with Federal mineral rights that could be made available for oil and gas leasing within UNF boundaries, in accordance with the Mineral Leasing Acts. Under the National Environmental Policy Act (NEPA) of 1969, the USFS, along with its cooperating agencies, is responsible for identifying and assessing potentially significant environmental impacts and addressing issues associated with oil and gas leasing.

This Environmental Impact Statement (EIS) identifies UNF lands that could be made available for oil/gas leasing, describes and explains various leasing alternatives, describes the existing affected environment, and discusses the possible impacts of each alternative on the human environment. Environmental issues and concerns expressed by the public and various government agencies during public scoping have been incorporated into the analysis.

Reviewers should provide the Forest Service with their comments during the comment period for the draft environmental impact statement. This will enable the Forest Service to analyze and respond to the comments at one time and to use acquired information in the preparation of the final environmental impact statement, thus avoiding undue delay in the decisionmaking process. Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewers' position and contentions *Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 553 (1978)*. Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final environmental impact statement *City of Angoon v. Hodel*

(9th Circuit, l986) and Wisconsin Heritages, Inc. v. Harris, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). Comments on the draft environmental impact statement should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3).

Send Comments To

Submit comments to Reese Pope or Kim Martin, Uinta National Forest, PO Box 1428, Provo, UT 84603. Fax number: (801) 342-5144. The Provo office business hours for hand-delivered comments are 8:00 a.m. to 4:30 p.m. Monday through Friday, excluding holidays.

Oral comments must be provided at the Uinta NF Supervisor's Office during the above business hours by telephone (801) 342-5100, in person, or at public meetings such as one of the open houses scheduled below. Electronic comments must be submitted in a format such as an email message, rich text format (.rtf), or Word (.doc) to comments-intermtn-uinta@fs.fed.us.

Public Involvement Open Houses

Date	Time	Location
March 25, 2008	4:00 – 7:00 p.m.	88 West 100 North, Provo UT
March 26, 2008	4:00 – 7:00 p.m.	Wasatch County Senior Center 435 E 1200 S Heber City, UT

Date Comments Must Be Received

90 days from publication of NOA in the Federal Register.

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List of Acronyms

AADT	Annual Average Daily Traffic
APD	Application for Permit to Drill
ATV	All Terrain Vehicle
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BOR	Bureau of Reclamation
CEAA	Comprehensive Economic Analysis Area
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO	carbon monoxide
CSU	Controlled Surface Use
CUP	Central Utah Project
CWA	Clean Water Act
CWS	Community Water System
DDW	Utah Division of Drinking Water
DEIS	Draft EIS
DWR	Utah Division of Water Resources
ESA	Endangered Species Act
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
FEIS	Final EIS
FEMA	Federal Emergency Management Agency
FOGLRA	Federal Onshore Oil and Gas Leasing Reform
FWS	U.S. Fish and Wildlife Service
GCVTC	Grand Canyon Visibility Transport Commission
HUC	Hydrologic Unit Code
ID	Interdisciplinary
IRA	Inventoried Roadless Area
ITD	Interdisciplinary Team
JBR	JBR Environmental Consultants, Inc.

LAU	Lynx Analysis Unit
LN	Lease Notice
LRMP	UNF 2003 Land and Resource Management Plan, sometimes called the Forest Plan
LRMP FEIS	LRMP Final Environmental Impact Statement (FEIS)
MA	Management Area
MBTA	Migratory Bird Treaty Act
MIS	Management Indicator Species
MLA	Mineral Leasing Act
MMS	Minerals Management Service
MOU	Memorandum of Understanding
MP	Management Prescription
mya	million years ago
NA	Not Available for lease
NAAQS	National Ambient Air Quality Standards
NTNCWS	Non-Transient Non-Community Water System
NEPA	National Environmental Policy Act
NFS	National Forest System
NHPA	National Historic Preservation Act of 1966
NL	No Lease
NOI	Notice of Intent
NOx	nitrogen oxide
NRCS	National Resources Conservation Service
NSO	No Surface Occupancy
NWI	National Wetlands Inventory
PAOT	People At One Time
Pb	lead
PFC	Properly Functioning Condition
PM	Particulate Matter
PWS	Public Water System
RACR	Roadless Area Conservation Rule
RARE	Roadless Area Review and Evaluation
RARE II	Second Roadless Area Review and Evaluation
REAA	Rural Economic Analysis Area
RFDS	Reasonably Foreseeable Development Scenario

RFOGD	Reasonable Foreseeable Oil and Gas Development Group
RHCA	Riparian Habitat Conservation Area
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
RVD	Recreation Visitor Day
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SLT	Standard Lease Terms
SMP	Utah Smoke Management Plan
SO_2	sulfur dioxide
SUPO	Surface Use Plan of Operations
SWUA	Strawberry Water Users Association
TE	Threatened and Endangered
THPO	Tribal Historic Preservation Officer
TL	Timing Limitation
TMDL	Total Maximum Daily Load
TNCWS	Transient Non-Community Water System
tpy	tons per year
UDAQ	Utah Division of Air Quality
UDEQ	Utah Department of Environmental Quality
UDOGM	Utah Division of Oil, Gas and Mining
UDWQ	Utah Division of Water Quality
UDWLR	Utah Division of Wildlife Resources
UDWR	Utah Division of Water Rights
UNF	Uinta National Forest
USFS	U.S. Forest Service
USDWA	Utah Safe Drinking Water Act
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMS	Visual Management System
VQO	Visual Quality Objective
WMU	Wildlife Management Unit
WRAP	Western Regional Air Partnership
WUB FEIS	Western Uintah Basin Oil and Gas Leasing FEIS

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Summary

Introduction

In many parts of the United States, National Forest System (NFS) lands overlie geological formations that may contain oil and/or natural gas. The U.S. Forest Service's (USFS's) national policy on minerals states (USFS 2007):

> Exploration, development, and production of mineral and energy resources and reclamation of activities are part of the Forest Service ecosystem management responsibility. The Forest Service will administer its minerals program to provide commodities for current and future generations commensurate with the need to sustain the long-term health and biological diversity of ecosystems.

