

**U.S. Department of the Interior
Bureau of Land Management**

**Environmental Assessment
NCRU 14-29 APD and ROW**

December 2015

PREPARING OFFICE

U.S. Department of the Interior
Bureau of Land Management
Worland Field Office



Environmental Assessment

NCRU 14-29 APD and ROW

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Chapter 1. Introduction

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1.1. Identifying Information

1.1.1. Title, EA number, and type of project:

Title:

NCRU 14-29 APD and ROW

EA Number:

DOI-BLM-WY-R010-2016-0002-EA

1.1.1.1. Type of Project:

Application for Permit to Drill 1 oil well and Associated Access Road Right-of-way

1.1.2. General Location of Proposed Action:

Well location: T. 46 N., R. 96 W., sec. 29

6th P.M., Washakie County, Wyoming

Access road:

T. 46 N., R. 96 W., secs. 32

T. 45 N., R. 96 W., secs. 5, 8, and 17

6th P.M., Washakie County, Wyoming

1.1.3. Name and Location of Preparing Office:

Worland Field Office

101 S. 23rd St.

Worland, WY 82401

1.1.4. Lease/Serial/Case file number:

Lease: WYW175700

Unit: WYW184197X

ROW Case file: WYW165340, WYW165340-01

1.1.5. Applicant Name:

Foreland Resources, LLC

1.1.6. Background Information:

Foreland Resources, LLC (Foreland) proposes to drill within their lease. The proposed well is located on public lands within the administrative boundary of the Worland Field Office in SWSW section 29, T46N, R96W; Washakie County, Wyoming.

This EA incorporates the Application for Permit to Drill (APD), and the associated access, for the proposed action of drilling one well, as associated with Oil & Gas lease WYW175700, access Right-of-way WYW-165340 and construction Right-of-way WYW-165340-01.

1.1.7. Purpose and Need for Action:

The Proposed Action allows the leaseholder to explore for, test the feasibility of future development, and develop oil and gas resources. The need for the action is established by the BLM's responsibility under FLPMA to respond to this type of request.

The need for the right-of-way action is established by the BLM's responsibility under Title V of the Federal Land Policy and Management Act of 1976 (FLPMA) to respond to requests for rights-of-way (ROW) grants and to ensure the activity protects the natural resources of public lands and prevents unnecessary or undue degradation. The purpose of the proposed action is for the BLM to respond to the request.

1.2. Decision to be Made:

The Authorized Officer (AO) must determine whether or not to approve the APD and grant access across public lands. The AO could decide not to issue a permit if it would cause unnecessary or undue degradation to the public lands, or if it would threaten to violate another Federal law.

If it is decided to issue the permit, the AO must decide what Conditions of Approval, would apply to the permit. Conditions of Approval could include specification of construction, drilling, production and abandonment activities for the proposed project area.

If it is decided to issue the right-of-way, the AO must decide what Terms and Conditions would apply to the grant. Terms and Conditions could include specification of construction, operation and abandonment activities for the proposed project area.

1.3. Conformance:

This plan has been reviewed to determine if the proposed action conforms to the land use plan as required by 43 CFR 1610.5. The proposed action conforms to the Record of Decision and Approved Resource Management Plan for the Worland Field Office, dated September 21, 2015. The decisions in the Worland Resource Management Plan (WRMP) provide general management direction and allocation of uses and resources on the public lands in the area.

The Worland RMP (pgs 61 - 63) addresses oil and gas leasing and development. The Worland RMP states that the BLM would manage leasable fluid mineral resources (oil, gas, CBNG, geothermal) in the planning area to meet the Nation's energy needs, without compromising long-term health and diversity of public lands and resources, and avoiding or mitigating impacts

on other resources. BLM will provide opportunities to explore and develop federal oil and gas resources and other leasable minerals.

Where a proposed fluid mineral development project on an existing lease could adversely affect Greater Sage-Grouse populations or habitat, the BLM will work with the lessees, operators, or other project proponents to avoid, reduce, and mitigate adverse impacts to the extent compatible with lessees' rights to drill and produce fluid mineral resources. The BLM will work with the lessee, operator, or project proponent in developing an APD for the lease to avoid and minimize impacts to Greater Sage-Grouse or its habitat and will ensure that the best information about the Greater Sage-Grouse and its habitat informs and helps to guide development of such federal leases.

The Worland RMP (pgs 107-109) delineates right-of-way corridors, right-of-way avoidance areas, right-of-way exclusion area, and areas available for right-of-way. The Worland RMP states that the BLM would manage public lands to meet transportation and ROW needs by providing opportunities to meet ROW demands while protecting important resources.

1.4. Relationship to Statutes, Regulations, Plans or Other Environmental Analysis:

This Environmental Assessment (EA) is prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA) and complies with applicable regulations and laws passed subsequent to the Act. In addition, this EA is prepared utilizing the stipulations and format outlined in the BLM NEPA Handbook H-1790-1 (BLM 2008). The Proposed Action and alternatives would comply with relevant federal, state, and local regulations, plans, and policies.

This drilling operation would allow the lessee to exercise their legal right to drill, explore, and produce hydrocarbons from the lease under regulations and policy derived from the Mineral Leasing Act. The Secretary of the Interior has entered into a lease agreement with the proponent that gives them the “exclusive right to drill for, mine, extract, remove and dispose of the oil and gas resources within the lease area.” The applicant has submitted a proposed action to the BLM to at least partially exercise their rights under this agreement, in accordance with 43 CFR 3162.3-1 and Onshore Oil and Gas Order No. 1.

Onshore Oil and Gas Order No. 1 (43 CFR 3164.1) requires that an APD provide sufficient detail to permit a complete appraisal of the technical adequacy of, and environmental effects associated with, the proposed project. The APD must be developed in conformity with the provisions of the lease, including the lease stipulations. The APD must provide for safe operations, adequate protection of surface resources and must include adequate measures for reclamation of disturbed lands. If the APD(s) are inadequate or incomplete, the applicant must modify or amend the APD(s). The BLM can set forth design features that are necessary for the protection of the surface resources, uses and the environment; and for the reclamation of the disturbed lands. For the purpose of this analysis, the design features for the APD are considered part of the Proposed Action and attached as Conditions of Approval.

This project does not fit any of the specified criteria allowing for Categorical Exclusion from NEPA analysis under Section 390 of the Energy Policy Act of 2005, and is therefore being analyzed herein.

Title V of FLPMA, Sec. 501. [43 U.S.C. 1761] (a) The Secretary, with respect to the public lands (including public lands, as defined in section 103(e) of this Act, which are reserved from entry

pursuant of section 24 of the Federal Power Act (16 U.S.C. 818)) [P.L. 102-486, 1992] and, the Secretary of Agriculture, with respect to lands within the National Forest System (except in each case land designated as wilderness), are authorized to grant, issue or renew rights-of-way over, upon, under, or through such lands for-(6) roads, trails, highways, railroads, canals, tunnels, tramways, airways, livestock driveways, or other means of transportation except where such facilities are constructed and maintained in connection with commercial recreation facilities on lands in the National Forests System:

43 Code of Federal Regulations § 2800. It is BLM's objective to grant rights-of-way under the regulations in this part to any qualified individual, business, or government entity and to direct and control the use of rights-of-way on public lands in a manner that:

1. Protects the natural resources associated with public lands and adjacent lands, whether private or administered by a government entity;
2. Prevents unnecessary or undue degradation to public lands;
3. Promotes the use of rights-of-way in common considering engineering and technological compatibility, national security, and land use plans; and
4. Coordinates, to the fullest extent possible, all BLM actions under the regulations in this part with state and local governments, interested individuals, and appropriate quasi-public entities.

The BLM Land Use Planning Handbook (H.1601-1) states that the BLM must consider the management of lands with wilderness characteristics during the land use planning process. The criteria used to identify these lands are essentially the same criteria used for determining wilderness characteristics for wilderness study areas (WSA). However, the authority set forth in Section 603(a) of FLPMA to complete the three part wilderness review process (inventory, study, and report to Congress) expired on October 21, 1993; therefore, FLPMA does not apply to new WSA proposals and consideration of new WSA proposals on BLM-administered public lands is no longer valid. The alternatives were evaluated and screened in accordance with FLPMA, Section 201.

