Arapaho and Roosevelt National Forests and Pawnee National Grassland

Oil and Gas Leasing Analysis

Heritage Resource Report

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Table of Contents

Introduction ................................................................................................................................. 1
Overview of Issues Addressed ..................................................................................................... 1
Affected Environment .................................................................................................................. 1
Heritage Resources Existing Condition ..................................................................................... 1
Desired Condition ...................................................................................................................... 5
Environmental Consequences ..................................................................................................... 6
Methodology .............................................................................................................................. 6
Spatial and Temporal Context for Effects Analysis ..................................................................... 6
Alternative 1 – No Leasing .......................................................................................................... 9
Alternative 2 – No Action .......................................................................................................... 10
Alternative 3 – Leasing under No Surface Occupancy (NSO) ..................................................... 12
Regulatory Framework .............................................................................................................. 13
Summary of Effects .................................................................................................................. 15
References ................................................................................................................................ 1

List of Tables

Table 1. Prehistoric Cultural Resource Types on the PNG ......................................................... 2
Table 2. Historic Cultural Resource Types on the PNG ............................................................... 2
Table 3. Cultural Components within the Prehistoric Chronology for the Platte River Basin ...... 3
Table 4: Summary of Effects to Cultural Resources by Alternative ............................................ 16
Introduction

Overview of Issues Addressed
The analysis of effects to cultural resources for the Oil and Gas leasing analysis focused primarily on the determining the potential of the decision to adversely affect historic properties. Historic properties are defined in 36 CFR 800.16 (l)(1) as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior”. The relevant issue to the cultural resources analysis was whether the project might alter the characteristics of historic properties that make them eligible for the NRHP by diminishing the property’s integrity of location, design, setting, materials, workmanship, feeling, or association. Another valuable indicator when assessing adverse effects to historic properties is the potential loss of information important to history or prehistory. The overall analysis indicator for the project should be the potential effects to historic properties.

The spatial and temporal context for the effects analysis is defined in more detail in the environmental consequences section of the analysis and focuses on determining the area of potential effects (APE) of the proposed decision. The APE for the project was defined as all lands that were designated as administratively available for leasing under the 1997 ROD that have not already been leased. Additional adjacent lands were also considered for impacts to cultural resources under the oil and gas projections under the Reasonably Foreseeable Development Scenario to determine the potential effects to the integrity of setting and feeling and or potential cumulative impacts.

Affected Environment

Heritage Resources Existing Condition

Literature Review

The Pawnee National Grassland (PNG) contains 184,495 acres of Forest Service (FS) lands. The current knowledge base regarding heritage resources in the study area derives from archaeological surveys totaling 56,800 acres (30% of the PNG). Within the project area, there are 1,847 known prehistoric and/or historic archeological sites ranging in age from ca. 11,000 B.C. until historic times.

Prehistoric sites make up 70% (n=1307), historic sites make up 24% (n=460), and the remaining 6% of the sites (n=80) contain both prehistoric and historic components. Sites that are listed, eligible for listing or have not been fully evaluated for listing on the National Register of Historic Places make up 17% (n=322) of the recorded cultural resources on the Pawnee National Grassland. The following summaries of prehistoric and historic sites on the Pawnee National Grassland were derived from the Forest Service spatial and tabular databases and the Office of Archaeology and Historic Preservation spatial and tabular databases in January of 2013.
Table 1. Prehistoric Cultural Resource Types on the PNG

<table>
<thead>
<tr>
<th>Prehistoric Site Types</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Lithic Sites</td>
<td>331</td>
</tr>
<tr>
<td>Open Camp Sites</td>
<td>193</td>
</tr>
<tr>
<td>Stone Quarry or Lithic Procurement Sites</td>
<td>53</td>
</tr>
<tr>
<td>Stone Circle or Open Architectural Sites</td>
<td>34</td>
</tr>
</tbody>
</table>

Table 2. Historic Cultural Resource Types on the PNG

<table>
<thead>
<tr>
<th>Historic Site Types</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homesteads, Ranches or Historic Habitation Sites</td>
<td>125</td>
</tr>
<tr>
<td>Historic Ditches, Canals, or Water Control or Development Sites</td>
<td>16</td>
</tr>
<tr>
<td>Railroad Grades and Railroad Development Sites</td>
<td>14</td>
</tr>
<tr>
<td>Rural Schoolhouse Sites</td>
<td>2</td>
</tr>
<tr>
<td>1864 Battle of Cedar Creek Associated Sites</td>
<td>2</td>
</tr>
<tr>
<td>Civilian Conservation Corp and WWII Civilian Public Service Camp</td>
<td>1</td>
</tr>
<tr>
<td>Cold War Atlas E Missile Site</td>
<td>1</td>
</tr>
<tr>
<td>Resettlement Administration Headquarters Site</td>
<td>1</td>
</tr>
</tbody>
</table>

Prehistoric Overview

Prehistoric sites thus far recorded on the Pawnee National Grassland range from older than 11,000 years to approximately 150 years ago. Prehistoric research themes generally include questions about local chronology, individual site function(s), settlement patterns and site location variables, lithic procurement and preferential raw material selection strategies, lithic technology, and resource exploitation patterns (Eighmy 1984).