The Federal Government's policy for mineral resource management is expressed in the Mining and Minerals Policy Act of 1970: "[to] foster and encourage private enterprise in the development of economically sound and stable industries, and in the orderly and economic development of domestic resources to help assure satisfaction of industrial, security, and environmental needs." Within this context, the National Forests and Grasslands have an essential role in contributing to an adequate and stable supply of mineral and energy resources while continuing to sustain the land's productivity for other uses and its capability to support biodiversity goals. In accordance with this role, the USFS offers leases on many of the NFS lands for the purpose of drilling exploratory wells and extracting oil and/or gas (USFS 2007).

The USFS is conducting an environmental analysis of Uinta National Forest (UNF) lands with the intent of identifying NFS lands with Federal mineral rights that could be made available for oil and gas leasing within UNF boundaries, in accordance with the Mineral Leasing Acts. Under the National Environmental Policy Act (NEPA) of 1969, the USFS, along with its cooperating agencies, is responsible for identifying and assessing potentially significant environmental impacts and addressing issues associated with oil and gas leasing.

This Environmental Impact Statement (EIS) identifies UNF lands that could be made available for oil/gas leasing, describes and explains various leasing alternatives, describes the affected environment, and discusses the possible impacts of each alternative on the human environment. Environmental issues and concerns expressed by the public and various government agencies during public scoping have been incorporated into the analysis.

Proposed Action

Relationship to Forest Plan

Management of each administrative unit of the NFS (one or more National Forests or National Grasslands is governed by a Land and Resource Management Plan (Forest Plan). Most of the existing Forest Plans include general decisions, as part of management prescriptions, to provide for oil and gas leasing, but do not include decisions for leasing specific lands. Prior to the passage of the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (Leasing Reform Act) and except for acquired lands, the Forest Service had no authority to make decisions related to issuing or not issuing oil and gas leases on NFS lands. The Forest Plan EISs often do not fully meet the intent of the regulations to make site-specific leasing decisions. However, leasing decisions the Forest Service will make, including availability, can be used to develop amendments to the Forest Plans, as required.

Reasonably Foreseeable Development

In order to analyze the environmental effects that may occur as a result of a leasing decision, a projection of the kind and amount of activity that could be reasonably anticipated was made. This projection is called the Reasonably Foreseeable Development Scenario (RFDS). The RFDS for this analysis was developed using current and historical oil and gas development and exploration information, geologic interpretation, and projected market trends. The RFDS looks ahead a period of 10 to 15 years. The rapid changes in the understanding of the petroleum geology of the region along with the new exploration occurring in the Central Utah Overthrust Belt to the south of the UNF make it likely that advances in geologic understanding will render these RFDSs obsolete within that 10- to 15-year period.

For the purpose of evaluating the potential for oil or gas exploration on the UNF during such a period of time, the UNF was divided into nine analysis groups based upon surface geology, past exploration activities, and geography. These analysis groups are called Reasonably Foreseeable Oil and Gas Development Groups (RFOGDs), and have been named American Fork, Currant Creek, Deer Creek, Diamond Fork, Payson, Spanish Fork Canyon, Strawberry, Upper Provo, and Vernon.

Federal Management of Leases and Associated Development

The BLM is responsible for issuing oil and gas leases on Federal lands and on private lands for which the Federal government retains mineral rights. The BLM cannot issue leases for lands administered by the Forest Service without consent from the Secretary of Agriculture. In areas where exploration and development of oil and gas resources would conflict with the protection or management of other resources or public uses, the NEPA process identifies measures to mitigate impacts. Such mitigation measures may occur on oil and gas leases as either stipulations to users or as restrictions on surface occupancy.

Alternatives

Preliminary alternatives that were developed prior to the scoping process by the UNF ID Team included a No Action Alternative and a Proposed Action Alternative.

During scoping, concerns were raised about impacts of the alternatives on the following resources:

- municipal and culinary water sources (addressed in Section 4.7)
- sage grouse habitat (addressed in Section 4.9)
- moose habitat (addressed in Section 4.9)
- mule deer fawning habitat (addressed in Section 4.9)
- streams eligible for wild and scenic river classification (addressed in Sections 4.7, 4.13, and 4.11)
- visual resources (addressed in Section 4.11)
- developed recreation sites (addressed in Section 4.13)
- recreation residences (addressed in Section 4.13)

- inventoried roadless areas (addressed in Section 4.5)
- Bureau of Reclamation (Reclamation) Central Utah Project (CUP) withdrawn lands and facilities

To address these concerns and to account for new information about municipal and culinary water sources, the Proposed Action Alternative was amended to include lease stipulations for municipal and culinary water sources. Information about municipal and culinary water sources is the only new information that was incorporated into the Proposed Action Alternative since the 2003 Land and Resource Management Plan (LRMP).

