

Appendix 3

Alternative A

Refer to Appendix 4 for site-specific measures.

General Design Features

1. Approval of this Application for Permit to Drill (APD) does not warrant that any party holds equitable or legal title.
2. All lease exploration, development, construction, drilling, production, operations, and reclamation activity would be conducted in a manner which conforms to all applicable federal, state, and local laws and regulations.
3. All lease operations are subject to the terms of the lease and its stipulations, the regulations of 43 CFR Part 3100, Onshore Oil and Gas Orders, Notices to Lessees (NTL's), the approved APD, and any written instructions or Orders of the BLM Authorized Officer (AO).
4. The approval of this APD does not grant authority to use off-lease federal lands. Facilities approved by this APD and/or Sundry Notices that are no longer included within the lease, due to a change in the lease or unit boundary would be authorized with a right-of-way. Similarly, should unit or lease boundaries change during the life of the project, the Operator would be responsible for acquiring necessary rights-of-way for affected facilities. Failure to do so may cause the operation to be shut-in.
5. This permit would be valid for a period of two years from the date of APD approval or until lease expiration or termination, whichever is sooner. APD extensions may be requested and granted for up to two additional years, but not to exceed a total sum of four years from the initial APD approval date. Should a permit extension be requested, it must be submitted prior to the permit expiration date via a Sundry Notice (Form 3160-5) to the AO for approval. Extension request received after the expiration date will not be approved. If the permit terminates, any surface disturbance created under the application would be reclaimed in accordance with the approved reclamation plan found herein.
6. The Operator would submit a Sundry Notice (Form 3160-5) to the AO for approval prior to beginning any new surface-disturbing activities or operations that are not specifically addressed and approved by this APD.
7. The Operator may submit to the AO's Representative written requests (including documentation, supporting analysis and an acceptable plan for mitigation of anticipated impacts) for exception, waiver, or modification to this approved APD, associated design features, or other requirements. Such written approval would be obtained prior to commencement of operations that cause any deviation from the approved APD and associated limitations. Emergency approval may be obtained orally, but such approval would not waive the written reporting requirement.
8. At **least 48-hours prior to** beginning any APD related construction (e.g. access road, well pad, pipeline) and/or reclamation activities (e.g. dirt-work, seeding) the operator would notify the BLM via internet notice.
9. All construction of the well pad, flare pit, reserve pit, roads, flow lines, production facilities, and all associated infrastructure on federal lands would be monitored onsite by a licensed professional engineer OR designated qualified inspector (to be named at the time of construction notification) who would serve as the Operator's Compliance Coordinator to ensure construction meets the BLM-approved plans.