Site types within the Pawnee National Grassland primarily reflect hunting and gathering activities, stone tool manufacture, and habitation sites. Architectural sites may occur within the more well-watered drainages. These sites are represented by projectile points, grinding stones, butchering tools, other lithic (stone) debris, and pottery. Features such as rock-lined pit houses, lithic procurement sites (quarries), stone circles, and rock overhang shelters have been found. Prehistoric sites can be expected most commonly within ½ mile of water sources. Other predicted site locations are areas of rock overhangs and ridge tops that contain silicified rock deposits. Such deposits generally consist of cherty materials such as jasper which were utilized by Native Americans for stone tool manufacture. These sites can be very long, exceeding a mile or more in length.
Table 3. Cultural Components within the Prehistoric Chronology for the Platte River Basin

<table>
<thead>
<tr>
<th>Cultural Component</th>
<th>Temporal Range</th>
<th>Identified Cultural Components on the PNG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paleoindian Stage</td>
<td>12,000-7690 B.P.</td>
<td>2</td>
</tr>
<tr>
<td>Clovis Period</td>
<td>12,000-11,000 B.P.</td>
<td>1</td>
</tr>
<tr>
<td>Folsom Period</td>
<td>13,290-10,670 B.P.</td>
<td>1</td>
</tr>
<tr>
<td>Plano Period</td>
<td>12,800-7690 B.P.</td>
<td>0</td>
</tr>
<tr>
<td>Archaic Stage</td>
<td>7500-1800 B.P.</td>
<td>5</td>
</tr>
<tr>
<td>Early Archaic Period</td>
<td>7500-5000 B.P.</td>
<td>0</td>
</tr>
<tr>
<td>Middle Archaic Period</td>
<td>5000-3000 B.P.</td>
<td>15</td>
</tr>
<tr>
<td>Late Archaic Period</td>
<td>3000-1800 B.P. (A.D.150)</td>
<td>23</td>
</tr>
<tr>
<td>Late Prehistoric Stage</td>
<td>800-360 B.P. (A.D. 150-1540)</td>
<td>23</td>
</tr>
<tr>
<td>Early Ceramic Period</td>
<td>1800-800 B.P. (A.D. 150-1150)</td>
<td>19</td>
</tr>
<tr>
<td>Middle Ceramic Period</td>
<td>800-360 B.P. (A.D. 1150-1540)</td>
<td>6</td>
</tr>
<tr>
<td>Protohistoric Period</td>
<td>360-90 B.P. (A.D. 1540-1860)</td>
<td>11</td>
</tr>
</tbody>
</table>

Derived from (Gilmore et. al. 1999)

**Historic Overview**

*The Open Range*

The first cattle drive from Texas to what would become Colorado occurred around 1859. In the 1860s Cattlemen or cattle “barons” would purchase Texas cattle at low prices and drive them north to Colorado and Nebraska where they could fetch higher prices. The cattlemen and the cowboys they hired grazed for free on public domain lands often fencing public domain lands and guarding the water sources with line camps. The need for cattle was being fed by the large demand of the booming mining development in the Colorado Rockies. Cattle Barons like John Wesley Iliff and John Wesley Prowers turned the cattle drives and grazing on public lands into large, lucrative, and influential industry. The drives became less profitable in the 1890s when cattle prices dropped and homesteaders were beginning to populate the area. The homesteaders were aided by congressional actions and an increase in sheep grazing in Weld County (Mehls 1984; Mehls and Mehls 2006; Ubbelohde 2006).

*Homesteading*

The earliest homesteading on and around the Pawnee National Grasslands slowly followed the designation of Colorado Territory in 1861 and the Homestead Act of 1862. Initial settlement of the area was slow during the period of the Civil War (Mehls and Mehls, 2006).

The Bureau of Land Management (BLM) Government Land Office Records indicate that the first settlers to the area purchased land parcels or used military scrip as authorized by the Scrip Warrant Act of 1855. The first homesteading occurred around 1891, but was slow to develop due to the arid condition of the lands that would later become the Pawnee National Grassland (BLM 2013). The arid condition of the lands was exasperated by the 1890s Colorado drought.

In the early 1900s beet farming was taking off west of the Pawnee National Grasslands alongside increasing water development projects. A beet boom was taking place by 1905 in the irrigated areas along the railroad in communities like Greeley, Eaton, Ault and Pierce (Holleran 2005). A rush of homesteaders to the grasslands occurred in 1909 and 1910 that coincided with unusually wet conditions, boosters that promoted development, and the enactment of the Enlarged
Homestead Act of 1909, which allowed for patents of 320 acres in size to allow for dryland farming rather than the 160 acre parcels allowed for in the 1862 Homestead Act (Mehls and Mehls 2006; Koenig 1979; BLM 2013).

The early homesteads met the requirements to prove up their claim with sod homes or vernacular structures, small outbuildings and wells. The railroad expansion that connected the communities of Sligo, Stoneham, Buckingham, Keota, Grover and other small towns to the resources in Cheyenne and larger Colorado Towns made it possible to obtain better building materials and build more, larger, and better built structures.