Under direction of the Forest Supervisor, a third alternative was developed to address concerns raised about the above-mentioned resources. For Alternative 3, additional leasing stipulations would apply that would provide more protection measures for resources in the UNF. Alternatives considered in detail include:

Alternative 1 (No Action/No Lease)

The No Action Alternative would continue current management of leasing activities on approximately 197,000 acres of the UNF, which have been previously identified in the WUB FEIS. The remainder of lands on the UNF would continue to have no leasing opportunities.

Lands Available for Leasing

Approximately 197,000 acres of UNF System Lands are available for leasing under this alternative and approximately 193,000 acres have already been leased.

Leasing Stipulations

Current management of leasing activities in the UNF apply the oil and gas leasing stipulations as they are described in the WUB FEIS ROD.

Alternative 2 (Proposed Action)

The Proposed Action would make leasing decisions, including identification of stipulations, as required by 36 CFR 228.102(d) for UNF System lands.

Lands Available for Leasing

Land available for leasing includes all UNF System lands (897,400 acres) except those lands identified in Section 1.3.2 as not available for leasing (157,900 acres). Therefore, the total land available for leasing under this alternative is approximately 739,500 acres.

Leasing Stipulations

Leasing stipulations outlined on pages 3-7 and 3-8 of the LRMP are the basis of the stipulations applied forest-wide under this alternative. For all new leasable mineral operations, leasing stipulations would be applied according to the Recreation Opportunity Spectrum (ROS) class of the area, and any specific resource areas. In addition to lease stipulations outlined in the LRMP, the Proposed Action would take into consideration new information about culinary and municipal water sources located in the UNF.

Alternative 3 (Modified Resource-based Stipulations)

The third alternative would make leasing decisions, including identification of stipulations as required by 36 CFR 228.102(d) for the UNF System lands.

Lands Available for Leasing

This alternative specifically excludes inventoried roadless area (IRA) acreages from leasing availability. Therefore, land available for leasing would include all UNF System Lands (897,400 acres) except for inventoried roadless areas (554,850 acres), and the balance of those lands not available for leasing (approximately 118,000 acres. Therefore, land available for leasing under the third alternative is reduced to approximately 224,550 acres.

Leasing Stipulations

Leasing stipulations outlined in the LRMP pages 3-7 and 3-8 are the basis of the stipulations applied forest-wide. In addition to the more restrictive leasing stipulations for resources, Inventoried Roadless Areas would not be leased under this alternative.

Affected Environment

The UNF encompasses a total of approximately 983,670 acres of land, including approximately 897,400 acres of National Forest Lands. The EIS analysis area includes all NFS Lands within the UNF with a Federally-owned, leasable mineral estate. This excludes the following acreages within UNF boundaries:

- Designated wilderness areas (approximately 58,400 acres)
- Strawberry Project lands (approximately 60,700 acres)
- Other lands where the subsurface oil and gas mineral estate is not under Forest Service jurisdiction (approximately 38,800 acres)

The total leasable acreage under analysis is approximately 739,500 acres.

The UNF is considered an urban forest, which means it is located near a highly populated area and that much of the use comes from residents of the urban area. The urban area for the UNF is Utah County and the Wasatch Front. Other counties within the UNF boundary include Wasatch, Juab, Sanpete, and Tooele. Counties that are adjacent to the UNF include Carbon, Duchesne, Salt Lake, and Summit counties. The Forest has three Ranger Districts: Heber, Pleasant Grove, and Spanish Fork.

A large portion of current Utah residents have a strong sense of place in connection with the Forest and surrounding area, as many families have lived here for generations. The openness and solitude offered by the NFS will become increasingly important to residents as open space becomes more scarce in and near urban areas. The resources of the UNF play an important role now and will continue to do so in the future for many of these people.

Many UNF users have economic dependencies on Forest resources. Water originating on NFS lands serves agricultural, industrial, business, and residential uses. Grazing permittees rely on the availability of suitable forage for grazing livestock. Outfitters and guides for various wildlife and recreation-related uses rely on National Forest resources for all or part of their living. Many local communities rely on the employment and income generated as a result of the existence and/or use of forest resources.

The UNF includes a variety of landscapes varying from the high western desert of the Vernon Unit, to high mountain peaks of Mount Nebo (elevation 11,877 feet) and Mount Timpanogos

(elevation 11,750). A wide range of elevation and landscape types provide the Forest with climate, soils, and plant and animal communities that are highly diverse.

Roads support a variety of activities including recreation, driving for pleasure, hunting and fishing, and commodity uses such as grazing, timber harvest, and mineral development. In addition, roads also allow administrative access to perform forest health and protection activities (such as watershed and vegetation improvement).

The UNF is continuously updating its inventory of roads. The 2005 State of the Forest Report indicated that there are currently 1,218 miles of authorized roads, of which 1,128 miles are open for public use. In 2005 453 miles of road were maintained (USFS 2006).

There are currently 35 Inventoried Roadless Areas (IRAs) on the UNF totaling approximately 554,850 acres, or about 62 percent of the UNF (Figure 3.15: Forest-wide Map of Roadless Areas). Table 3.18 presents total roadless acres within each IRA in the UNF (USFS 2003).