1.5. Scoping, Public Involvement and Issues:

1.5.1. Scoping

The proposed action was reviewed by an interdisciplinary team. The Notice of Staking was received by the Worland Field Office May 5, 2015. In accordance with 43 CFR 3162.3-1 (g), the notice was made available to the public for comment for 30 days ending June 4, 2015. Notification of preparation of this EA was also provided on the Wyoming BLM internet NEPA register (<http://www.wy.blm.gov/nepa/search/index.php>) on October 7, 2015. There were no issues raised by the public during this review. It was determined that the nature of the action is routine and that further public notification would not be necessary. The APD and associated right-of-way was received by the Worland Field Office on August 6, 2015. Staff specialists reviewed the proposal and identified impacts and appropriate mitigation measures. The APD was considered complete on November 20, 2015.

1.5.2. Issues Identified

Cultural: How would the proposed surface disturbance affect cultural resources eligible or unevaluated for the NRHP?

Vegetation: How would the proposed APD and ROW effect upland vegetation meeting or not-meeting Rangeland Health Standard 3: Upland vegetation on ecological site consists of plant communities appropriate to the site which are resilient, diverse, and able to recover from natural and human disturbance?

Invasive, Non Native Species Noxious Weeds: How would the proposed project affect the introduction and spread of noxious weeds?

Recreation and Visual Resources Management:

How will the proposed action impact visual resources in Class III and IV VRM landscapes?

How will the proposed action impact the character of lands with wilderness characteristics unit 622 AK and the dispersed recreational opportunities of the area including hunting?

Soils: How would the proposed project affect runoff and erosion?

Water Resources: How would the installation of 15 culverts and two low water crossings impact surface water runoff in adjacent tributaries of Cottonwood Creek?

Wildlife: What impact will the proposed access route, well pad surface disturbance, vehicle traffic, and drilling disruption, have on wintering mule deer and sage-grouse, as well as avian sagebrush obligate nesting?

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Chapter 2. Proposed Action and Alternatives

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2.1. Description of the No Action Alternative:

With this alternative BLM would not approve the APD and the applicant would not be allowed to drill the proposed well. No action implies that on-going development and activities would be allowed to continue in the area, but the proposed action would be disallowed. Additional APD's and ROW actions would be considered by the BLM on a case-by-case basis. BLM's authority to implement the No Action Alternative may be limited because oil and gas leases allow drilling in the lease area subject to the stipulations of the specific lease agreement. BLM can deny the APD if the proposal would violate lease stipulations, applicable laws and /or regulations and also can impose restrictions to prevent undue or unnecessary environmental degradation. If BLM were to deny the APD, the applicant could attempt to reverse BLM's decision through administrative appeals, seek to exchange its lease for leases in other locations or seek compensation from the Federal government. The outcome of these actions is beyond the scope of this EA as they cannot be projected or meaningfully analyzed at this time.

2.2. Description of the Proposed Action:

This EA incorporates the APD and the associated access for the proposed action of drilling one well, as associated with Oil & Gas lease WYW175700.

The APD is on file in the Worland Field Office Branch of Minerals and Lands, and is considered an integral part of this EA by reference. The drilling plan, the operator's surface use plan, and the Plan of Development for the ROW are considered part of the Proposed Action. These documents include site-specific plans describing the proposed development (i.e., drilling plans with casing/cementing program; surface use plans with road and drill pad construction details; site-specific reclamation plans, etc.) Approval of all planned operations would be obtained in accordance with authority prescribed in Onshore Oil and Gas Order No. 1 (Approval of Operations on Onshore Federal and Indian Oil and Gas Leases).

The Proposed Action would consider the right-of-way application complete, and BLM would consider whether to approve the ROW as submitted with special terms and conditions consistent with 43 CFR 2805.12, as well as specific mitigation and monitoring measures for the proposed project area, which may be defined through the NEPA analysis.

The proposed location has been surveyed and staked by Fremont Engineering & Surveying. An onsite of the location was conducted on May 27, 2015 with the following people in attendance:

Darci Stafford, BLM	Dick Pate, Foreland Resources
Tim Stephens, BLM	Ben Garrison, Western Arch. Services
Connie Craft, BLM	Scott Harvey, S & B's
Leslie Coleman, BLM	Tom Fitzwater, Permittee
Derek Trauntvein, BLM	Jim Bob Byrd, Foreland Resources
Jared Dalebout, BLM	● Glen Luebking, Foreland Resources
Dora Ridenour, BLM	

2.2.1. Construction and Drilling

The following is a general discussion of proposed construction techniques to be used in the proposed action. Roads, power lines and flowlines constructed in association with this project

could require BLM right-of-way (ROW) authorizations and/or Sundry Notices and could include additional mitigation to minimize environmental impacts.

2.2.1.1. Access Road (Existing and New Construction)

To access the proposed well, begin at Thermopolis, Wyoming and proceed northwesterly on Wyoming State Highway 120 for 22 miles. Turn east on a paved road (Sand Draw Road) and continue for 3.2 miles to a fork in the road. Proceed north for 1.5 miles. Turn left on an existing 2-track after crossing Grass Creek and proceed 3.8 miles to the proposed location.

Total mileage for the primary route is approximately 27.3 from the starting points to the proposed well location. Existing roads would be maintained in as good or better conditions than at present.

Right-of-Way:

The proposed ROW access route length would be approximately 19,139.43' (3.62 miles), constructed to a 14-16' running surface with a 18' subgrade, and a width of 90', an envelope of 160' x 50' would be located between station 0+00 – 0+50, for 39.72 acres more or less, for right-of-way WYW-165340. In addition, a right-of-way for construction WYW-165340-01 would be approximately 19,139.43' in length, 10' width, and 2 envelopes of 50' x 10' and 100' x 5' for 4.42 acres more or less, which would result in 44.14 acres of disturbance. The actual disturbance from the road is expected to be less.

Construction standard for all new access roads:

Foreland is proposing to upgrade an existing two-track to an improved road. The total length of the road is 19,854'. The proposed construction would be designed for the anticipated levels of use of truck traffic which would be traveling the road, which includes both light and heavy duty trucks. The access road would be upgraded in two phases: Phase I – Exploration; and Phase II – Production. The two-phase approach is designed to minimize environmental impact and improve the success of reclamation should the well fail to produce. Phase I road improvements would be designed to allow for rig and truck access during construction and drilling. Initially, Foreland proposes to crown and ditch the road. During the exploration phase, installation of one 72"x60' culvert would be required. If the well is determined to be an economically viable well, the road would be fully upgraded to the design submitted with the APD.

The roads would be designed for vehicle travel up to 20 miles per hour, or 15 mph in some segments. The access road is designed to meet the standards of the anticipated traffic flow and all-weather requirements. The access road would not be constructed using frozen material or during periods when the soil material is saturated or when watershed damage is likely to occur.

The road would be crowned, ditched, and surfaced with gravel. Fifteen culverts, 2 low water crossings, and 1 cattleguard would be installed along the access road. Seventeen 100' x 17' pullouts would be constructed and confined within the 90 foot ROW, and would be located in safe and environmentally prudent areas. Access roads, surface disturbing activities and maintenance would conform to standards outlined in the BLM and Forest Service publication: *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, The Gold Book, Fourth Edition* (2007) and BLM Manual Section 9113.

Prior to road construction, the access road would be mowed of the vegetative cover and/or blading of the vegetation to the down-gradient side of the construction ROW (100'). Topsoil (3" deep)

would be stripped for the access road corridor. The topsoil would be cleared by fanning back during the construction and crowning of the road. Upon commencement of road construction, the topsoil would be replaced in the borrow ditches. Borrow ditches would be back-sloped to 3:1 gradient, and maximum grades would not exceed BLM standards.

Roads would be reclaimed back to the running surface. Topsoil would be reapplied along the borrow ditches to promote regrowth of vegetation. The reseeded of the borrow ditches would reduce the area utilized by this location. Foreland would reclaim as much surface disturbance from road construction as possible, not including the 14-16' running surface.

Runoff from disturbed construction areas would be minimized by implementation of appropriate Best Management Practices (BMPs). The BMPs may include but are not limited to road surface slope, drainage dips, straw wattles, etc. The BMPs would be repaired/replaced as needed and maintained in working condition for the life of the well.

The access road would be maintained in the same or better condition as existed prior to the commencement of operations. A regular maintenance program would include, but would not be limited to, graveling, blading, ditching, culvert installation, and surfacing. There would be no mud blading on the access road. Work would not occur when conditions are too muddy. No excess dirt would be placed in any existing drainage.

2.2.1.2. Well Pad Design and Construction

The proposed well pad would be approximately 300' x 350', but the disturbance area when adding in space to work, cuts/fills, and topsoil/spoils storage will be 420' x 462'. The well location would be cleared of vegetation and topsoil (up to six inches), which would be stockpiled for future use in reclamation.