Homesteading in northeastern Weld County continued in high numbers through the 1920s. Congress spurred additional land patents by the enactment of the Stock Raising Homestead Act of 1916 which allowed for 640 acre parcels on arid lands for stock raising. Wartime needs during World War I also spurred development of marginal lands in northeastern Weld County. Existing Farms were not meeting demands and crop prices were rising.

*The Great Depression and the National Grasslands*

Although the land that became the Pawnee National Grassland was not part of the federally-designated Dust Bowl, the drought and economic depression of the 1930s had devastating effects on the marginal land farmers of Weld County, Colorado. The early 1930s saw several extremely dry seasons in northern Colorado. The homesteaders of the Great Plains had largely settled on “sub-marginal” land that was poorly suited for farm crops and had been living in poverty long before the 1929 stock market crash. Many newly unemployed factory workers had left cities during the early years of the Depression to attempt to make a living farming. Not only did the drought cause crops to fail, but removal of the native prairie vegetation and tillage of the dry soil made this marginal agricultural land extremely dry and unstable. In 1932 and 1933 the drought was accompanied by dry winds that churned up the loose dry soil and carried it away in dust storms.

In response to the high number of farm foreclosures and tax delinquencies, the federal government launched a land utilization program to purchase and develop sub-marginal land. This program eventually evolved into the Bankhead-Jones Farm Tenancy Act of 1937. A total of 11.3 million acres of land were acquired under these programs for an average of $4.40 per acre. The acquired land was planted with grasses and trees, improved with flood and erosion control features, or used for roads, employing a great number of people at the same time that the land was improved. These lands changed agencies many times before finally being designated as National Grasslands in 1960(Olson 1997).

*Existing Condition*

The existing condition of cultural resources on the PNG is constantly changing. Continued archaeological inventories and discoveries increase the knowledge base for cultural resources. The broader knowledge base allows resources to be better evaluated for significance and put into a more refined historic and prehistoric context. At the same time that the resource knowledge base is augmented by continued research and documentation it is also being diminished by human and natural processes. Unauthorized collecting, theft, excavations, and vandalism occur now and will continue. Natural erosional and depositional processes will also degrade heritage resources. Land and resource management associated with recreation, oil and gas development, agriculture, and grazing are on-going. The projects associated with the land
management activities have the potential to affect historic properties. Thirty percent of the PNG has been surveyed for cultural resources and approximately 2000 cultural resources have been identified, approximately 300 of those are considered to be historic properties eligible for the NRHP. The number of identified cultural resources is expected to increase and increase the number of resources that should be preserved, interpreted for the public, maintained, and documented.

Oil and gas development has the potential to directly impact cultural resources by causing physical destruction, damage, or loss of critical information about prehistoric and historic life during construction of wells, access roads, pipelines and other activities associated with oil and gas development. Oil and gas development also has the potential to impact the setting and visual landscape of cultural resources. Oil and gas development accessing federally owned mineral estates are subject to authorization and consideration of cultural resources through the NEPA and NHPA section 106 processes. Lease terms that are intended to minimize or remove potential impacts to cultural resources are applied when accessing federal oil and gas leases on Federal lands and private lands. Additional lease terms may also be applied to development of federally owned mineral estates where development takes place on federal lands. The existing impacts from oil and gas leasing accessing federal estates are restricted mostly to visual impacts to the setting cultural resources. Direct impacts are avoided or mitigated.

Privately owned mineral estates are not subject to federal authorization when development takes place on private lands. There are likely ongoing direct irreversible impacts to cultural resources on private lands accessing private mineral estates. The loss of cultural resources and archaeological information diminishes the understanding of past human behavior.

Case law and regulations been inconsistent on the ability of federal agencies to carry out environmental and cultural resource reviews for privately owned mineral estates where development will take place on federal lands (Williams 2011; Minard Run Oil Co. v. U.S. Forest Service; Minard Run Oil Co. v. U.S. Forest Service; San Luis Valley Ecosystem Council v. U.S. Fish and Wildlife Service). For a reserved private mineral right underlying National Forest System (NFS) lands the Forest Service does issue an authorization that triggers cultural resource review and consideration. For outstanding mineral rights underlying NFS lands the Forest Service may only have 60 days to respond to requests to access the underlying minerals and may not be able to give full consideration to cultural resources. The Archaeological Resources Protection Act (ARPA) does provide penalties for damaging archaeological resources. There are incentives for mineral estate owners, lease holders, and oil and gas development companies to avoid damaging cultural resources on Federal lands. In most cases consideration of cultural resources will take place for development of both reserved and outstanding mineral rights, although the authority to carry out reviews that could delay the mineral estate owner from development is currently unclear.