10. Within **24-hours** of spudding the well, the spud date would be submitted to the BLM via internet notice. A follow up report on Form 3160-5 confirming the date and time of the actual spud would be submitted to this office within five working days from date of spud.
11. At **least 24-hours in advance** of all BOP tests, running and cementing all casing strings (other than conductor casing), pluggings, DST's and/or other formation tests, and drilling over lease expiration dates, notification would be submitted to the BLM via internet notice.
12. The operator would submit a production facility layout (Onshore Order 1, Section III. D.4.d. and D.4.i., or Section VIII. A.) for approval (prior to construction) which includes permitted location boundaries, production facility placement, access road inlet, and cut/fill slopes.
13. A site facility diagram (Onshore Order 3, Section III. I. and 43 CFR 3162.7-5(d)) for the purpose of a site security plan (Onshore Order 3, Section III. H. and 43 CFR 3162.7-5(c)) would be filed no later than 60 calendar days following first production.
14. Use of any tank heater/burners in production storage tanks must be approved prior to installation and/or use by the AO. Failure to obtain approval for installation/use of tank heater/burners in any production storage tanks may result in a Written Order (WO), Incidence of Non-compliance (INC), assessments and/or potentially a Shut-In Order.
15. No below or partially below ground fluid storage/containment tanks or vessels are to be used without prior approval of the AO. Below or partially below ground fluid storage/containment tanks or vessels would require systems for the prevention, containment, detection, and monitoring of any below ground leakage (e.g. secondary containment and leak detection/monitoring systems, etc.) A production facility layout depicting the proposed vessel construction and installation/location must be submitted for prior approval via APD or Sundry. As applicable, all subsurface vessels must comply with the Wyoming Storage Tank Act of 2007 (W.S. 35-11-14-29) and/or the Wyoming DEQ Underground Injection Control (UIC) Program.
16. No pipelines or flow-lines or related rights-of-way are approved with the APD. Well pipelines or flow-lines and related rights-of-way, including plans of development, must be submitted for approval via Sundry Notice or Right-of-Way Application (SF-299) as applicable, prior to construction.
17. The BLM AO may request and schedule a meeting with the operator or operators representative to discuss the APD and terms and condition of approval. Such a meeting ~~would~~ be held in the BLM offices, within 30 days of the APD approval.
18. The BLM AO may request to schedule a meeting with the operator or operators representative (dirt contractor, construction contractor, surveyors etc.) to discuss construction and related requirements. Such meetings ~~would~~ be held in ~~the~~ BLM office and in the field within 60-90 days prior to surface disturbance and construction. The BLM AO may require surveys and re-stacking of all project construction and disturbance prior to field inspection.

Operations

1. Upon request, Operator must be prepared to provide copies of applications for, and approved copies of, federal, state, and local operating permits.
2. All survey monuments found in the area of operations would be protected. Survey monuments include, but are not limited to: General Land Office and ~~the~~ BLM Cadastral Survey Corners, reference corners, witness points, U.S. Coastal and Geodetic benchmarks and triangulation

stations, military control monuments, and recognizable civil (both public and private) survey monuments. In the event of obliteration or disturbance of any of the above, the Operator would immediately report the incident, in writing, to the AO and the respective installing authority if known. Where General Land Office or the BLM Right-of-Way monuments or references are obliterated during operations, the Operator would secure the services of a registered land surveyor or a BLM cadastral surveyor to restore the disturbed monuments and references using surveying procedures found in the "Manual of Surveying Instructions for the Survey of the Public Lands in the United States," latest edition. The Operator would record such survey in the appropriate county and send a copy to the AO. If the Bureau cadastral surveyors or other federal surveyors are used to restore the disturbed survey monument, the Operator would be responsible for the survey cost.

3. If any cultural values [sites, artifacts, human remains] are observed during operation of this lease/permit/right-of-way, they would be left intact and the AO notified. The AO would conduct an evaluation of the cultural values to establish appropriate mitigation, salvage or treatment. The Operator would be responsible for informing all persons in the area who are associated with this project that they would be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If historic or archaeological materials are uncovered during construction, the Operator would immediately stop work that might further disturb such materials, and contact the AO. Within seven days after the operator contacted the BLM, the AO would inform the Operator as to: whether the materials appear eligible for the National Register of Historic Places; the mitigation measures the Operator would likely have to undertake before the site can be used (assuming in situ preservation is not necessary); and, a time-frame for the AO to complete an expedited review under 36 CFR 800.11 to confirm, through the State Historic Preservation Officer, that the findings of the AO are correct and that mitigation is appropriate. The AO would provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the Operator would be allowed to resume construction.
4. The Operator would be responsible for the cost of any mitigation required by the AO. The AO would provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the Operator would be allowed to resume operations.
5. If paleontological resources, either large or conspicuous, and/or of a significant scientific value are discovered during construction, the find would be reported to the AO immediately. Construction would be suspended within 250 feet of said find. An evaluation of the paleontological discovery would be made by a BLM-approved professional paleontologist within five working days, weather permitting, to determine the appropriate action(s) to prevent the potential loss of any significant paleontological values. Operations within 250 feet of such a discovery would not be resumed until written authorization to proceed is issued by the AO. The Operator would bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operation.
6. The Operator would be responsible for informing all persons associated with this project that they would be subject to prosecution for damaging, altering, excavating or removing any archaeological, historical, or vertebrate fossil objects or site. If archaeological, historical, or vertebrate fossil materials are discovered, the Operator would suspend all operations that further disturb such materials and immediately contact the AO. Operations would not resume until written authorization to proceed is issued by the AO.
7. Within five working days, the AO would evaluate the discovery and inform the Operator of actions that would be necessary to prevent loss of significant cultural or scientific values.
8. The Operator would be responsible for the cost of any mitigation required by the AO. The AO

would provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the Operator would be allowed to resume operations.

9. If any dead or injured threatened, endangered, proposed, or candidate animal species is located during construction or operation, the U.S. Fish and Wildlife Service's Wyoming Field Office (307-772-2374), its law enforcement office (307-261-6365), and the BLM RFO (307-328-4200) would be notified within 24 hours. If any dead or injured sensitive species is located during construction or operation, the RFO would also be notified within 24 hours.
10. If dead or injured raptors, big game, migratory birds, or unusual wildlife are observed on the project area, operator personnel will contact the appropriate BLM and WGFD offices. Under no circumstances will dead or injured wildlife be approached or handled by operator personnel.
11. Operators shall notify the BLM immediately if raptors are found nesting on or within 1,200 feet of project facilities and assist the BLM as necessary in erecting artificial nesting structures (ANSs) as appropriate. The use of ANSs will be considered as a last resort for raptor protection. If nest manipulation or a situation requiring a "taking" of a raptor nest becomes necessary, a special permit will be obtained from the Denver USDI-FWS Office, Permit Section, and will be initiated with sufficient lead time to allow for development of mitigation. Required corresponding permits will be obtained from the WGFD in Cheyenne. Consultation and coordination with the USDI-FWS and WGFD shall be conducted for all protection activities relating to raptors.
12. Operators and Operator's sub-contracted personnel would not intentionally harm or harass wild horses, other wildlife, or domestic livestock.
13. ROW, mineral lease, mining claim, and permit holders would monitor and control noxious and invasive weeds, according to an approved weed management plan, on project-disturbed areas and native areas infested as a direct result of the project. The control methods would be in accordance with guidelines established by the EPA, the BLM, state and local authorities. Prior to the use of pesticides, the Operator would obtain written approval from the AO - meaning an approved Pesticide Use Proposal form - showing the type and quantity of material(s) to be used, pest(s) to be controlled, method of application, etc.
14. Pesticide Use Proposals shall be submitted to and approved by the BLM AO—Weed Coordinator, prior to any application of any herbicide on the BLM lands. Pesticide Use Proposals will be tiered to the approved Reclamation Plan/Weed Management Plan.
15. Copies of daily Pesticide Application Records (required by the State of Wyoming) and Summary Herbicide Use Reports are due monthly to the BLM AO--Weed Coordinator.
16. The Operator would be responsible for the prevention and suppression of fires on public lands caused by its employees, contractors, or its subcontractors. During conditions of extreme fire danger, surface use operations may be either limited or suspended in specific areas, or additional measures may be required by the AO. Should a fire occur, it would be immediately reported to this office by calling 307-328-4200, and notifying the Fluid Minerals staff.
17. Emissions of particulate matter from well pad, road, and other facility construction, operation, and reclamation activities would be minimized by application of water or other dust suppressants. Dust inhibitors (surfacing materials, dust suppressants, and water) would be used as necessary on locations that present a fugitive dust problem. The use of chemical dust suppressants on public surface would require prior approval from the AO.
18. If groundwater or permeable/porous subsoil or bedrock is encountered upon construction of the pad or pits, or upon drilling and completing shallow holes for surface conductor, rat/mouse holes, or water supply well, the Operator must immediately notify the AO's Representative before

proceeding.