Roadless areas provide opportunities to manage dispersed recreation, sources of public drinking water, and undisturbed landscapes that provide privacy and seclusion. In addition, these areas serve as safeguards against the spread of invasive plant species and often provide important habitat for rare plant and animal species. They support a diversity of native plant species and provide opportunities for monitoring and research (USFS 2003a).

On the UNF, wetlands are associated with perennial or intermittent water bodies, or other water sources (e.g., springs). There are approximately 10,186 acres of wetlands on the UNF that have been delineated by the USFWS, and approximately 800 miles of perennial streams, 2,030 miles of intermittent streams, and 17,770 acres of lakes and reservoirs (USFS 2003) with which they are associated.

Wetlands are integral parts of aquatic and terrestrial habitats that provide diverse ecosystem functions. Wetlands are sources of primary productivity, organic deposition and flux, and nutrient cycling; and provide unique wildlife, fish, and plant habitats (Brinson 1993, USFS 2003). Activities such as timber harvest, mining, and grazing have resulted in damage to aquatic resources on the UNF, with long-term implications to aquatic habitat and water quality (USFS 2003), thus increasing the value of wetlands on the UNF to naturally restore ecosystem function.

Wet meadows or bogs/fens are a type of wetland that is present on the UNF at high elevations. There are 583 acres of wet meadows and bogs/fens across the UNF, predominantly in the Vernon, Strawberry, and Currant Creek RFOGDs (figure 3.16). Wet meadow areas on the UNF are small and scattered, but are species-rich, containing a variety of sedges, rushes, grasses, and forbs (USFS 2003). Special status species that occur only on wet meadows in the UNF include dainty moonwort (*Botrychium crenulatum*) and Ute ladies' tresses (*Spiranthes diluvialis*) (see Section 3.9.2: Introduction to Special Status Species).

Riparian Habitat Conservation Areas (RHCAs) on the UNF are associated with traditional riparian corridors, perennial and intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems. There are three RHCA classes of varying widths offering varying levels of protection: Class I; Class II, and Class III. The distribution of RHCAs on the UNF is shown in figure 3.18.

Water quality in the UNF is influenced by several factors including geology, soils, vegetation, and human activities. Low dissolved oxygen, high phosphorous loads, and sedimentation are the prevailing water quality problems in the UNF. In general, water quality issues in the UNF are closely related to human activities that cause surface disturbance such as road use, grazing, and recreational use.

A major influence on water resources in the UNF is the Central Utah Project (CUP). This project consists of a network of dams, water diversions, and reservoirs to transfer water from the Duchesne River and its tributaries to the Wasatch Front. CUP facilities are found in many RFOGDs with oil and gas potential, but are not located within the American Fork, Payson, Spanish Fork Canyon, or Vernon groups. However a Reclamation facility is located adjacent to the Payson Group to the north.

Surface water protection zones in the UNF are located primarily in the northern and eastern portion of the UNF; groundwater protection zones are located primarily in the western part of the UNF (see Figure 3.20: Forest-wide map of Drinking Water Protection Zones). All RFOGDs have designated drinking water protection zones.

Groundwater has not been well-studied on the UNF. Numerous springs on UNF lands represent discharge of typically smaller, more locally recharged areas; they are often used for livestock watering and for providing water to support perennial stream flow, wildlife, and wetland vegetation. Nearly all springs along the Wasatch Front have been developed for municipal use.

Precipitation supporting UNF water resources primarily occurs as snowfall between October and April (USFS 2003). Snow provides the primary source of recharge to groundwater resources and supports perennial stream flows. Annual precipitation on the UNF is highly dependent on elevation and aspect, and ranges from approximately 13 to over 30 inches (USFS 2003).

Within the UNF, four stream segments have been determined to be eligible for adding to the National Wild and Scenic Rivers System. None have been designated to date.

The majority of streams and reservoirs on the UNF provide water for domestic and agricultural uses, cold-water fisheries, recreation, and wildlife. Table 3.23 lists UNF streams and reservoirs included in Categories 4A and 4C. Category 1, 2, and 3 reaches are too numerous to include here, but can be found in the report (UDEQ 2006c). There were no category 5B UNF streams or reservoirs in the report during this current cycle.

Plant communities of the UNF are varied because of the different types of geology, landforms, and soils that are found throughout the UNF. Vegetative communities on the UNF are typical of semi-arid mountainous regions (USFS 1996b), and exist in a full range of seral stages and age classes (USFS 2003a). Major plant communities on the UNF can be divided into nine types including aspen, conifer (including Douglas-fir/white fir and spruce/subalpine fir), tall forb, mountain brush, pinyon/juniper, sagebrush, riparian, grass, and alpine. Major plant communities and their locations are summarized in table 3.24. Their locations can be seen in figure 3.22: Forest-wide Vegetation Map.

Thirty species of noxious weeds and other weed species of concern are known to occur on the UNF (USFS 2003). Location of noxious weed infestations can be seen in figure 3.23: Noxious Weeds. Noxious weed infestations occur in all RFOGDs. The largest infestation occurs in the Strawberry MA on Strawberry Project Lands. Musk thistle is the most prevalent of the noxious

weed species and occurs in all RFOGDs. Alpine plant communities are currently the only community not immediately threatened by noxious weeds.

Traditional plant gathering in the UNF is mainly practiced by the Northern Ute Tribe and primarily occurs in the Strawberry MA. Targeted plants include mostly forbs. The extent that these plants are available greatly affects traditional plant gathering.