**Desired Condition**

The desired conditions for cultural resources is that they remain stable, intact, and the characteristics which make them eligible for the NRHP remain unaltered by future projects, neglect, forest visitors, or natural processes. Cultural resources should continue to provide interpretation opportunities to increase public understanding, appreciation, and perspective of our diverse heritage and provide opportunities for scientific and cultural study to gain knowledge about past human behavior.
Environmental Consequences

Methodology

Incomplete and Unavailable Information

The current knowledge base regarding heritage resources in the study area derives from archaeological surveys totaling 56,800 acres (30% of the PNG). A total of 35,002 acres (approximately 24%) of previous archaeological surveys have taken place on the lands currently being analyzed for a leasing decision (146,367 acres). In addition to a lack of knowledge of the resources in about three quarters of the analysis area, sites that were previously determined not eligible for the NRHP may need to be re-evaluated within the context of the current knowledge base. Periods and areas of historical and prehistoric significance can change over time. Recording and data recovery methods can also change over time. The value and significance of resources may have increased or decreased since previous recordings. A number of lithic procurement or prehistoric stone quarry resources, larger than can be protected by the SLT stipulations, have been identified in the last decade on the west unit of the PNG. The FS and SHPO started addressing some landscape level approaches to recording these resources but may also need to address some landscape level management approaches to minimize or remove the potential for adverse effects to these resources. Given that only around a quarter of the analysis area has been inventoried it is likely that additional larger lithic procurement resources will be identified within the analysis area.

Spatial and Temporal Context for Effects Analysis

Summary of Cultural Resources within the APE of the Current Oil and Gas Leasing Analysis

Sites were considered to be within the APE of the current analysis if they fully encompassed or exceeded a forty acre Public Land Survey System (PLSS) legal land parcel within the area proposed for a leasing decision, or could potentially be adversely affected by changes to the integrity elements of setting or feeling of the resource. Sites, smaller than a forty acre PLSS land parcel, can be protected from potential ground disturbing activities using the SLT stipulations. Sites that can be protected using the SLT, have been determined to be not eligible for the National Register of Historic Places, or are outside of the areas currently being proposed for a leasing decision have been excluded from the following summary.

Fifteen sites within the analysis area are greater than 40 acres in size and could potentially be physically impacted by the leasing decision. However an analysis of existing leases in and around the PNG administrative area indicates that all of the previous leases follow the PLSS legal land description boundaries (sections, quarter sections; quarter, quarter sections; etc.). BLM data indicates that only four leases were less than 40 acres and 49.5% were right at 40 acres (the rest were also standard sizes: 80 acres – 22%, 160 acres -15%, 320 acres – 10%, and 640 acres – 2%). The forty acre lease size seems to be the smallest and most predominant. Four cultural resources fully encompassed or exceeded a forty acre parcel and could not be fully protected by SLT stipulations.
For the purposes of the analysis the direct and indirect effects APE were determined by following the directives in 40 CFR 1508.8, 36 CFR 800.16 and the Council on Environmental Quality (CEQ), Executive Office of the President, and the Advisory Council on Historic Preservation (ACHP) Handbook for integrating NEPA and Section 106 of the National Historic Preservation Act (CEQ et. al., 2013:41).

**Cultural Resources in the Direct Effects APE**

Physical destruction or damage could impact these resources. Alterations to the integrity elements of materials, design, workmanship, or location could impact these resources.

Site **5WL2180** is the West Stoneham Archaeological District and management area 3.1 Special Interest Area. The site encompasses 440 acres and contains 44 documented sites representing 10,000 years of human occupation. The district includes rock shelters, stone ring camps, animal and plant processing locales, lithic quarries and lithic manufacturing sites and areas. The site is associated with Middle Paleo-Indian, Early Archaic, Middle Archaic, Late Archaic, Plains Woodland, Upper Republican, Dismal River and, Historic American Indian populations. This site is listed on the National Register of Historic Places. Due to the size of 5WL2180 the SLT are not sufficient to protect it from potential adverse effects from oil and gas leasing. The 1997 Forest Plan determined that the West Stoneham SIA should be subject to the NSO supplemental stipulation for oil and gas leasing.

Site **5WL1470** is a large prehistoric open lithic and open camp site. Across the entire site area (370 acres), it is estimated that there are over 2500 flakes and nearly 400 early stage bifaces, cores or tested raw material (TRM) are present. Four concentrations of fire affected rock were recorded within the site. A buried basin hearth was recorded in an exposed cutbank at the site. Black-stained sediments, charcoal, bone, debitage, and FCR are visible within the feature buried hearth feature. The site has yielded and is likely to yield additional information important to prehistory. Site 5WL1470 is eligible for the NRHP. Due to the large size of 5WL1470 the SLT are not sufficient to protect it from potential adverse effects from oil and gas leasing. The site is considered to be within the APE of the current oil and gas leasing analysis.

Site **5WL5732** is a very large lithic procurement site and lithic scatter. The site occupies a 190 acre area. Samples of the artifacts observed at the site were recorded. The samples included 1101 flakes and 403 cores and tested cobbles. Of the 1101 flakes recorded 839 were cortical flakes. Eight expedient bifacial tools and three expedient unifacial tools were recorded. The material types represented consist primarily of quartzite and chert and a very small number of chalcedony flakes. The site has yielded and is likely to yield additional information important to prehistory. Site 5WL5732 is eligible for the NRHP. Due to the large size of 5WL5732 the SLT are not sufficient to protect it from potential adverse effects from oil and gas leasing. The site is considered to be within the APE of the current oil and gas leasing analysis.