All available topsoil would be stripped from all areas of construction including areas of cut, fill, soil storage, and access road. During construction of the road, topsoil would be windrowed to the edge of the disturbed area and redistributed evenly across the area prior to seeding. Soil materials and overburden would not be pushed over side-slopes or into drainage ditches. All soil material disturbed would be segregated to either the existing topsoil or spoil stockpiles to reduce the amount of disturbed area, as well as in an area where it can be retrieved.

Erosion would be monitored around the toe of the proposed stockpiles. Control steps would be implemented, if necessary, to prevent soil erosion. The pad would be leveled using standard cut-and-fill construction techniques. Construction would not commence during times when soils are saturated or when damage to adjacent water sheds could occur. Construction would not use frozen materials. Foreland would install a drainage ditch on the north end of the pad. An unlined flare pit would be constructed 150' from the drilling hole to vent any gas produced during the testing phase. Total disturbance for construction of the pad during drilling and completion is estimated to be 4.8 acres, which includes the disturbance for cuts and fills, storage piles, and working areas.

2.2.1.3. Drilling Operations and Well Completion

Drilling the well would utilize a drilling rig. Additional equipment, such as tanks, large machinery, trailers, etc., and material (pipes, liners, mud, etc.) needed for drilling operations would be trucked to the well site. It is estimated that total depth of the well would be reached

within approximately 30 days from the spud date, then 5 days of demobilization. An additional estimated 7 days is estimated for well completion operations, which includes staging and flowback of completion fluids.

Approximately 10,200 bbls of water would be required for drilling and completion operations. The water would be stored in steel tanks, located on the well pad. Upon assembly of the tanks, it would take a water truck with a capacity of 200 barrels per trip a total of 51 trips to fill the tanks.

A closed loop system would be used for the drilling of this well, no reserve pit would be required. Drill cuttings would be disposed of at a permitted landfill.

All produced fluids from drilling and completion would be flowed back to closed tanks, and trucked to and disposed of at a permitted facility.

Produced hydrocarbons would be put in test tanks on location during completion.

A blowout preventer would be used throughout the drilling operation.

Hydrogen Sulfide gas (H₂S) is not likely to be encountered during drilling; if H₂S is detected, the company will be required to shut down and implement their H₂S safety plan.

2.2.1.4. Location of Water Supply

Fresh water would be used for drilling operations. Water would be obtained from the municipal water supply for the city of Thermopolis, Wyoming. Water would be transported over existing roads via tank truck from the point of diversion to the proposed well location.

Waste Disposal Completion fluids would be flowed to tanks and would be hauled to an approved disposal facility. Produced fluid, including water, would be contained in test tanks during completion and testing, and disposed of at a WDEQ permitted facility. Produced oil would be sold.

Port-A-Potties would be installed at the location or along the access route during active construction and drilling. Garbage and other waste would be contained in a portable trash cage which would be totally enclosed with small mesh wire. Cage and contents would be transported to and trash dumped at a WDEQ approved sanitary landfill upon completion of operations.

2.2.1.5. Ancillary Facilities

No ancillary facilities are proposed at this time. In the event the well is successful, additional wells may be drilled from the same pad to reduce the amount of ground disturbance within the prospective area.

2.2.1.6. Production Operations

2.2.1.6.1. Well Production Facilities

If the well is produced, the traveled portion of production site would be surfaced with gravel upon completion of production facility installation and prior to production. Construction and maintenance would not be performed when the ground or topsoil is frozen or too wet to

adequately support construction equipment. If such equipment creates ruts in excess of four (4) inches deep, the soil would be deemed too wet.

Foreland would fence individual facilities to protect big game and livestock. All open vent exhaust stacks on any production equipment would be designed to prevent entry by birds and bats and would be equipped to discourage nesting or perching.

Facilities that are planned for the location include a heater treater, 3 storage tanks, pumping unit, and scrubber and flare stack.

Production equipment would be painted light reflective colors to limit evaporation and waste of liquid hydrocarbons. All above ground permanent structures would be painted to blend with the surrounding landscape. The color anticipated is Covert Green.

Production facilities would be clustered and placed away from cut/fill slopes to allow the maximum recontouring of cut/fill slopes. To reduce the view of production facilities from visibility corridors and private residences, facilities would not be placed in visually exposed locations (such as ridgelines and hilltops). The tallest structure would be no greater than 20' in height.

A dike would be constructed around the production facilities. The dike materials would be constructed of suitable materials and impermeable to the fluid contained. The dikes would have sufficient volume to contain a minimum of the total volume of the largest tank containing liquid hydrocarbons within the facility/battery and sufficient freeboard to contain precipitation, unless more stringent protective requirements are deemed necessary by the Authorized Officer.

2.2.1.6.2. Power Generation

Production equipment, including pumping units, would be powered by internal combustion engines or wellhead gas. If an alternative power source is identified, a Sundry Notice or ROW would be submitted at the appropriate time.

2.2.1.6.3. Flowlines

No flowlines are proposed. Oil would be trucked off location, and gas would be used for production activities.

2.2.1.6.4. Operations and Maintenance

2.2.1.6.4.1. Workforce and Traffic

The drilling and completion operation would require approximately ten to fifteen people at a time; including personnel for logging and cementing activities. The average daily traffic is anticipated to be between 7 -22 trucks per day, for a period of 23 days during drilling and staging; approximately 4 trucks per day are anticipated to visit the well site during completion operations, a period of 9 days. Subsequent to drilling and completion activity, this project would require the use of less vehicle traffic for day-to-day operations. Lighter traffic would include the use of field vehicles to visit the well daily. Heavy truck traffic would be associated with occasional work-over activities and hauling product from the location. If production is good, haul trucks may visit the location every 1 to 7 days.

2.2.2. Summary of Estimated Disturbances

Implementation of the proposed action would result in surface disturbance. The area of the well site is within the proposed catch lines, and includes the areas used for temporary storage of topsoil and waste material and construction equipment. The proposed action would include disturbances for the proposed access road and well pad on BLM surface lands.

Table 2.1 Estimated Surface Disturbance (Acres)

	Drilling Well Pad Disturbance	Access Roads Assuming 90' right-of-way width	Additional Road Construction Area (10')
On-lease	4.8	1.4	0.15
Off-lease		39.6	4.4
Total Disturbance			50.35

Table 2.2 Right-of Ways (New & Existing Disturbance)

ROW	Upgraded Access Road Off-lease	Construction Areas
Right-of-Way WYW-165340	19,139.43' x 90'; 1 envelope: 160' x 50';39.72 acres, more or less	
Right-of-Way WYW-165340-01		19,139.43' x 10'; 2 envelopes: 50' x 10'; 100' x 5' 4.42 acres, more or less
Total Acreage for Rights-of-Way		44.14

*New Surface Disturbance Included in Table 2.1

2.2.3. Interim Reclamation and Final Abandonment

2.2.3.1. Interim Reclamation

The well pad is anticipated to shrink to 1.35 acres after interim reclamation. Unused areas of the proposed well pad would be contoured with topsoil and seeded in accordance with the APD, within 6 months after drilling and completion operations have been concluded. The objective of interim reclamation would be to restore vegetative cover and a portion of the landform sufficient to maintain healthy, biologically active topsoil, control erosion, and minimize habitat, visual, and forage loss during the life of the well or facilities.

All available topsoil would be stripped from all areas of construction including areas of cut, fill, soil storage, and access road. During construction of the road, topsoil would be windrowed to the edge of the disturbed area and redistributed evenly across the area prior to seeding. Soil materials and overburden would not be pushed over side-slopes or into drainage ditches. All soil material disturbed would be segregated to either the existing topsoil or spoil stockpiles to reduce the amount of disturbed area, as well as in an area where it can be retrieved.

Interim reclamation would include disturbed areas that may be re-disturbed during operations and would be re-disturbed to drill additional wells or at final reclamation to achieve restoration of the original landform and a natural vegetative community.

Interim reclamation would consist of, but would not be limited to, pushing the fill material into cuts and up over the back slopes leaving no depressions that would trap water or form ponds. During interim reclamation, slopes would be reduced to a 3:1 ratio. All of the spoil pile would be used to re-contour the unused area of the pad to similar natural contours. All of the topsoil would be distributed evenly over the location.

The borrow ditches would be planted with the approved seed mix within the first growing season. Following interim reclamation, the cut and fill slopes would be planted with the approved seed mix within the first growing season.