Due to the wide variety of vegetation on the UNF, the diversity of wildlife species is also high (USFS 2003a). Wildlife is divided into the following categories:

- Mammals, including big game, bats, predators
- Birds, including raptors and owls, upland game birds, woodpeckers, migratory birds
- Fishes
- Reptiles

The U.S. Fish and Wildlife Service (FWS) identifies three Threatened and Endangered (TE) species that are known or expected to occur on the UNF (USFWS 2007a). Seven other TE species listed in Appendix E: Table 1 of the LRMP FEIS have been extirpated from the UNF. There is one candidate species found in the UNF.

In addition to TE species, the Regional Forester identifies Sensitive species as those for which population viability is a concern, as evidenced by significant current and predicted downward trends in population numbers, density, and/or habitat capability that would reduce a species' existing distribution. TE species potentially occurring on the UNF are listed in table 3.26, followed by background information on each species.

Air quality within the UNF is generally considered good to excellent. However, some of the surrounding urban areas are currently designated by the EPA as non-attainment areas for certain air pollutants, and there are portions of the UNF that lie within these areas. Maintenance areas are also found near the UNF.

The term Visual Quality Objective (VQO) refers to the degree of acceptable visual alteration of the landscape and is defined as a desired level of scenic excellence based on physical and sociological characteristics of an area.

Of the acres in the UNF with designated VQOs, the majority are partial retention (47 percent) and modification (32 percent) (figure 3.28 Forest-wide map of VQOs; table 3.39). Nearly one-third of scenery acres (32 percent) have a VQO of modification. Approximately one-fifth (22 percent) of the scenery acres are preservation or retention in the UNF. These areas are managed so that activities are not perceptible to the viewer.

Cultural sites within the UNF are classified into two types: prehistoric and historic. Culturally diagnostic artifacts are rare, but those documented suggest Archaic through Late Prehistoric use along the Wasatch Range and Paleo-Indian through Late Prehistoric use in the Vernon area. Documented historic sites suggest temporary and sporadic use as indicated by trash scatters, camps, etc., and long-term use associated with mineral extraction, logging, and ranching. Of the 522 documented archaeological sites, 173 (33 percent) are eligible for the National Register of

Historic Places, 259 (49 percent) are not eligible, and 66 (13 percent) are unevaluated for eligibility. In addition, 24 sites (5 percent) are of unknown National Register status.

The UNF is particularly popular for recreation due to the myriad activities it offers, as well as its close proximity to over a million people along the Wasatch Front.

The top five recreational activities in 2001 for visitors to the UNF were general (relaxing, escaping urban areas), viewing natural areas, hiking, scenic drives, and wildlife viewing.

The USFS uses the ROS to classify the uses of the land and all of its components into individual classes. The ROS Classification System describes different classes of outdoor environments, activities, and experience opportunities, and uses environmental components to identify ROS classes. The ROS classes applied to the UNF are Primitive, Semi-Primitive Non-Motorized, Semi-Primitive Motorized, Roaded Natural, Roaded Modified, and Rural. ROS classes within the UNF and percentages of each are listed below (figures are rounded to the nearest percent):

- Semi-primitive Motorized: 40 percent
- Roaded Natural: 30 percent
- Roaded Modified: nearly 10 percent
- Primitive: 7 percent
- Semi-primitive Non-Motorized: 14 percent

The UNF has many developments and amenities to accommodate a high volume of recreational users. Figure 3.29: Forest-wide Recreation Map, shows the location of developed campgrounds, trailheads, and other facilities. Developed recreation consists of visitors using areas that have been specifically designed for concentrated public use. These amenities consist of developments such as campgrounds, picnic sites, interpretive sites, observation points, and boating and fishing access sites.

Developed recreation site capacity is measured in terms of People At One Time (PAOT), which is the number of people that a developed site was designed to accommodate (USFS 2003). Developed recreation on the UNF had a capacity of approximately 32,200 PAOT, for a yearly estimated capacity of 6 million RVDs (Recreation Visitor Days) (USFS 2003). Efforts continue to ensure that the requirements for high visitor use are met (USFS 2003).

There are currently 248 miles of non-motorized trails for non-motorized use (USFS 2006). Wilderness areas in the UNF also provide opportunities for non-motorized recreation, including dispersed camping and hiking.

Scenic driving is popular on many of the UNF's scenic byways, including the Mount Nebo Scenic Byway, the Alpine Loop Scenic Backway, the Provo Canyon Scenic Byway, and other U.S. highways that provide opportunities to drive for pleasure. In addition, off highway vehicle (OHV) use and snowmobiling have been attracting an increasing number of visitors to the UNF (Hayes 2006).

Hunting is a popular recreational activity in the UNF. Hunting and issuance of hunting permits is managed by UDWLR (Utah Division of Wildlife Resources). Hunting data for the WMUs (Wildlife Management Units) in the UNF show that in 2005 mule deer was the most hunted big

game animal, followed by elk. Table 3.58 summarizes 2005 big game harvest data for all WMUs that overlap the UNF.

Environmental Consequences

Effects that may occur from implementing the three alternatives include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, and health—whether direct, indirect, or cumulative. Effects may also include actions which may have both beneficial and detrimental, or short- and long-term consequences.

The authorization of a lease grants the lessee rights to explore for and develop oil and gas within the terms and stipulations of the lease. The exercise of these rights results in implementation of connected actions. Connected actions were identified in the RFDS and are summarized below.