Site **5WL8** is a stone quarry. The site consists of an extensive scatter of lithics of varying density over the crest of a ridge overlooking the head of Howard Creek. Lithic materials are present in noticeable concentrations, are quite sparse in some areas, but are continuous over at least 90 acres. Several thousand artifacts were noted at the site; these included cobble source material of chert and quartzite, cores, flakes, and utilized flakes. The last recorder of the site recommended that the site should monitored, protected, and that the potential for subsurface deposits be determined. The site is unevaluated for the NRHP.

**Cultural Resources in the Indirect Effects APE**
Alterations to the integrity elements of setting, character, or feeling could impact these resources.

Site **5WL1591** is the Land Utilization Program Headquarters (LUP HQ). The site consists of a 1920s era homestead that was used as the headquarters for the Land Utilization Program from 1936 to 1941. The LUP HQ is the most intact surviving site tied to the work of the Resettlement Association (RA), Soil Conservation Service (SCS), and Farm Security Administration (FSA) in the region. The site contains several buildings and significant landscape architecture elements. The LUP HQ is associated President Franklin Roosevelt’s New Deal legislative agenda to rescue the United States from the Great Depression. The New Deal programs carried out from the LUP HQ are representative of major shifts in government policy relating to land use and agriculture. After decades of encouraging settlement of the plains and giving away land through the Homestead Acts, under the Resettlement Administration the government began to buy back land it determined unsuitable for farming. These New Deal agencies marked the beginning of much greater government involvement in agricultural practice and policy including loans, subsidies, educational programs, and controlled grazing on government lands. The site is eligible for its association with significant historical events in the areas of Conservation, Politics/Government, and for unique landscape architecture elements. The site is listed on the NRHP.

Site **5WL2413** is the Main Stone Circle Site. The site consists of twenty seven stone circles ranging from 3-6 meters in diameter spread along the western edge of a bluff on a northwest – southeast trending broad ridge. The site occupies a 450m (NW-SE) x 150m (NE-SW) area. Eleven flakes and three cores were observed scattered throughout the site, material types include chalcedony, quartz and chert. Eight of the stone circle features contained fire affected rock or other evidence of a hearth being present. Two hearths unassociated with any stone circle features were observed. The site is eligible for the NRHP.

Site **5WL3169** is the Vim Stone Circle Site. The site consist of 45 complete stone circles, 8 additional partial stone circle features, and a several hearth features. The site is eligible for the NRHNP. Visual impacts from a wind farm adjacent to the lands managed by the PNG have already partially diminished the integrity elements of setting, character and feeling of this resource.

Site **5WL2658** is a prehistoric site that contains 27 stone circles and a lithic scatter. The site is eligible for the NRHP.

Site **5WL2859** is the possible location of the May 2, 1864 Battle of Cedar Creek, the first military engagement between organized American forces and Native Americans in Colorado (Noisat 1999). The site is eligible for the NRHP. (This site has significant value to the Northern Arapaho and Northern Cheyenne)

Site **5WL27** is the Biggs Site an open architectural site recorded in 1964. This site has also been associated with the May 2, 1864 Battle of Cedar Creek. The site includes one stone circle, 33 pottery fragments, 11 grinding stones, 17 projectile points, 2 blades, one drill, and lithic flakes. The site dates from B.P. 1400 ± 90 (Late Prehistoric) to 1864 (Wood, 1967, Noisat 1999).

Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

There are ongoing impacts to cultural resources within and adjacent to the analysis area. Human impacts and natural processes are constantly affecting cultural resources. Activities such as
hunting, dispersed recreation, agriculture, oil and gas development on adjacent lands, and grazing are on-going and may impact cultural resources by causing physical damage, increasing illegal collection and vandalism, or affecting the setting and character of cultural resources.

Cultural resources are non-renewable. The loss of archaeological resources has occurred in the past and will continue to occur in the future through both natural and human causes. The accumulated loss of individual cultural resources has the potential to limit our ability to understand broad patterns of human history as well as local historical events. Over time, fewer cultural resources would be available for study and interpretation.

Oil and gas development has the potential to directly impact cultural resources by causing physical destruction, damage, or loss of critical information about prehistoric and historic life during construction of wells, access roads, pipelines and other activities associated with oil and gas development. Oil and gas development also has the potential to impact the setting and visual landscape of cultural resources. Oil and gas development accessing federally owned mineral estates are subject to authorization and consideration of cultural resources through the NEPA and NHPA section 106 processes. Lease terms that are intended to minimize or remove potential impacts to cultural resources are applied when accessing federal oil and gas leases on Federal lands and private lands. Additional lease terms may also be applied to development of federally owned mineral estates where development takes place on federal lands. The existing impacts from oil and gas leasing accessing federal estates are restricted mostly to visual impacts to the setting cultural resources. Direct impacts are avoided or mitigated.