The seeding rate for the proposed interim seed mixture is 8 lbs/acre of pure live seed (PLS). The proposed certified seed mixture for this location is:

2.0 lbs/acre PLS Bluebunch wheatgrass (*Pseudoroegneria spicata*)

2.0 lbs/acre PLS Indian rice grass (*Achnatherum hymenoides*)

2.0 lbs/acre PLS Needle and thread grass (*Hesperostipa comata*)

2.0 lbs/acre PLS Western wheatgrass (*Pascopyrum smithii*)

8.0 lbs/acre PLS- TOTAL

The area would be prepared for the seedbed by disking or ripping, following the natural contours. The entire area shall be uniformly covered with the depressions constructed perpendicular to the natural flow of water and/or prevailing wind. Seed would be drilled on contour at a depth no greater than 1/2 inch. In areas that cannot be drilled, broadcast seeding would be at double the seeding rate and harrowed or raked seed into the soil. Commercial seed would be either certified or registered seed. The seed mixture container would be tagged in accordance with state law(s) and available for inspection by the BLM Authorized Officer. Since seeds are of different sizes and require different planting depths, appropriate equipment would be used to ensure that the seed mixture is correctly and uniformly planted over the disturbed area. Seed would be broadcast or hydro seeded if drilling is not possible. When broadcasting the seed, the pounds per acre as listed in the APD would be doubled.

Seeding would be done in the fall from approximately September 15th until the ground is frozen or after the spring thaw until approximately May 15th to take advantage of the available ground moisture. Seeding would be repeated as necessary until a satisfactory stand is established.

Foreland would monitor and control invasive, noxious, and non-native species along rights-of-way for roads, well sites, or other applicable facilities. Canadian thistle, Bull thistle, hoary cress (whitetop), and puncture vine, have been identified as potentially being present in the project area, and would be treated if found. A Pesticide Use Proposal shall be submitted, and given approval, prior to the application of herbicides or other pesticides. A Weed Management Plan has been submitted to BLM for approval.

2.2.3.2. Final Abandonment

The long-term objective of final reclamation is to return the land to a condition approximating that which existed prior to disturbance. This includes restoration of the landform and natural vegetative community, hydrologic systems, visual resources, and wildlife habitats. To ensure that the long-term objective would be reached through human and natural processes, actions would be taken to ensure standards are met for site stability, visual quality, hydrological functioning, and vegetative productivity. At such time as the well is plugged and abandoned, the operator would submit a subsequent report of abandonment. Reclamation of the well site would consist of re-contouring the well site, access road, and other disturbed areas to approximately the original contour that existed before construction, final grading and replacement of topsoil. Final reclamation would include disturbed areas where the original landform and a natural vegetative community have been restored. Cut and fill slopes would be reshaped to no steeper than a 4:1 slope. Access roads would have their crowns and ditches removed. The entire surface of the well site, access road and other disturbed areas would be ripped and cross ripped to reduce compaction prior to topsoil placement. All of the topsoil would be re-spread on the disturbed area, including during interim reclamation, so that no topsoil remains in the stockpile, and would be seeded with the following seed mix:

2.0 lbs/acre PLS Bluebunch wheatgrass (*Pseudoroegneria spicata*)

2.0 lbs/acre PLS Indian rice grass (*Achnatherum hymenoides*)

2.0 lbs/acre PLS Needle and thread grass (*Hesperostipa comata*)

2.0 lbs/acre PLS Western wheatgrass (*Pascopyrum smithii*)

1.0 lbs/acre PLS..... Wyoming big sagebrush (*Artemisia tridentata wyomingensis*)

0.5 lbs/acre PLS..... Scarlet globemallow (*Sphaeralcea coccinea*)

0.5 lbs/acre PLS..... American vetch (*Vicia Americana*)

10.0 lbs/acre PLS- TOTAL

If necessary to ensure timely revegetation, the pad would be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species become firmly established, whichever comes later. Fencing would meet standards found in the Gold Book, 4th Edition, or would be fenced with operational electric fencing.

Weed control would be performed during final reclamation. Stabilization would be performed with the appropriate BMP as conditions dictate. BMPs may include any of the following straw mulch, existing vegetation, surface roughening, straw waddles, straw bales, silt fence, redistribution of wood debris, and barricading.

2.3. Alternatives Considered but not Analyzed in Detail:

The surface location of the proposed action could be situated at different locations within the lease. Different surface locations may result in a deviation of effects from the proposed alternative, and may result in a net positive or net negative change in potential effects.

The well location was moved and re-staked 111' to the northwest of the originally staked location, in order to avoid cutting into a hillside. However, the well site will still be large cuts on the pad.

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Chapter 3. AFFECTED ENVIRONMENT and *ENVIRONMENTAL EFFECTS*

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This chapter characterizes the resources and uses that have the potential to be affected by the proposed action, followed by a comparative analysis of the direct, indirect and cumulative impacts of the alternatives. **Direct** effects are caused by the action and occur at the same time and place. **Indirect** effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. **Cumulative** impacts result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions.

3.1. Introduction

3.1.1. General Setting and Geographic Scope of the project area

The project is located 21 miles northwest of the town of Thermopolis, Wyoming. The soils in the area of the proposed well are mapped as loamy. Sagebrush shrublands dominate the vegetation type, and topography ranges from rolling hills to rock outcrops. Primary uses in the project area include primarily grazing and hunting, with some oil and gas development to the southeast. One (1) plugged and abandoned well, and 1 agricultural water well occur within 1 mile of the proposed NCRU 14-29 well.

3.1.2. Resources Not Analyzed

Resources and features not present or not affected by the proposed action or alternatives, and not discussed in this EA, include: Environmental Justice, Prime or Unique Farmlands, Flood Plains, Native American Religious Concerns, paleontological resources, riparian areas, Class I visual management areas, Class I Airsheds, Wild and Scenic Rivers, Wetlands, Threatened and Endangered and BLM Special Status plants, Livestock Grazing, Geology and Mineral Resources, Solid and Hazardous Wastes, Public Health and Safety, Fuels, and Forests.

3.2. Resources Carried Forward for Analysis

3.2.1. Cultural Resources, Traditional Cultural Properties, Native American Religious Concerns

Issue(s) Identified

How would the proposed surface disturbance affect cultural resources eligible or unevaluated for the National Register of Historic Places (NRHP)?

Affected Environment

The area of potential effect (APE) is defined by the Wyoming State Protocol Agreement between the BLM and the SHPO (State Protocol) as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties (cultural resources eligible or unevaluated for the National Register of Historic Places), if any such properties exist. The area of potential effect is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

The APE was defined for the current undertaking to include the proposed surface disturbance (direct), approximately 50 acres, and the viewshed from the proposed well pad and access

road (indirect). A class III cultural resources inventory was completed for the direct APE which includes the proposed well pad and access road (BLM cultural project #010-2015-069). Approximately 129.99 acres were inventoried to determine effects to historic properties within the APE. Twelve sites, two multi-component and ten prehistoric, and 7 isolated resources, were identified in the APE. Two historic properties were identified within the indirect APE. The APE includes two prehistoric sites eligible for the NRHP under criterion D; all other cultural resources are not eligible. No historic properties were identified in the direct APE.

Direct and Indirect Effects

No Action

Under the No Action Alternative, the development of the proposed action would not occur. No resulting effects on cultural resources would be expected to occur beyond the current situation.

Proposed Action

Impacts occur to historic properties when a proposed project would directly or indirectly alter any of the qualities of that property that qualify it for inclusion in the NRHP. Potential impacts from the proposed action include: physical destruction of or damage to all or part of a property (direct impact) or introduction of visual or atmospheric elements that diminish the integrity of a property's significant features (indirect impact).

No historic properties were identified within the project's direct APE. Surface disturbance resulting from the proposed action, approximately 50 acres, would have no effect on known historic properties. Inclusion of the standard cultural stipulation in the Proposed Action mitigates any potential effects to unknown cultural resources discovered by surface disturbing activities.

Two historic properties, both eligible under criteria D where setting is not an important aspect of integrity, were identified within the project's indirect APE. Although not anticipated, the proximity of the property to the proposed surface disturbance increases the possibility of inadvertent impacts to the property. Assuming the mitigation measures below are followed, as with the No Action alternative, the Proposed Action will have no adverse effect on known historic properties. Consultation occurred with the State Historic Preservation Office (SHPO) under the State Protocol.

Mitigation

As described in the Proposed Action, the proximity of the historic property to the proposed surface disturbance increases the possibility of inadvertent impact to the property. As mitigation, a temporary barrier fence would be installed between the proposed surface disturbance and the historic properties during construction of the well pad and access road. The Operator would provide a Cultural Resource Use Permittee (CRUP) to monitor the installation and removal of the temporary barrier fence and during all surface disturbances by construction activities associated with this project within T45N, R96W, section 5, and T46N, R96W, section 32.