In the context of this EIS, connected actions that are considered include:

- exploratory drilling
- abandonment activities
- development associated with exploratory drilling such as the building or upgrading of roads

Connected actions (as listed above) are the basis of the environmental analysis from which the leasing decisions will be made. Decisions on the lands that will be administratively available, and the subsequent decision authorizing leases, are based upon analysis of the *likely* environmental effects of the connected actions. Connected actions associated with each alternative are summarized below.

No Action Alternative

One well is projected under this alternative. Possible location of this well is unknown. The following summarizes activities causing ground disturbance under the No Action alternative.

Table 0.1 Summary of surface disturbance for the No Action Alternative.

Activity	Amount	Acres Disturbed
Exploratory Well Pad	1	2
Light Road Construction	1 mile	2.4
Heavy Road Reconstruction	0.7 mile	2.5
Total	NA	6.9

Proposed Action and Modified Resource-based Alternatives

The following description of connected actions will be applicable for both of these action alternatives.

The disturbance associated with the construction of each well pad is estimated at two acres. Well pad facilities would include the well head, drill rig, mud tanks, pipe racks, crew facilities (e.g., dog house, trailers, chemical toilets, etc.), water and fuel tanks, space for support vehicle parking and turnaround, and a reserve pond for produced water. Additional facilities may be required for such post-well installation activities as formation fracturing depending on individual drilling

results. When factoring in associated infrastructure, primarily access roads, it is assumed that disturbance would be approximately 5 acres per exploration well. This assumption is based upon one mile of new road construction and one mile of road widening per well. Drill rig mobilization is estimated to involve road construction as well as well pad construction. Roads that are not of sufficient current width will need to be widened to a width of 20 feet to allow drilling and related equipment to pass. New roads would need to be 20-feet wide as well.

The RFDS predicts oil and gas connected actions in only six of the nine RFOGDs. However, for purposes of analysis one exploratory well and approximately 5 acres of disturbance were also assumed for RFOGDs without known oil and gas potential (American Fork, Upper Provo, and Vernon Groups), because oil and gas exploration is still considered prospective on these.

Table 0.2 Summary of projected connected actions for RFOGDs with oil and gas potential.

RFOGD	Projected number of wells	Acres Disturbed
Currant Creek	2	10
Deer Creek	1	5
Diamond Fork	1	5
Payson	1	5
Spanish Fork	1	5
Strawberry	3	15
*American Fork	1	5
*Upper Provo	1	5
*Vernon	1	5
Production Pad	—	1.2
Total	**12**	**61.2**

* RFOGD without known oil and gas potential.

Cumulative Impacts

Cumulative impacts are those impacts on the environment that result from the incremental impact of reasonably foreseeable future actions when added to other past and present activities, regardless of what person or agency undertakes such other actions. To determine cumulative effects, the effects of a potential oil and gas leasing development are added to those resulting from past and present activities, as well as other proposed future actions within the analysis area. At present, this includes water development, grazing, construction, wetland development, aquatic habitat improvement, vegetation management activities for wildlife habitat, watershed improvements, road stabilization and restoration, and possible land acquisition.

The small number of exploratory wells projected to be constructed for this project in each alternative would make a very small contribution to the cumulative effects occurring to these resources in the study area. The UNF is currently in a “maintenance mode,” and thus no new development projects of any consequence are anticipated in the foreseeable future that would have significant resource impacts.

Socioeconomic Resources

The exploratory wells projected to be constructed for this project in each alternative would make a very small contribution to both beneficial and adverse cumulative effects occurring to socioeconomic resources in the study area.

Soils and Geologic Hazards

Road widening, construction, and well pad construction for up to 12 exploratory wells would have no effect on the forest as a whole in terms of soils and geologic resources, as long as required stipulations and forest plan standards are maintained. Some localized cumulative impacts would occur, as noted under the introduction to this section.

Transportation

The minimal amount of road construction needed for exploration activity projected in each alternative would not substantially contribute to the cumulative effects occurring to the transportation system in the study area. The road building that occurs would be a short-term activity; after reclamation there would not be cumulative effects to roads or the transportation system on the Forest.

Inventoried Roadless Areas

No long-term cumulative impacts to roadless areas are anticipated under any of the alternatives. Any roads or other facilities that would built in connection with oil and gas leasing would be temporary and once reclaimed would not result in long-term or cumulative impacts on roadless areas.

Watershed Resources, Including Wetlands, Floodplains, and Riparian Areas

A minimal amount of impacts to wetlands, wet meadows, floodplains, and riparian areas are expected under any of the three alternatives. The Proposed Action and Modified Resource-based Alternatives would apply more strict stipulations for the protection of watershed resources to the areas where leasing is permitted than what is currently in place. There would not be a significant contribution to the cumulative effects occurring to watershed resources on the UNF. In addition, impacts that do occur would likely be short-term and would be reclaimed following exploration activities.

Water Resources Including Culinary and Municipal Water Systems, Surface Water, and Ground Water

Surface disturbance activities that could possibly affect water quality that have been occurring and are ongoing throughout the UNF include existing roads and prescribed burning and thinning. Burning and clearcutting in three of the past four years have encompassed 6,136 acres on the UNF. These areas may also be sources of water quality degradation until surface stabilization has occurred.