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Case law and regulations been inconsistent on the ability of federal agencies to carry out environmental and cultural resource reviews for privately owned mineral estates where development will take place on federal lands (Williams 2011; Minard Run Oil Co. v. U.S. Forest Service; Minard Run Oil Co. v. U.S. Forest Service; San Luis Valley Ecosystem Council v. U.S. Fish and Wildlife Service). For a reserved private mineral right underlying National Forest System (NFS) lands the Forest Service does issue an authorization that triggers cultural resource review and consideration. For outstanding mineral rights underlying NFS lands the Forest Service may only have 60 days to respond to requests to access the underlying minerals and may not be able to give full consideration to cultural resources. The Archaeological Resources Protection Act (ARPA) does provide penalties for damaging archaeological resources. There are incentives for mineral estate owners, lease holders, and oil and gas development companies to avoid damaging cultural resources on Federal lands. In most cases consideration of cultural resources will take place for development of both reserved and outstanding mineral rights, although the authority to carry out reviews that could delay the mineral estate owner from development is currently unclear.

**Alternative 1 – No Leasing**

This alternative proposes that all lands in the project area will not be available for leasing whatsoever. Stated simply, the projection is zero with no new leases issued on these lands. Lands already leased would continue under their terms—approximately 43,398 acres.
Direct Effects
Under the No Leasing Alternative there would be no direct effects to cultural resources within the analysis area.

Indirect Effects
Under the No Leasing Alternative there is potential that oil and gas development would increase on lands adjacent to the current analysis area (Federal lands previously leased, State lands, and Private lands). The potential for the increased development to be is not expected to be measurably different than the current RFD scenario. Development in the area is not expected to decrease and the logistics of avoiding federal the mineral estate no leased is likely to increase the disturbance on adjacent lands. Since much of this development would be taking place on private surface to access private mineral estates where cultural resources will not be considered prior to development there could be significant impacts under the no leasing alternative.

Cumulative Effects
The No Leasing alternative the indirect impacts and the impacts of other projects, looting, vandalism, erosion and other factor would combine to create significant and adverse impacts to cultural resources.

Summary of Effects
The No Leasing Alternative would have no direct impacts to cultural resources on Forest Service System lands, but could have significant and adverse indirect and cumulative impacts to cultural resources.

Alternative 2 – No Action
The No Action Alternative proposes that all lands in the project available for leasing in the 1997 Forest Plan ROD would remain available for leasing—approximately 146,367 acres. Lease stipulations determined in the 1997 Forest Plan ROD would be required on any new leases. The stipulations in the 1997 Forest Plan included several areas of No Surface Operations (NSO), Timing Limitations (TL), and Standard Lease Terms. Appendix D of the 1997 Forest Plan contains a description and location of the leasing stipulations.

Design Features and Mitigation Measures
Alternative 2 includes one NSO area to specifically design to cultural resources from the impacts of oil and gas leasing activities.

Alternative 2 includes a number of other stipulations (Timing Limitations, Controlled Surface Use, No Surface Occupancy Areas, No Leasing Areas and Standard Leasing Terms) designed specifically for other resources that will also protect cultural resources.

Direct Effects
Under the No Action alternative there could be potential direct effects to resources that were not identified prior to the 1997 Forest Plan decision or any resource that is too large to be protected by SLTs. There are four cultural resources (5WL8, 5WL1470, and 5WL5732) where the SLTs are not sufficient to reduce or remove potential significant impacts from oil and gas leasing and
mineral development. These sites are larger than the standard lease size (40 acres) and moving mineral development activities 200 meters would not remove the potential for significant impacts. Oil and gas drilling, road building, installation of pipelines, and other oil and gas development activities could cause physical destruction or damage to all or part of the resources. Oil and gas development and related activities could also cause alterations to the integrity elements of materials, design, workmanship, or location.

Three of the sites (5WL1470, 5WL5732, and 5WL8) are large lithic procurement sites. These resources have large spatial extents but only small portions of the site support their eligibility. The current lease stipulations could be applied to remove potential adverse effects to these sites in consultation with SHPO.

Under Alternative 2 there is the potential for significant impacts to cultural resources.

**Indirect Effects**

Under the No Action alternative there is the potential for indirect effects to cultural resources. Oil and gas development activities could alter to the integrity elements of setting, character, or feeling could impact these resources. Oil and gas development could change the visual or audible setting and cause significant impacts to cultural resources.

For the purposes of this analysis cultural resources with architectural elements and areas and resources that could be important to tribes were considered for potential impacts from visual and audible alterations from oil and gas development. There is one historical cultural resource on the PNG with intact standing architecture, 5WL1591, the LUP project headquarters, this site and the area around it are used as an administrative site and were made No Leasing by decision in the 1997 forest plan. Since this site is protected be the No leasing stipulation significant impacts would not occur due oil and gas leasing activities.

Three prehistoric sites that contain large concentrations of stone circles (5WL2413, 5WL3169, and 5WL2658) were identified that could be impacted by the indirect effects of oil and gas leasing activities within the analysis area.