Also, due to the soil conditions, unknown cultural resources may be affected by surface disturbing activities. As mitigation, the Operator would provide a CRUP to monitor all surfaces disturbed by construction activities associated with this project within T46N, R96W, section 32. In the event cultural materials are discovered during surface disturbance, the procedures found within the State Protocol Appendix K would be followed. For the protection of unknown cultural resources,

the standard cultural stipulations apply to all aspects of the Proposed Action and are included in the conditions of approval.

Cumulative Effects

Construction and development of oil and gas resources impact cultural resources through ground disturbance, unauthorized collection, and visual intrusion of the setting of historic properties. Potential impacts to historic properties are mitigated under the proposed action. Since there would be no direct or indirect effects on contributing segments of known historic properties, there can be no cumulative effects.

3.2.2. Native Vegetation

Issue(s) Identified

How would the proposed APD and ROW affect upland vegetation meeting or not-meeting Rangeland Health Standard 3: Upland vegetation on ecological site consists of plant communities appropriate to the site which are resilient, diverse, and able to recover from natural and human disturbance?

Affected Environment

The project area is in the Grass Creek (#00522) grazing allotment. The Grass Creek allotment is comprised of 8,994 acres of BLM managed public land, 849 acres of State of Wyoming land, and 1,094 acres of private land. Upland vegetation in the Grass Creek allotment is managed through one grazing permit for cattle use. Grazing use occurs in the late spring/early summer months and then again in the winter months in a rotational pattern with a neighboring allotment, Lower Cottonwood (#00521). A rangeland health assessment with accompanying determination of Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the State of Wyoming (1997) has not been performed in the allotment.

The project area consists of several ecological sites, with the Loamy 10-14" (R032XY322WY) being the most prominent. The Loamy 10-14" ecological site climax plant community should be dominated by Bluebunch Wheatgrass, Rhizomatous Wheatgrass, with a component of Big Sagebrush, forbs, and other desirable cool season grasses (NRCS 2008). Current monitoring data has not been collected in the allotment on the loamy sites, but field observations and existing monitoring data show that a majority of the vegetation in the project area in the lower elevations near Grass Creek are in the Blue Grama Sod state while the upper elevation areas near the proposed well are in the Perennial Grass/Big Sagebrush state. A mixture of the two states is also seen in areas along the proposed ROW indicating transition between the Blue Grama Sod and the Perennial Grass/Big Sagebrush states in the project area.

Direct and Indirect Effects

No Action

Under the No Action alternative, the proposed project would not be implemented. The well would not be drilled and the two-track road used to access the site would not be upgraded. No disturbance outside the permitted grazing use would occur to upland vegetation. Conditions as

they are now would continue to persist into the future which would not change, positively or negatively, the upland vegetation's ability to meet Rangeland Health Standard 3.

Proposed Action

Under the Proposed Action, approximately 50 acres of upland vegetation would be disturbed in the Grass Creek allotment compared to the No Action alternative. The disturbance, by implementing the Proposed Action, would require that part of these acres, such as the well pad and the crowned portion of the access road, have all the vegetation removed. Disturbing and removing the vegetation would mean that these acres would fail to meet Rangeland Health Standard 3. This means that 0.5% of the public land acres in the allotment would not meet Standard 3 due to this project. Implementing this project would not affect the overall vegetative conditions within the allotment because it is only 0.5% of the public land acres in the allotment. Because no rangeland health assessment has been performed there can be no comparison made to the effect the proposal would have on acres currently meeting Standard 3.

Mitigation

No mitigation is proposed.

Cumulative Effects

No ongoing or future foreseeable actions were identified in or near the project area; therefore, no cumulative effects to upland vegetation resources were identified.

3.2.3. Invasive, Non Native Species Noxious Weeds

Issue(s) Identified

How would the proposed project affect the introduction and spread of noxious weeds?

Affected Environment

The proposed project falls within the Grass Creek Weed Management Area. A recent survey of the area shows no noxious weeds present at the well site or along the site access road.

Direct and Indirect Effects

No Action

If the No Action alternative is selected, there would be no change in the current plant populations.

Proposed Action

The Proposed Action would increase the use of vehicles in the Grass Creek allotment. This increase could result in the spread of noxious weeds into areas where there currently are no known infestations of noxious weeds and few invasives. Noxious and invasive species have the tendency to displace desirable native vegetation which would lead to more acres not meeting Rangeland Health Standard 3. The applicant has a weed management plan in place that would decrease the probability of noxious weeds displacing desirable upland vegetation.

Cumulative Effects

Cumulative Impact Assessment Area

The CIAA for invasive species is the Grass Creek Weed Management Area within the Cottonwood Creek- Spring Gulch sub-watershed.

Timeframe of the Cumulative Effects Analysis

The time frame for the cumulative effects is post 1910 when grazing and oil and gas development occurred in the CIAA. Existing activities in this area include historical and ongoing oil and gas development and grazing. These activities have contributed to the removal of native vegetation and the introduction of invasive plant species.

Past, Present , Ongoing, and Foreseeable Future Actions

The past grazing and oil development activities have already led to the invasion and establishment of invasive weed species in the CIAA. Invasive species have caused a decrease in habitat quality for wildlife and a loss of desirable forage for livestock. Additional disturbance in the CIAA would contribute cumulatively to the local and regional invasive weed populations by increasing the vulnerability of soils to invasion and increasing the vectors (i.e. vehicles, heavy equipment, and transported topsoil) for the introduction of invasive species.

If the exploratory well is successful, the watershed will be subject to future drilling activity. This activity will increase disturbance and contribute to the likelihood of invasive plant populations and an increased need for weed management.

3.2.4. Recreation and Visual Resource Management; Special Designations (Including ACECs, Wild and Scenic Rivers, Lands with Wilderness Characteristics)

Issue(s) Identified

How will the proposed action impact visual resources in Class III and IV VRM landscapes?

How will the proposed action impact the character of lands with wilderness characteristics unit 622 AK and the dispersed recreational opportunities of the area including hunting?

Affected Environment

The project area is located 21 miles northwest of Thermopolis, Wyoming, on BLM-administered public lands that are not managed under either special or extensive recreation management areas (SRMA/ERMA). Public lands that are not designated as SRMA's/ERMA's are managed to meet basic recreation and visitor services and resource stewardship needs. Recreation is not emphasized within this area, but it is recognized that recreational activities occur, such as hunting, motorized touring, and other dispersed recreational activities.

The project area falls completely within lands with wilderness characteristics unit 622 AK (29,690 ac), which encompasses much of the western portion of Blue Mesa and portions of Rankin Basin. The topography of the nearly 30,000-acre unit is characterized by rolling hills and flats mixed with angular, breaks-type ridges and coulees. The vegetation type is sagebrush – steppe. The naturalness of lands with wilderness characteristics unit 622 AK is compromised by a gas pipeline, two crude oil pipelines, a water pipeline, a transmission line, and many two-track

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routes, reservoirs, and stock tanks. Proposed in 2009, the WFO ID Team decided in November 2011, not to manage this unit for wilderness character due to the presence of other resources and existing impacts. lands with wilderness characteristics unit 622 AK remains in the WFO lands with wilderness characteristics inventory.

The open character of the sagebrush steppe project area makes it vulnerable to visual resource impacts. The proposed action is located on BLM administered public lands managed under VRM Class III and IV objectives. Class IV management objectives are the least restrictive of the VRM classifications. The more restrictive Class III objective states: “The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate... Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.” (Visual Resource Inventory Manual H-8410, p.8-28).

The visual impacts of the proposed action (described in this section and in the design features of the proposal) fall within the parameters of VRM Class III management objectives.

Direct and Indirect Effects

No Action

Under the No Action alternative, the proposed project would not be implemented, the well pad would not be constructed, the two-track road used to access the site would not be upgraded, and drilling operations would not be implemented. No disturbance to the existing form, line, color, or texture of the visual landscape would occur. No increase in traffic or human activity from drilling operations would occur. Conditions as they are now would persist, which would not change the visual or recreational character of the area.

Proposed Action

The Proposed Action will mechanically disturb the soils and vegetation over approximately 50 acres of terrain – 45 acres attributed to the ROW, and 5 acres attributed to the well pad. These mechanical disturbances will impact the visual resources of the area by changing the form, line, color, and texture of the surrounding viewshed. These impacts are within the scope of VRM Class III and IV management objectives where “the level of change to the characteristic landscape should be moderate” and “the level of change to the characteristic landscape can be high” respectively (Visual Resource Inventory Manual H-8410, p.8-28).