19. The Operator would comply with the Hazardous Materials Management Plan/Summary in the RMP ROD (Appendix 32) and/or the appropriate EIS ROD, including requirements to transport, store, utilize, and dispose of hazardous substances. The Operator would maintain a hazardous substances release contingency plan that would include, among other things, provision to notify the AO in the event of any release of hazardous substances associated with project operations. Treatment chemicals may require additional storage and containment measures and facilities depending on chemical classification and hazard.
20. If a portable sewage treatment facility is moved onto location, the well/lease Operator would provide the BLM AO a copy of the facility Operator's notification letter to the Wyoming Department of Environmental Quality. Facility operations would comply with the BLM requirements, including unauthorized discharge notification and reclamation of disturbed surfaces.
21. Only those hazardous wastes that qualify as **exempt**, under the Resource Conservation and Recovery Act (RCRA), Oil and Gas Exemption, may be disposed of in the reserve pit. Generally, oil or gas wastes are exempt if they
 - a. have been sent down hole and then returned to the surface during oil/gas operations involving exploration, development, or production, or
 - b. have been generated during the removal of produced water or other contaminants from the oil/gas production stream. The term hazardous waste, as referred to above, is defined as a listed (40 CFR 261.31-33) or characteristic (40 CFR 261.20-24) hazardous waste under RCRA.
22. Any spilled or leaked oil, produced water or treatment chemicals must be reported in accordance with NTL-3A and immediately cleaned up in accordance with the BLM requirements. This includes clean-up and proper disposition of soils contaminated as a result of such spills/leaks. The Operator would segregate, treat, and/or bio-remediate contaminated soil materials as authorized via Sundry Notice (Form 3160-5) or dispose of contaminated soils at a permitted waste facility. Treatment chemicals may require additional storage and containment measures and facilities depending on chemical classification and hazard.
23. The Operator would install an identification sign consistent with the requirements of 43 CFR 3162.6 immediately upon completion of the well pad/location construction operations.
24. The Operator would contain and remove all debris, unused equipment, and other waste materials not needed for production. Waste materials would be disposed of at an approved disposal facility.
25. Upon APD expiration, it is the responsibility of the Applicant/Operator to see that all stakes, flagging, posts or other materials placed on the locations and/or access roads, pipelines and associated rights-of-way are removed. Operator must immediately cease all operations associated with preparing to drill the well and begin final reclamation activities of all APD related disturbance, pursuant to the approved APD design features and to be completed within six months of the APD expiration date.
26. Employee and contractor education will be conducted regarding wildlife laws. If violations are discovered on the project area, Operators will immediately notify the appropriate agency. Operators will implement policies designed to control off-site activities of personnel, that may result in littering or resource damage.
27. Company and contractor employees operating motorized equipment will undergo training describing the types of wildlife in the area, the circumstances under which collisions are likely to occur, and the measures that can be employed to minimize collisions.