The cumulative impacts of 6.9 to 61.2 acres of disturbance would be negligible, unless located within Drinking Water Source Protection zones, where impact would be minimal.

Vegetation, Noxious Weeds, and Invasive Species

The majority of present and foreseeable future actions would have beneficial effects on vegetation. Noxious weed controls are in place during all projects and in many cases, managed areas are monitored after project completion for weed infestation. Areas are usually reseeded with desirable species after treatments.

The cumulative impact of up to 61.2 acres of vegetation disturbance would be negligible unless a large amount of disturbance occurred in riparian vegetation. Impacts from riparian disturbance could be minor to moderate and long-term. However, stipulations and analysis completed in the APD stage of any proposed drilling programs would minimize potential impacts to riparian areas. Disturbances are unlikely to occur within riparian vegetation under the Proposed Action and Modified Resource-based Alternatives.

Terrestrial and Aquatic Flora and Fauna, Including Threatened, Endangered, Sensitive, and Management Indicator Species

The cumulative effects of the No Action Alternative would be negligible in terms of habitat loss and fragmentation. The No Action Alternative would not add a significant amount of habitat loss to that already occurring in the past, present, and foreseeable future, independent of any potential Oil and Gas activity.

Cumulative effects of the Proposed Action and the Modified Resource-based Alternatives would be negligible to minor in terms of habitat loss and fragmentation, because the amount of expected habitat loss under the Proposed Action Alternative is small and is not likely to add a significant amount to that already occurring on the UNF. Most past, present, and future activities on the UNF have been restorative in nature, such that the net effect of oil and gas leasing, in general, would be negligible considering all activities on the UNF. Within the American Fork RFOGD, fewer beneficial activities are projected so the cumulative effects have the potential to be minor. American Fork also contains a relatively large amount of forested riparian habitat, the most imperiled habitat on the UNF. Because no direct impacts to forested riparian habitat would occur due to protection of RHCAs under the Proposed Action Alternative, cumulative effects would last for the duration of exploration activities (short-term noise effects).

Air Resources

Under the No Action alternative, the combined impact of one exploratory well in combination with the other listed activities is unlikely to result in adverse cumulative effects on air quality resources because of the large size of the area and the relatively small scale of activities. Should the exploratory well result in a producing well there would be a short-term increase in VOC emissions from the producing well.

With a greater number of predicted wells under the remaining two alternatives, the cumulative effects would be greater than those listed for the No Action alternative, but would still be unlikely to result in adverse effects on air quality resources. The overall air quality of the air shed may have some short-term cumulative effects resulting from the combined emissions from all activities. Should exploration result in the development of an oil and gas filed, there would be short-term increases in VOC emissions.

Visual

There are no major foreseeable activities on the UNF that would cause cumulative effects. Over the long-term, full reclamation of exploratory sites would be achieved.

Cultural

Under all three alternatives, a Class III inventory will be conducted in advance of all ground disturbing activities associated with oil and gas development on the UNF. Sensitive archaeological sites will be avoided or, if avoidance does not provide the required protection, adverse effects will be mitigated in an acceptable way. It is anticipated that avoidance can be

achieved in most cases, and that any activities undertaken would not contribute to cumulative effects on cultural resources.

Recreation

Cumulative impacts under the No Action Alternative would include the possible displacement of recreation use during active operations of exploratory drilling, increasing recreational pressures in other areas of the UNF. The majority of cumulative effects would occur to dispersed recreation since developed recreation sites have a NSO stipulation and would be avoided. Since noise and visual impacts are only expected to encompass a ¼ mile radius around the well pad and access road, approximately 700 acres of recreation would be temporarily displaced. Since this is only a fraction of Forest-wide acres, no significant cumulative effects are anticipated under this alternative.

Cumulative impacts under the remaining two alternatives would include the possible displacement of recreation use during active operations of exploratory drilling, increasing recreational pressures in other areas of the UNF. The majority of cumulative effects would occur to dispersed recreation since developed recreation sites have a NSO stipulation. Since noise and visual impacts are only expected to encompass a ¼ mile radius around well pads and access roads, approximately 9,600 acres of recreation would be displaced Forest-wide. It is anticipated that this type of disturbance would not occur at one time, or in one place; therefore, the disturbance would be short-term only, and unlikely to cause relocation patterns on the UNF.

Irreversible and Irretrievable Commitment of Resources

An irreversible commitment of resources refers to the loss of production or use of a resource due to a land use decision, that once executed, cannot be changed. An irretrievable commitment of resources refers to losses of production or use of renewable resources.

Issuance of a lease would be an irreversible decision for the life of the lease. If a discovery is made and once the oil and gas has been extracted, it is not replaceable. Potential oil and gas reserves are not expected to be irretrievably committed under all alternatives, because the exploratory wells are generally not anticipated to result in full-field development.

Potential adverse effects on watershed resources include accelerated erosion and mass-wasting, increased stream sedimentation, decreased water quality, gully development, increased slope stability, altered stream flows and channel degradation, long-term loss of vegetation productivity, and loss of wetland/riparian resources. Potential adverse impacts can be greatly reduced by appropriate site-specific mitigation and avoidance at the APD stage, including adherence to Forest Plan standards and guidelines, and use of BMPs. Effects on watershed resources are irretrievable (loss of production during the period of impact), and may be irreversible (not-restorable) depending on the amount and success of reclamation.

The minor and localized increases in fugitive dust and vehicle exhaust that would occur under all three alternatives would not be an irreversible or irretrievable commitment of air quality resources.