The anticipated truck traffic, described in Chapter 2 under Workforce and Traffic, during the specified 23-day drilling and staging period, and the 9-day completion period, represents an increase in traffic from normal recreational use of this area. This increase in traffic could impact the recreation resources of the area, particularly opportunities for hunting and solitude (whether associated with the lands with wilderness characteristics or not).

lands with wilderness characteristics unit 622 AK is 29,690 acres in total area. The Proposed Action would disturb 50 acres within that 29,690 acre region. Most of the disturbance (45 ac) would be associated with ROW improvements, and about 5 acres of disturbance would be attributed to construction of the well pad. In total, about 0.17% of the area of lands with wilderness characteristics unit 622 AK would be disturbed. ROW improvements account for 0.15% of that disturbance, and the remaining .02% (approximate) would be associated with well pad construction.

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As per the 2015 WFO RMP, record # 6197, the WFO does not manage for wilderness characteristics in lands with wilderness characteristics's. Rather lands with wilderness characteristics's are to be managed consistently with other resource objectives. The proposed action represents a competing resource demand that takes precedence over wilderness characteristics. Therefore, the impacts to lands with wilderness characteristics unit 622 AK are tolerable under current management decisions.

According to the wildlife section later in this document, human presence typically increases as vehicle traffic increases, and both vehicle noise and human presence are disruptions that can result in wildlife displacement. The Proposed Action's disturbance and increased human presence could cause some wildlife species like mule deer to displace away from these activities to more secure and disturbance free habitats.

It is reasonable to anticipate a similar displacement of human hunting activity to mirror that of the mule deer and other game species affected by the Proposed Action.

Mitigation

The mitigation for the impacts to the visual resources of the area have already been addressed in the project proposal. Specifically, a revegetation plan is included, and the well location was moved and re-staked 111' to the northwest of the originally staked location, in order to avoid cutting into a hillside. The proposal also states that "Reclamation...would consist of re-contouring the well site, access road, and other disturbed areas to approximate the original contour that existed before construction...The long-term objective of final reclamation is to return the land to a condition approximating that which existed prior to disturbance."

No mitigations are necessary regarding lands with wilderness characteristics unit 622 AK or the dispersed recreation opportunities for this area. The timing stipulations from the wildlife section of this document effectively mitigate conflicts between proposed operations and recreational hunters. Other dispersed recreational use in this area is sporadic and mitigations would be impractical.

Residual Effects

No residual effects are anticipated.

Cumulative Effects

Cumulative Impact Assessment Area

For the purposes of this section, the Cumulative Impact Assessment Area will be described by the boundaries of lands with wilderness characteristics unit 622 AK, an area of 29,390 acres. This area includes much of the western portion of Blue Mesa and portions of Rankin Basin between Gooseberry Highway (WY 431) to the north, Cottonwood Creek Road (Cty Rd 13/16) to the south, and the Meeteetsee Highway (WY 120) to the west.

Timeframe of the Cumulative Effects Analysis

The Cumulative Effects Analysis timeframe regarding effects on recreation and visual resources extends back in time to when the various two-track routes were formed and other developments such as transmission line and pipelines were constructed, probably in the 1950s and 1960s. The Cumulative Effects Analysis timeframe will extend into the future for the life of the producing well, approximately 20-30 years.

Past, Present , Ongoing, and Foreseeable Future Actions

Existing impacts within the lands with wilderness characteristics unit 622 AK geographic area include a gas pipeline, two crude oil pipelines, a water line, a transmission line, and many two-track routes, reservoirs (about 24), and stock tanks (at least 11). The proposed action will improve an existing road and construct a new well pad within the geographic area of lands with wilderness characteristics unit 622 AK. The impacts of the proposed action will add to the impacts of the other developments mentioned above. If the well proves as a producer, it is reasonable to expect requests for other exploratory wells and perhaps additional ROW's and well pads within the 20-30 year future timeframe.

3.2.5. Soils

Issue(s) Identified

How would the proposed project affect runoff and erosion?

Affected Environment

The proposed disturbance falls primarily within the Loamy 10-14" (R032XY322WY) ecological site. Soils within this site are very deep to moderately deep, moderately well to well-drained, and moderately slow to moderately permeable. The soil characteristic having the most influence on plant community is the available moisture and the potential to develop salts near the surface. Surface textures include loam, fine sandy loam, and sandy loam. Subsurface textures include loam, sandy clay loam, clay loam, silty loam, and sandy loam.

According to web soil survey, approximately 2.2 acres of the proposed disturbance along the access road falls within the severe rating for road/trail soil erosion hazard. The remainder of the project area falls within the moderate erosion hazard rating. Most of the project area is moderately susceptible to site degradation due to wind erosion. All of the project area has a severe rutting hazard rating due to low soil strength. However, all but 2.2 acres of the project area has a high restoration potential attributed to soil resilience factors such as adequate stores of organic matter, good soil structure, low salt and sodium levels, and other soil properties. The remaining 2.2 acres has a moderate potential for restoration which can be attributed to soil depth and sodium content. The entire project area is rated as moderate for construction limitations for haul roads and log landings. This rating is based on low soil strength and dusting potential.

Direct and Indirect Effects

No Action

If the No Action alternative is selected, the soils would not be impacted negatively or positively.

Proposed Action

According to web soil survey, approximately 2.2 acres of the proposed disturbance along the access road falls within the severe rating for road/trail soil erosion hazard. The remainder of the project area falls within the moderate erosion hazard rating. Most of the project area is moderately susceptible to site degradation due to wind erosion. All of the project area has a severe rutting hazard rating due to low soil strength. However, all but 2.2 acres of the project area has a high restoration potential attributed to soil resilience factors such as adequate stores of organic matter,

good soil structure, low salt and sodium levels, and other soil properties. The remaining 2.2 acres has a moderate potential for restoration which can be attributed to soil depth and sodium content. The entire project area is rated as moderate for construction limitations for haul roads and log landings. This rating is based on low soil strength and dusting potential. The Proposed Action would temporarily increase the amount of runoff and erosion along the access road and around the well pad. Increased traffic would increase the risk of rutting due to low soil strength.

Mitigation

Foreland plans to strip topsoil from all areas of construction and later redistribute evenly across the area prior to seeding. Soil material disturbed would be segregated to either the existing topsoil or spoil stockpiles to reduce the amount of disturbed area. Given the high potential for restoration of soil resources, impacts can be appropriately mitigated using the proposed mitigation measures.

Residual Impacts

No residual impacts are anticipated.

Cumulative Effects

Cumulative effects for soil resources in the Cumulative Impact Assessment Area (CIAA) are analyzed in the Water Resources Cumulative Effects section.

3.2.6. Water Resources (Water Quality and Ground Water,)

Issue(s) Identified

How would the installation of 15 culverts and two low water crossings impact surface water runoff in adjacent tributaries of Cottonwood Creek?

Affected Environment

The proposed access route and well pad is located within the Cottonwood Creek- Spring Gulch level 6 sub-watershed HUC # 100800070609 as defined by the USGS (United States Geological Survey). The existing two track route crosses several small intermittent drainages in the watershed that flow primarily during snow melt and runoff events in a southeastern direction to the confluence with Cottonwood Creek.

The nearest drainage from the proposed well pad is an intermittent drainage to Cottonwood Creek that is located approximately 425 feet to the west of the well pad.

The topography of the area consists of ephemeral/intermittent drainages that are dissected by outcrops of mudstone, sandstone, shale and various alluvial deposits. The flow regime of the drainages of the watershed in the proposed project area is generally ephemeral which is defined as having flow within these channels primarily following storm events that are capable of producing runoff during the summer and fall months. There is also a snow melt period in the central region of the Bighorn Basin that typically occurs in the months of March and April from watershed elevations such as this watershed located below 6000 feet. The road density is light in the area, and other watershed disturbances that have occurred are associated with ranching operations and recreational use. There is no actual recorded water quality data for these drainages; however, local recent watershed studies suggest that water quality from these lower watersheds in Cottonwood Creek have a flashy flow regime with high sediment loads and short flow durations (SEH, 2007).

The current disturbances that affect the hydrology of this sub-watershed on public land consist of two track roads and grazing that occurs within these sub-watersheds. These sub-watersheds in the area are low lying, semi-arid watersheds, where evaporation and transpiration rates greatly exceed received precipitation throughout the year.