Construction

1. All facilities on location that have the potential to leak/spill oil, glycol, methanol, produced water, condensate, or other fluids which may constitute a hazard to the environment, public health or safety (including, but not limited to, drain sumps, sludge holdings, and chemical containers), would be within secondary containment, impervious to those fluids, exclusive of wildlife and livestock, with animal/bird escape capability, and able to contain a minimum of 110% of the volume of the largest storage vessel, respective to content, or 100% with at least one foot of freeboard, whichever is greater, so that any spill or leakage would not drain, infiltrate, or otherwise escape to ground water, surface water, or navigable waters before cleanup can be completed (within 72 hours).
2. Construction over and/or immediately adjacent to existing pipelines would be coordinated, and in accordance with, the relevant pipeline companies' policy.
3. Fencing would be installed around produced water, oil, and condensate tank batteries in order to help maintain the integrity of the surrounding containment structure and to prevent livestock and wildlife from entering the area in case of a leak or spill.
4. All open vent stack equipment would be designed and constructed to prevent entry by birds and bats and to discourage perching.
5. The immediate repair/replacement (to the BLM standards) of any range infrastructure breached, altered, or damaged by construction, drilling, or operation activities related to this APD would be the responsibility of the Operator. All fence relocations would be in accordance with the BLM approval.
6. Construction, maintenance, and reclamation operations with frozen material or during periods when the soil material is saturated is expressly prohibited. If equipment, including licensed highway vehicles, creates ruts in excess of four (4) inches deep, the soil would be deemed too wet to adequately support maintenance and/or heavy equipment.
7. Accumulated snow present on the ground at the outset of construction, maintenance, or reclamation activities would be removed before the soil is disturbed and piled downhill and/or downwind from the disturbed area. Equipment used for any non-construction snow removal operations would be equipped with 6" shoes to ensure blades do not remove topsoil or vegetation. Written approval must be obtained before snow removal related to a federal action but outside of designated disturbance areas is undertaken.
8. Snow bladed/removed, into drifts/berms would be constructed with a gap of 35 yards every one-quarter mile, to allow unobstructed movement of wildlife, livestock and human activities.
9. If ROW fencing is required, it will be kept to a minimum, and the fences will meet BLM/WGFD approval for facilitating wildlife movement. Wildlife-proof fencing will be used only to enclose areas that are potentially hazardous to wildlife species or reclaimed areas where it is determined that wildlife species are impeding successful vegetation establishment.
10. Snow fences, if used, will be limited to segments of one-quarter mile or less. In addition, escape openings will be provided along roads in big game crucial winter ranges, as designated by the BLM, to facilitate exit of big game animals from snowplowed roads.
11. Clearly remove, segregate, and delineate from all other spoils, all available topsoil from constructed locations and surface disturbances including areas of cut and fill, road, and spoil. Stockpile and clearly identify topsoils at the site for use in reclamation on all areas of surface disturbance (well pads/locations, roads, pipelines, etc.).

12. Plugs or embankments providing wildlife with access out of and across open pipeline trenches would be installed, at minimum, every 1320 linear feet along open pipeline trenches.
13. No construction and/or reclamation would block or change the natural course of any drainage, nor would topsoil, waste, or fill material be deposited below high water lines in riparian areas, flood plains, or in natural drainage ways. The lower edge of soil or other material stockpiles would be located outside active floodplains. All spoils would be placed where they can be retrieved without creating additional surface disturbance and where they do not impede and/or contribute sediment to watershed and drainage flows. The Operator would also reconstruct and stabilize stream channels, drainages, and ephemeral draws to exhibit similar hydrologic characteristics that were found in stable, naturally occurring and functioning systems.
14. Drainage and runoff would be diverted away from all new construction naturally or through the use of spoil material to create berms. All drainage structures would approximate topographic contour lines, have a grade no greater than 0.5 - 1 percent, would release water onto natural undisturbed ground without causing additional accelerated erosion. The use of riprap or other armoring to prevent erosion may be necessary (BLM Manual 9113). Drainage structures shall not discharge directly into/onto natural drainages/channels. Water-bars, waddles, hay bales, and/or silt fences would be used as needed to reduce surface runoff velocity and promote upland sediment deposition, thus reducing drainage/channel sedimentation and erosion.
15. Silt fences, if needed, would be installed after topsoil removal and before pad leveling begins and must remain in place until interim reclamation is complete and there is adequate vegetation present to stabilize the soil. Silt fences would be constructed in locations where surface erosion is evident or potential for surface erosion exists such as areas of steep slopes or highly erosive soils. Fences would be installed at the inside edge of disturbance.
16. Silt fences would be constructed using metal posts that are at least five feet long with at least two feet in the ground (three feet above ground) with eight feet spacing if a wire re-enforcement backing is used or 6 feet spacing if no wire backing is used. The fabric is to be toed into the ground at the base of the fence a minimum of eight inches deep and an 18 inch overlap is required when splicing two fences together. The fabric is to be installed on the uphill side of the metal posts and attached to the posts at least every six inches along the length of the post. Silt fences are to be inspected at least once a month or 48 hours after a rain storm event. If holes in the fence or undercutting of the fence are found, repair is required within 48 hours of discovery. When silt accumulates to a height equal to two-thirds the height of the fabric, the silt is to be cleaned out and deposited on the excess spoils pile.
17. Sediment fences, straw wattles, erosion mats, and/or hay bales should be used to minimize erosion and sediment transport on disturbance area.
18. If temporary surface pipelines, as authorized by the AO, are used to transport water, they would be placed/removed when the ground surface is dry. Surface blading prior to line placement is prohibited. The pipelines must be removed within 30 days after well completion (or determination of inactivity).
19. Construction control stakes would be placed as necessary to ensure construction of the well pad, topsoil stockpile, spoil pile, and outer limits of the area to be disturbed in accordance with the specifications outlined in the APD. The Operator would assume full responsibility for protecting all stakes and offsetting any additional stakes or grades which may be necessary.
20. All production facilities including but not limited to tanks, separators, dehydrators, meters, etc. would be co-located on nearby producing well locations, in accordance with an approved Sundry Notice of Intent for construction. All wells, above-ground structures, production equipment, tanks, transformers, and insulators not subject to coloring requirements for safety would be painted the