A viewshed analysis was run in ArcGIS on all three of these resources. For 5WL2413 and 5WL2658 the SLT stipulations that allow moving leasing activities 200 meters would be able to remove the potential for indirect effects to the site. The viewshed analysis run for site 5WL3169 indicated that there could be areas where SLTs would not be sufficient to remove potential indirect visual effects; however the setting at 5WL3169 has already been heavily impacted by the a wind farm on adjacent private lands and the site does not retain integrity of setting or feeling. 5WL3169 also would retain numerous other charter defining features (information potential, integrity of design, location, materials, and workmanship) that would still support the eligibility of the resource.

Two sites (5WL2859 and 5WL27) in the Indian Caves area have been associated with the May 2, 1864 Battle of Cedar Creek, the first military engagement between organized American forces and Native Americans in Colorado. Sites 5WL2859 and 5WL27 are within areas identified as NSO due to recreation and scenery objective concerns. These two resources would not be indirectly affected by potential indirect effects of oil and gas leasing.
Cumulative Effects
Under the No Action Alternative there is potential for cumulative effects to cultural resources. Under the No Action alternative the current analysis identified the potential for direct effects to sites 5WL8, 5WL1470, and 5WL5732 and the potential for indirect effects at 5WL3169. The potential direct effects to 5WL8, 5WL1470, and 5WL5732 combined with other ongoing human and natural impacts could create a significant and irretrievable loss of archaeological information, and damage the character defining features and integrity of cultural resources. The accumulated loss of individual cultural resources has the potential to limit our ability to understand broad patterns of human history as well as local historical events.

Under alternative 2 there is the potential for significant cumulative effects to cultural resources.

**Alternative 3 – Leasing under No Surface Occupancy (NSO)**

Leasing under NSO proposes that all lands in the project area determined as administratively available for leasing under the 1997 ROD would continue to be available for leasing—approximately 146,367 acres. On these lands the Forest Service would require a No Surface Occupancy stipulation. The NSO stipulation would prohibit occupancy and use of the surface for oil and gas operations. The projection for these lands would be zero because no wells or well pads would be allowed. Although the NSO stipulations would be applied to these lands, the NSO stipulation does not prohibit oil and gas from being leased in these areas. If these lands were leased with an NSO stipulation, oil and gas could be extracted by locating facilities on non-NFS lands and horizontally drilling underneath the surface.

**Design Features and Mitigation Measures**

A supplemental NSO stipulation would be added to Alternative 4 for protection of resources on the entire analysis area.

**Direct Effects**

Under Alternative 4 the design features of the alternative could remove any significant direct effects to historic properties within the analysis area. The entire analysis area would be protected from ground disturbing activities. The potential for destruction or damage to all or part of the historic properties within the Analysis area would be removed by removing oil and gas development activities from the analysis area.

The design features of Alternative 4 would protect cultural resources from direct effects. There would not be any significant direct impacts to cultural resources under Alternative 4.

**Indirect Effects**

The RFD scenario would still apply and development would be expected to occur on the private lands adjacent to the project area. There could be increased development on lands adjacent to the PNG to access the oil and gas leased under the federal surface through horizontal drilling. However the Bureau of Land Management (BLM) is also required to take cultural resources into consideration through the NEPA and Section 106 process when oil and gas development proposals are considered on private lands to access federal mineral resources (BLM 2008).

Since the BLM would be required by NEPA and the NHPA section 106 process to consider the effects to cultural resources there would not be any significant indirect impacts to cultural resources under alternative 4.
Cumulative Effects
Alternative 4 would have no direct or indirect effects and that could combine with past, present, or reasonably foreseeable future actions to create cumulative effects.

Regulatory Framework

Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

The statutory basis and general US Forest Service guidance for the management of heritage resources are presented in Forest Service Manual, Chapter FSM 2360, Heritage Program Management. The following list of cultural resource laws, executive orders, and regulations was derived from the Forest Service Manual Sections 2360.1, 2360.11, 2360.12 and 2360.13 (Forest Service, 2008). A more comprehensive summary of the laws, regulations, executive orders and regulations can be found within the Forest Service Manual.

Laws

- Organic Act of 1897
- Antiquities Act of 1906
- Historic Sites Act of 1935
- National Historic Preservation Act of 1966
- National Environmental Policy Act of 1969
- The Archeological and Historic Preservation Act of 1974
- Federal Land Policy and Management Act of 1976
- National Forest Management Act of 1976
- Archaeological Resources Protection Act of 1979
- Native American Graves Protection and Repatriation Act of 1990

Executive Orders

- Executive Order 11593 - Protection and Enhancement of the Cultural Environment
- Executive Order 13007 - Indian Sacred Sites
- Executive Order 13175 – Consultation and Coordination with Indian Tribal Governments
- Executive Order 13287 – Preserve America
- Executive Order 13327 – Federal Real Property Asset Management,

Regulations

- Protection of Historic Properties (36 CFR part 800).
- National Register of Historic Places (36 CFR part 60).
- Protection of Archaeological Resources Uniform Regulations (36 CFR part 296).
- Native American Graves Protection and Repatriation Regulations (43 CFR part 10)
- Planning (36 CFR part 219)

Policy Guidance

The Forest Service Manual (FSM) provides policy guidance in line with the statutory authorities previously summarized. The USDA, Forest Service, Region 2 has also provided supplemental policy guidance specifically related to cultural resources and mining and mineral leasing in
sections 2820 and 2361.03 (Forest Service, Region 2, 1994). The policy guidance provides the statutory and financial roles and responsibilities of both the Forest Service and the mining and mineral leasing operators and provides methods for disclosure of the roles and responsibilities to the permittee/lessee (Form R2-FS-2820-13).