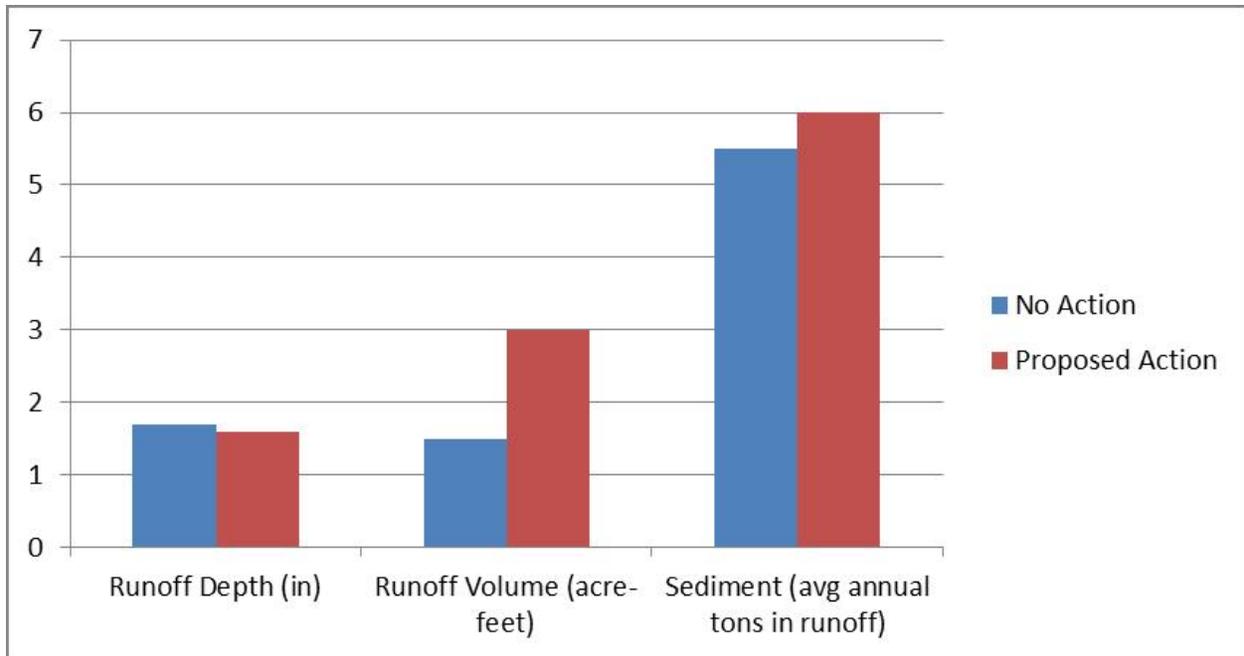
Direct and Indirect Effects

No Action

Under the No Action alternative, the development of the Proposed Action would not occur. The access road and the exploratory well and well pad would not be constructed. The current infiltration rates and runoff conditions in the proposed disturbance area of the Cottonwood Creek-Spring Gulch sub-watershed would remain unchanged. The native channel conditions would remain unchanged. There would be no installation of fifteen culverts or two low water crossings along the proposed route. There would be no change to water quality or runoff conditions in the area from this alternative.

Proposed Action

The Proposed Action would disturb approximately 50 acres. Impacts from the Proposed Action to surface water would be from increased amounts of storm water runoff from the road and well pad. The upgrade of the existing two track road and well pad will reduce the natural infiltration rates and runoff patterns surrounding the site. The Proposed Action will cause a localized loss of natural vegetation and creation of semi-impervious cover from the pad and access route. The amount of additional sediment generated, as discussed in the soils section, would be transported down the drainage following storm events, via ephemeral channels to Cottonwood Creek. The proposed plan would also authorize placement of 15 culverts and two low-water crossings per Exhibit III of the submitted surface use plan. These are culverts of 18, 24, and one 72 inch diameter that will be placed along road crossings. There will be localized disturbance following the installation of the culverts and upgrade of the road to the drainages at all of these locations. The culverts will capture runoff and concentrate flow in the channel at these areas and transmit storm water runoff from the road surface. The culverts were sized and designed to allow for safe passage of water following a typical 10 year 2 hour storm event per BLM 9113 road construction standards without significant erosion in the channel. Additional surface disturbances from roads and other development in a watershed cause minor increases as estimated to be 0.5 annual tons of sediment leaving buffer, increase of 1.5 acre feet in runoff, and decrease of 0.1 inches in runoff depth (Elliot et al WEPP, 2010 using localized data) in peak runoff volume and velocity due to decreased infiltration rates from developed areas.



Mitigation

No mitigation is proposed.

Cumulative Effects

Cumulative Impact Assessment Area

The Cumulative Impact Assessment Area (CIAA) for this action is the hydrologically connected areas in the Cottonwood Creek- Spring Gulch sub-watershed that are mentioned in the affected environment section.

Timeframe of the Cumulative Effects Analysis

The time frames for the cumulative effects that have occurred are post 1910 when grazing and subsequent oil field development occurred in the CIAA. There has been permitted grazing, which is the dominant land use in the area, in correlation with natural climatic and geologic conditions that contributed to the current watershed runoff conditions.

Past, Present and Future Actions

The previously permitted activities of oil field development from other wells in the sub-watershed have slightly increased the percentage of impervious surface cover in the sub-watersheds. The historic alterations to the sub-watersheds were the creation of roads and well pads associated with energy development. This is an exploratory well and beyond the outer localized disturbed areas. The alteration of the native surface has had an indirect effect on runoff volume and water quality of the runoff following storm events. The creation of an additional road, and installation of 15 culverts, will be added to other watershed past disturbance.

Although statistically insignificant compared to the total sub-watershed sizes, the current action would increase the percentage of impervious cover in the sub-watershed and in particular within the hydrologically connected hydrologic response unit downstream of the Proposed Action. The

amount of land use change from native conditions in the sub-watershed and the downstream hydrologic response unit of Cottonwood Creek-Spring Gulch watershed would be subject to possible future drilling activity in the area if the well were successful. The HRU could have increased anthropogenic pressure from potential development in the area.

Cumulative Effects Table					
Alternative	Cumulative Impact Assessment Area (CIAA)/Geographic Scope	CIAA/Temporal Scope	Past-Present Actions	Future Actions	Direct-Indirect Effects
Action	FR NRCU 14-29A Area of Cottonwood Creek Spring Gulch Sub-Watershed	30- 100 years (or length of the well life)	Approval of Application of Permit to Drill and other Oil and Gas Related Actions and Activity	Continued oil and gas development and associated facilities	The direct effects are the surface disturbing activities of the well pad, access road, and installation of 15 culverts . The indirect effects are the increased runoff volumes and sediment generated from disturbing activities. Increase in 1.5 acre feet of runoff and 0.5 tons erosion from the site. Decrease in runoff depth of 0.1 inches annually. Cumulative increase of 46 disturbed acres within the 40,000 acre sub-watershed area.
No Action	FR NRCU 14-29A Area of Cottonwood Creek Spring Gulch Sub-Watershed	30- 100 years (or length of well life)	No approval of Application of Permit to Drill and other Oil and Gas Related Actions	Continued oil and gas development and associated facilities	There would be no surface disturbing activity associated with the pipeline facility. The naturally occurring runoff and erosion rates would remain unchanged.

3.2.7. Fish/Wildlife (Including Threatened, Endangered, Candidate and BLM Sensitive Species)

Issue(s) Identified

What impact will the proposed access route and well pad surface disturbance, and vehicle traffic and drilling disruption, have on wintering mule deer and sage-grouse, as well as avian sagebrush obligate nesting?

Affected Environment

The wildlife habitat within the proposed project area consists of rolling upland benches bounded by incised drainages, with the dominant vegetation being Wyoming sagebrush/perennial bunchgrass and forb community. The area does provide habitat for numerous wildlife species, some seasonally and some yearlong. The southern portions of the access road are mapped as mule deer big game winter range, and both mule deer and antelope could be expected yearlong throughout the entire project area. All of the proposed access road, ROW, and well pad are within the Oregon Basin core sage-grouse habitat polygon (priority habitat), which includes a winter concentration area on the northern portion of the access road and well pad. The closest occupied lek is approximately 1.2 miles north of the proposed well pad, and this lek is one of seven occupied leks, all north and east of the proposed project, that comprise a complex of leks, nesting, and winter concentration areas called the Blue Mesa Complex . Sagebrush habitats in the vicinity of the access road and well pad appear to be suitable for sage-grouse nesting and/or early brood rearing; a nest was located within the proposed well pad boundaries during

the onsite. Habitats become patchy and dryer as you move south towards Cottonwood Creek. These same sagebrush habitats are also likely providing some nesting and foraging habitat for sagebrush obligate passerines like the sage thrasher, sage and Brewer's sparrows. There are also several other small mammals, predators, passerines, and raptors that use this area, some yearlong. No known threatened or endangered animal species are known to inhabit this area, but the sage-grouse, sage thrasher, sage and Brewer's sparrow are all Wyoming BLM Sensitive Species.