color of “non reflective Shale Green”.

21. To protect the identified ferruginous hawk nests, Greater Sage-grouse leks and wintering big game habitat, the project proponent will install housing and/or muffler(s) around equipment that exceeds 55 dBA (ES-7, 4-69, 4-157 AR EIS)
22. Cathodic protection wells would be drilled on the existing well pad, placed so as not to interfere with re-contouring of cut and fill slopes during interim reclamation, designed and constructed to prevent commingling and contamination of water aquifers. The AO would be notified of any water flows at surface and the problem would be resolved promptly.
23. All stacks, exhausters, or vent pipes shall have anti perch cones and vent covers to prevent bat or small bird entry and entrapment.

Roads

1. All access roads and drainage control structures, whether existing or newly-constructed, would be both constructed to resource road standards and regularly maintained in a safe and usable condition as outlined in the BLM Manual, Section 9113. A regular maintenance program may include, but is not limited to, blading, ditching, culvert installation, dust control, and gravel surfacing or other activities as specified by the AO. The Lessee and/or Operator would enter into a maintenance agreement with all other "authorized users" of the common access road(s) to the well site. The costs of road maintenance in dollars, equipment, materials, labor, and other related expenses would be shared proportionally among the "authorized users." Upon request, the AO would be provided copies of any maintenance agreement or agreements.
2. Access roads would be constructed to the BLM Road Standards in such a manner as to minimize cuts and fills, and minimize erosion and sedimentation and maximize reclamation, as determined during the onsite.
3. **Engineered Roads** and/or **culverts** shall be designed in accordance with the Engineered Road Requirements with four copies of the following information submitted to the BLM project NRS for approval, prior to construction.
4. **Engineered Road Requirements**
 - a. Plan, profile and typical cross section.
 - b. Centerline stakes shall be placed in the field, with culvert locations marked on the centerline, for the BLM review before final design approval. In addition, slope stakes shall be placed at the top of the cut and the bottom of the fill for those portions of the road that are engineered. All roadways cuts and fills shall be designed to balance from earthwork within the ROW, or an approved borrow source.
 - c. Perform a “hydrologic analysis” to design culverts sized to pass a 25-year precipitation event with no head developed at the culvert inlet.
 - d. The submitted plans must be signed/certified by a professional engineer and will include any special notes for construction and cut/fill balance notes.
5. All operators and operator’s representative vehicles are restricted to authorized travel routes only and would not use any other access route, e.g.; two-track roads, trails, and pipeline rights-of-way to access the drill/well pad and any ancillary facilities.
6. Two-track roads would not be cut-off as a direct result of construction, maintenance, or reclamation of the well access road or associated well facilities, unless authorized by the BLM.
7. Prior to construction, road(s) would be surveyed and staked with construction control stakes set continuously along the centerline at maximum 100-foot intervals (less where needed to be inter-

visible) and at all tangent and curve control points, fence or utility crossings, and culverts. In addition to centerline stakes, slope stakes would be placed at the top of the cut and the bottom of the fill for those portions of the road that are engineered.