There would be an irretrievable loss of big game habitat during drilling, that would last until the facilities are closed and the disturbed areas are reclaimed. The commitment is for the duration of active exploratory drilling operations, which typically averages about one year. The loss of big game habitat is not an irreversible commitment past active exploratory drilling operations. If

roads are kept open after the life of the project, the irreversible and irretrievable effects will continue for a longer period of time.

There would be no irreversible or irretrievable commitment of resources affecting endangered or threatened species or their habitat, or sensitive species or their habitat under the alternatives.

There would not be an irreversible loss of roadless resources due to exploration activities. The potential acres disturbed by each alternative are shown in Section 4.5. Exploration activity typically lasts about 80 days. The roadless character could eventually return to disturbed lands with successful reclamation, including closure and reclamation of all access roads.

Primitive and Semi-primitive Non Motorized areas have the potential to be impacted. The amount of potential direct and indirect impacts is shown in Section 4.5.9. There would be an irreversible loss of the SPNM resource which would last until the oil and gas activity ceased and the disturbed areas were successfully reclaimed. There would be no irreversible or irretrievable loss of developed recreation sites.

Retention and Partial Retention VQO lands would experience loss in visual quality wherever oil and gas activity occurred with an SLT stipulation (Alternative 2). This loss in visual quality would last until the activity ceased and the area was reclaimed. With successful reclamation there would be no irretrievable loss of visual quality.

No irreversible or irretrievable impacts to cultural resources are expected due to established laws and regulations which will avoid impacts to significant prehistoric and historic cultural resources.

Oil and gas leasing activity would cause an irreversible impact to the transportation resource for the life of the activity. Impacts from increased traffic, road surface deterioration, and increases in dust and noise would cease once the activity was completed.

Unavoidable Adverse Effects

Minor effects on watershed, water, and soil resources, including increased erosion, are probably unavoidable under all alternatives. However, significant adverse impacts can be avoided by use of appropriate site-specific mitigations and avoidance of critical areas. Prevention of unavoidable adverse effects for watershed, water, and soil resources will result both from stipulations evaluated in this EIS, and from Conditions of Approval attached at the APD stage.

Minor losses of critical big game and sage grouse habitat would occur under all alternatives, from construction of well sites and roads. These losses of habitat would represent less than one percent of available habitat. Some disturbance-related indirect effects may be unavoidable, but substantial losses of habitat effectiveness can be prevented by appropriate mitigations.

There are no unavoidable adverse effects to mineral resources, threatened, endangered and sensitive species, or Research Natural Areas.

Unavoidable impacts would occur to IRAs whenever oil and gas activity takes place within roadless areas. These impacts would include effects to the roadless characteristics of natural appearance and opportunity for solitude. The Proposed Action Alternative has the potential to disturb the most roadless area, and would allow oil and gas activity under an SLT stipulation, which may not provide the necessary control to limit or reduce potential impacts.

Unavoidable impacts to Semi-primitive Non Motorized areas would occur wherever oil and gas activity takes place within SPNM lands. Leasing stipulations that would apply under all alternatives would reduce impacts; however, the increased human presence would cause unavoidable effects to the semi-primitive character of the area.

The presence of industrial activity, including the construction of new access roads and the actual well drilling equipment and ancillary facilities/structures would cause unavoidable impacts to the scenic quality of Retention and Partial Retention VQO lands. Unavoidable impacts would include form, line and color contrasts created by the new roads and drilling equipment. These impacts can be greatly reduced by careful siting of wells. This exploration activity would be a short-term impact; there would be no long-term unavoidable impacts.

Impacts to archaeological sites resulting from increased public access and use are considered probable and unavoidable.

No unavoidable adverse effects would occur to transportation or socioeconomic resources.

Relationship between Short-term Uses and Long-term Productivity

Short-term activities, including building of roads and well pads, may result in long-term effects to watershed resources, such as soil erosion, gully formation, stream sedimentation, and other effects. Adverse effects on soil and watershed resources would reduce productivity of other resources, including vegetation and wildlife. Most adverse affects can be prevented by adequate site-specific mitigation and avoidance of sensitive areas.

The stipulations included in this EIS would provide varying levels of protection, but additional and more site-specific mitigation would be required at the APD stage.

In general, direct losses of wildlife habitat would occur until wells are abandoned or closed, and the sites reclaimed. Similarly, direct losses of wildlife habitat will occur until roads are closed. Short-term activities could affect long-term productivity if there are substantial indirect effects on big game, such that there are major changes in habitat use, or if sage grouse leks are destroyed or made unsuitable.

Short-term activities could cause long-term impacts to RNAs if oil and gas development occurs and severely modifies the character of these areas. RNAs are not located in the No Action Alternative, and the action alternatives have stipulations preventing such degradation.

Short-term use of both the roadless and semi-primitive non motorized (SPNM) environment for oil and gas activities could affect the long-term productivity of these resources if access roads built for oil and gas leasing activities remained after the activity had ceased. Closure and reclamation of both the well site and roads built to serve these sites would prevent long-term effects to the roadless and SPNM resource.

With successful reclamation there would not be long-term impacts to the scenic quality of lands used for oil and gas exploration activities. Required mitigations, and existing laws and regulations that would be applied to oil and gas leasing activity, would prevent long-term effects to transportation, cultural, or socioeconomic resources.

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