Forest Plan

Goals and Objectives

The 1997 Forest Plan does not identify any specific goals and objectives related to cultural resources. The Final Environmental Impact Statement (FEIS) to accompany the 1997 Revised Land and Resource Management Plan does identify four goals for the heritage program:

1. Provide interpretation to increase public understanding, appreciation, and perspective of our diverse heritage
2. Provide opportunities for scientific study to gain knowledge about past human behavior and about past environments relevant to present and future ecosystem management.
3. Inventory resources and prevent loss or damage until they can be evaluated for significance and appropriate uses
4. Nominate significant sites to the NRHP

The goals outlined in the FEIS for the 1997 Forest Plan are consistent with the policy guidance in the Forest Service Manual and existing statutory authorities.

Management Activities-General Direction

General and specific direction regarding cultural resources Forest activities can be found in the 1997 Forest Plan under the section on Special Interest Areas. The general direction provided relates to Management Area 3.1 and states: “Special Interest Areas (SIAs) are managed for public education, interpretation, recreation or development while protecting or enhancing areas with unusual characteristics.”

Management Area 3.1 Special Interest Areas

West Stoneham Archaeological District SIA 3.1:
This area was placed on the National Register of Historic Places in 1995. Significant evidence of Native American habitation from 8,500 years ago to the mid 1800s occurs in this shortgrass prairie area of the Pawnee National Grassland. Management emphasis is on protecting and interpreting the nonrenewable heritage resources (Forest Service 1997:352).

Standards and Guidelines

Forest Plan Standard (ST): Withdraw this area from mineral entry in conformance with Section 204 of Federal Land Policy and Management Act of 1976 (PL 94-579) when withdrawal is necessary to protect the values for which the SIA was designated.

Other Forest Plan Guidance
Appendix D of the 1997 Forest Plan also provides a summary of lease stipulations. This includes the both Standard Lease Terms (SLT) required by the BLM (Form 3100-11) and the Forest Service (FS form 2820-13) and supplemental stipulations made as a result of the leasing analysis for the 1997 Forest Plan. Under SLTs, development may be delayed for up to 60 days and/or the activities moved 200 meters. The SLT are intended to protect cultural resources less than 400 meters across or less than 40 acres.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

**Alternative 1:** This alternative would not comply with the Forest Plan, Laws Regulations and Policy. Development on of private mineral estates and existing leased federal mineral estates is still expected to take place. Avoidance of the unleased mineral estates could increase the complexity and disturbance of oil and gas development in the area. Significant and adverse indirect and cumulative impacts are likely to occur due to the increased development.

**Alternative 2:** This alternative would not comply with the Forest Plan, Laws, Regulations or Policy. Direct (physical destruction or damage) and indirect (alterations to the setting, and visual landscape) impacts could adversely affect cultural resources.

**Alternative 3:** This alternative would comply with the Forest Plan, Laws Regulations and Policy. The NSO stipulation would protect cultural resources from indirect effects. BLM cultural resource review of spit estate oil and gas development project would protect cultural resources from indirect effects.

Other Relevant Mandatory Disclosures
The significant impacts identified in Alternatives 1 and 2 could result in irretrievable/irreversible effects and would not be in compliance with a number of laws and regulations.

Summary of Effects
Through the consideration of effects to cultural resources in the current analysis the Forest Service feels the following findings of effect are appropriate:

**Alternative 1:** The Forest Service feels a finding of significant impacts to cultural resources is appropriate for Alternative 1. The analysis of the no leasing alternative identified potential significant indirect and cumulative impacts to cultural resources.

**Alternative 2:** The Forest Service feels a finding of significant impacts to cultural resources is appropriate for alternative 2. Potential direct effects were identified for 5WL1470, 5WL5732, and 5WL8 and potential indirect effects were identified for 5WL3169.

**Alternative 3:** The Forest Service feels a finding of no significant impacts to cultural resources is appropriate for alternative 4. No direct, indirect, or cumulative effects were identified in the Analysis for the no surface occupancy alternative. All of the resources considered in this analysis would be protected from ground disturbing
activities under the NSO stipulation. The BLM is also required to take cultural resources into consideration through the NEPA and Section 106 process when oil and gas development proposals are considered on private lands to access federal mineral resources (BLM 2008).

Table 4: Summary of Potential Impacts to Previously Recorded Cultural Resources by Alternative

<table>
<thead>
<tr>
<th>Resource Component</th>
<th>Alternative 1: No Leasing</th>
<th>Alternative 2: No Action</th>
<th>Alternative 3: NSO</th>
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