8. Before proposed road construction activities begin the topsoil must be bladed to the side of the road and stockpiled. The topsoil stockpile would be contoured so as to prevent water ponding or flow concentration. Once the borrow ditch and the cut slopes are constructed, cleared vegetative material and topsoil that is windrowed would be spread back onto the cut/fill slopes of the road, removing any windrows or berms remaining at the edge of the road.
9. The minimum travel-way width of the immediate access road would be 14 feet with turnouts at least 10 feet in width. No structure would be allowed to narrow the road top. The inside slope would be 4:1. The bottom of the ditch would be a smooth V with no vertical cut in the bottom. The outside slope would be 2:1 or flatter. After the road is crowned and ditched with a .03 - .05 ft/ft crown the topsoil and windrowed vegetative material would be pulled back down on the cut slope so there is no berm left at the top of the cut slope. Turnouts would be spaced at a maximum distance of 1000 feet and would be intervisible. If the access road crosses a floodplain, the ditch would be flat-bottomed so as to provide material to raise the road, unless otherwise approved by the AO..
10. If soils along the access road route are dry during road construction, use, and/or maintenance, fresh water would be applied to the road surface to facilitate soil compaction and minimize soil loss as a result of wind erosion.
11. Construction and surfacing of the new access road would be complete prior to moving drilling equipment onto the well pad and the presence of heavy vehicular traffic. Compact the top foot of sub-grade in even six to eight (inch lifts to established standards, adding water as needed for compaction. Surface with an appropriate grade of gravel to a minimum depth of four (compacted) inches.
12. All cattle guards would be designed and maintained consistent with BLM standards and would be a minimum of 16 feet wide and 8 feet long; set on either timber, pre-cast concrete, or cast-in-place concrete bases at right angles to the roadway. They shall; have drop down wings on each side and an adjacent 16 foot wide tubular bypass gate; not narrow the road travel surface; and have fence and end panels on either side constructed using three posts with "H" braces.
13. All culverts would be a minimum of 18 inches in diameter. Culverts would have a minimum of 12" of fill or 1/2 the pipe diameter, whichever is greater, placed on top of the culvert, and would be of length sufficient to allow at least 12" of culvert to extend beyond the toe of any slope. The inlet and outlet would be set on grade. No rocks would be used in the bed material and no rocks greater than two inches in diameter would be immediately adjacent to the culvert. The entire length of pipe would be bedded on native material before backfilling, which would be completed using unfrozen material and rocks no larger than two inches in diameter; compact the backfill evenly in six inch lifts on both sides of the culvert. A permanent marker would be installed at both ends of the culvert to help prevent traffic from damaging the culvert. Additional culverts would be placed in the new access road as the need arises or as directed by the AO.
14. Wing-ditches would be staked and constructed at a slope of .5 to 1.0 percent down slope unless otherwise approved by the AO. All wing/drainage ditches and culverts would be kept clear and free-flowing, and would also be maintained in accordance with the original construction standards. Drainage structures would not discharge directly into/onto natural drainages/channels, and/or use riprap or other armoring to protect from erosion (BLM Manual 9113).
15. Low water crossings would be constructed perpendicular to the channel and at original channel elevation in a manner that would not block or restrict existing channel flow. Excavated material would be stockpiled for use in reclamation of the crossings.