Direct and Indirect Effects

No Action

Under the No Action alternative, the surface disturbing and disruptive activities from the proposed road improvements, well drilling activities, and vehicle traffic volume would not occur, and displacement of wildlife and habitat removal and fragmentation would not be anticipated. No resulting effects on wildlife resources would be expected to occur beyond the normal pre-existing traffic volume.

Proposed Action

The potential 50 acres of surface disturbance or sagebrush habitat removal from the access road improvements and well pad construction will result in long term direct impacts in the form of habitat loss and fragmentation, until reclamation and sagebrush re-establishment are providing habitat again, which will likely be 20 to 30 years post reclamation. Because this proposed disturbance is within priority habitat, the proposed 50 acres of habitat removal requires a DDCT (density disturbance calculation tool) to make sure the addition of the proposed disturbance along with existing disturbances does not exceed the 5% disturbance cap. The DDCT process was conducted per Worland Field Office ARMP- Appendix D guidelines using the DDCT web application and reviewed by the WGFD; the project was found to be compliant with SGEO-2015-4. DDCT results for the project are as follows: Project Disturbance = 0.07%, Density = 0.03/640 acres. This would increase habitat loss by 0.07% more than the No Action Alternative. Until reclamation is successful, habitat will be removed from the project area.

The disruption caused by increased vehicle traffic and human presence, from both the road improvement and well drilling phase, will also result in short term direct impacts in the form of temporary disruption and potential displacement out of the proposed project area, particularly during critical wintering and nesting periods for big game and sagebrush obligates mentioned above. On page 169 of the 2015 Worland Field Office RMP, disruptive activity is defined as "those activities that disrupt or alter wildlife actions at key times, during important activities, or in important areas (feeding, breeding, nesting, herd movement, winter habitat)". This disruption has the potential to render these surrounding sagebrush habitats undesirable and most likely unsuitable for the sagebrush obligate nesting and foraging. The proposed disturbance and human presence could also cause some wildlife species, like the mule deer, to displace away from these activities to more secure and disturbance free habitats, and potentially less desirable habitats. Typically human presence increases as vehicle traffic increases, and both vehicle noise and human presence are the disruption that can result in wildlife displacement.

From access road and well pad construction, through the drilling and completion phase, there will be varying levels and types of vehicle traffic disturbance or disruption. The drilling and completion operation would require approximately ten to fifteen people at a time, including personnel for logging and cementing activities. Average daily traffic is anticipated to be between 7 -22 trucks per day, for a period of 23 days during drilling and staging; approximately 4 trucks

per day are anticipated to visit the well site during completion operations, a period of 9 days. Subsequent to drilling and completion activity, this project would require the use of less vehicle traffic for day-to-day operations. Lighter traffic would include the use of field vehicles to visit the well daily. Heavy truck traffic would be associated with occasional work-over activities and hauling product from the location. If production is good, haul trucks may visit the location every 1 to 7 days. However, maintenance and production activities like well plugging or work over operations that last 24 to 48 hours or longer are considered disruptive activities (p 169, Worland Field Office RMP 2015).

Research conducted in 1999 and 2000 in western Wyoming, looking at sagebrush obligate passerine response to natural gas roads, found that the density of sagebrush obligates particularly Brewer's and sage sparrow, was reduced by 40-50% within a 100-m buffer around dirt roads with low traffic volumes averaging 9 to 12 vehicles per day (Ingelfinger and Anderson 2004). In comparing the findings of 13 separate studies that reported quantitative data on sage-grouse responses to energy development, Hagen (2010) found that anthropogenic features had a negative effect on displacement in all biological seasons for which effect size could be estimated with the largest effect on nesting season. The presence of power lines had the largest measurable effect on displacement, followed by roads. For example, avoidance for greater sage-grouse can occur out to approximately 3.1 miles (5 km) for nesting and leking (Holloran 2005, Johnson et al. in press). Disturbances from vehicle traffic, noise, and human activities often displace mule deer to areas farther away from well pads (Sawyer et al. 2006). This displacement could be to areas of less suitable habitat. This disturbance and displacement diverts time and energy away from foraging, resting, and other activities that improve physiological condition (Gill et al. 1996, Frid and Dill 2002). Sawyer et al. (2006, 2009a, 2009b) showed that high-use deer areas on winter range consistently occurred 1.2 to 1.8 miles away from well pads. Additionally, Sawyer et al. (2009a) found mule deer avoided all types of well pads, but selected areas farther from well pads with greater levels of human disturbance (i.e., traffic). With the traffic volume anticipated with these proposed activities mentioned above, we would expect similar or greater reductions in sagebrush obligate densities, at least within 100 m of the access road and well pad. We would also expect displacement of wintering and nesting sage-grouse, as well as wintering mule deer, associated with this increased traffic volume and human presence.

Mitigation

For the southern portion of the proposed access road within crucial mule deer winter range, no surface use is allowed from 11/15 to 4/30 and a timing limitation would be applied for this time period, protecting wintering mule deer. For the northern portion of the access road and the well pad within a sage-grouse winter concentration area, there is a prohibition on surface-disturbing and/or disruptive activities from 12/1 to 3/15 and a timing limitation would be applied for this time period protecting wintering sage-grouse concentrations. For both the entire access road and well pad, all within the priority habitat, there is a prohibition on surface-disturbing and/or disruptive activities from 3/15 to 6/30 and a timing limitation would be applied for this time period protecting breeding, nesting and early brood rearing sage-grouse (see Appendix 1 - Wildlife Resources Map). Also, the above protections for sage-grouse breeding, nesting, and early brood rearing would serve to protect other avian nesting sagebrush obligate species mentioned above, during their 4/10 to 6/15 nesting period, from any surface disturbing or disruptive activities.

After the road improvements, drilling, and completion phases are completed, normal well maintenance and emergency work to prevent or control a threat to either human health/safety or the environment would not be considered a disruptive behavior. However maintenance and

production activities like well plugging or work over operations that last 24 to 48 hours or longer scheduled during the timing limitation period are considered disruptive activities, (Worland Field Office RMP 2015, p 169). Such work during the timing limitation period would require a Sundry Notice for approval. After the well is completed, only activities involving additional surface disturbance, such as flowlines or power lines, would be subject to seasonal stipulations.

The implementation of the above mitigation measures would mitigate impacts to displaced wildlife, including avian sagebrush obligates and wintering big game identified in the proposed action.

Cumulative Effects

The Cumulative Impact Assessment Area (CIAA) for this action is the DDCT analysis area, approximately 63,199.68 acres.

Temporal Scope – 30 years

Past Action	Proposed Action	Total disturbance
664.86 acres disturbance (1.02%)	50 acres disturbance (0.07%)	1.09%, Density 0.03/640acres

DDCT results for the project show that the proposed action would add approximately 20.18 acres of disturbance to PHMAs, accounting for an increase of 0.03% of total disturbance. This is below the threshold of 5% and therefore does not indicate a significant effect.

3.3. Residual Effects

If mitigation measures are not selected or applied appropriately, direct or indirect impacts analyzed may still occur.

A timing limitation does not mitigate loss and fragmentation of habitat or changes in disease mechanisms. In general, the suitability of the project area for wildlife would be affected due to habitat loss and fragmentation, and proximity of human activities associated with fluid mineral development during the life of the project.

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Chapter 4. Tribes, Individuals, Organizations, or Agencies Consulted:

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4.1. List of Persons, Agencies and Organizations Consulted

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
WGFD - Tim Woolley and Bart Kroger	Concurrence on recommended wildlife protections	Concurrence – 11/17/15
SHPO – Mary Hopkins	Wyoming State Protocol	Notify and Proceed

4.2. List of Preparers

Name	Title
Darci Stafford	Natural Resource Specialist, Fluid Minerals
Dora Ridenour	Archaeologist
Tim Stephens	Wildlife Biologist
Leslie Coleman	Natural Resource Specialist, Invasive Species and Soils
Adam Babcock	Recreation/Visual Specialist
Karen Hepp	Range Management Specialist (T&E/Sensitive Plants)
Derek Trauntvein	Range Management Specialist
Jim Critz	Civil Engineer
Monica Goepferd	Civil Engineer
Jared Dalebout	Hydrologist
Gretchen Hurley	Geologist
Connie Craft	Realty Specialist
Eve Warren	Natural Resource Specialist, Fire Ecology
Jim Gates	Forester
Franklin Sanders	Petroleum Engineer
Holly Elliott	Planning & Environmental Coordinator
Amelia Pennington	Assistant Field Manager, Minerals and Lands
John Elliott	Acting Assistant Field Manager, Resources

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Chapter 5. References Cited

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Appendix A. Appendix 1 - Wildlife Resources Map