Pits

1. All oil and gas well reserve or completion pits that could contain oil based drilling muds, fracture/stimulation fluids, recycled pit fluids, or produced water, except those only containing fresh-water based fluids constituents, are required to be lined with an impermeable liner (12 mil minimum with a permeability less than or equal to 1×10^{-7} cm/sec) . The liner would be physically and chemically-compatible with all substances which it may contact and would be of sufficient strength and thickness to withstand normal installation and use, and installed so that it would not leak. The liner would be installed over a smooth sub-grade, matting, or fill materials (e.g. sifted dirt, sand, or bentonite) free of pockets, loose rocks, and other objects that could damage the liner.
2. The only fluids/waste materials which are authorized to go into reserve pits are RCRA-exempt exploration and production wastes. Any evidence of RCRA non-exempt wastes being put into the reserve pit may result in the BLM AO requiring specific testing and closure requirements.
3. All pits are required to maintain a minimum of two feet of freeboard between the liquid level and the top of the liner. If operations cause fluid levels in pits to rise above the required freeboard, immediate notification would be provided to the AO with concurrent steps taken to cease the introduction of additional fluids, until alternative containment methods can be approved.
4. Flaring of gas into the reserve or completion pits would not be allowed without prior approval from the AO and flaring into lined pits is prohibited.
5. All pits would be kept free of trash, debris, solid wastes, and other unauthorized waste materials including oil and liquid hydrocarbons.
6. For the protection of livestock and wildlife, all pits and open cellars would be fenced on all sides, with corner bracing, immediately upon construction. Reserve, flare, completion, and production pits would be adequately fenced during and after drilling operations until pits are reclaimed so as to effectively keep out wildlife and livestock. Operator would, within ten days of discovery, remove any floating hydrocarbons from pit surface. Approved netting (mesh diameter no larger than one inch) is required over any pit that contains or is identified as containing hydrocarbons or hazardous substances (per RCRA 40 CFR Part 261 or CERCLA Section 101(14) (E)).
7. Pits would be dried, backfilled, and closed within six months from well completion (total depth) or well plugging. Pits must be void of all free fluids prior to backfilling. Pit trenching or squeezing is prohibited. Pits may be dewatered/dried in the following manner: natural evaporation, mechanical aeration, chemical and mechanical solidification (e.g. with fly ash, cement kiln dust, etc.) and/or hauled to an approved DEQ disposal site. The installation/operation of any sprinklers, misters, aerators, pumps, hoses, and related equipment would ensure that water spray or mist does not drift outside of the pit. All other dewatering/drying, removal or disposal methods not listed in the APD and or Design features would have prior written approval from the AO.
8. Pits, once dry, would be backfilled and compacted with a minimum cover of five feet of soil, void of any topsoil, vegetation, large stones, rocks or foreign objects. The pit area would be mounded to allow for settling and to promote positive surface drainage away from the pit. Before backfilling synthetically lined reserve pits, those liner portions remaining above the "mud line" would be cut off as close to the top of the mud surface as possible and disposed of at an approved solid waste disposal facility. The pit bottom and remaining liner would not be trenched, cut, punctured, or perforated.

Fluids

1. All storage, removal and disposal of produced water must be in accordance with and comply with

Onshore Oil and Gas Order No. 7. Produced water must be disposed of at a permitted off-site commercial disposal facility, unless approved otherwise by the BLM AO. The onsite storage/disposal of produced water, in open pits, tin horns, sumps, etc., is not authorized except as follows:

- a. Produced water from the well subsequent to drilling may be disposed of in the approved well site reserve pit (for up to 90 days), and/or
 - b. used for well drilling or completion, upon prior written approval from the AO via approved APD or Sundry. Produced water may be transported and used for drilling/completion operations from approved fee, state, or federal wells/leases to federal wells/leases within the developed field/unit and/or EIS area, subject to WOGCC and the BLM approval.
2. Pit drilling fluids may be transferred from a reserve pit at an approved federal well location to a lined reserve pit at another approved federal well location, for the purpose of drilling the well. Transfer/reuse would only be permitted when transfer is by a lease operator from one or more pits to another pit or pits on the operator's federal lease/unit or adjacent federal lease. Unless approved by this APD, the transfer and reuse of pit drilling fluids would require prior written approval from the AO, via a Sundry Notice (Form 3160-5).
 3. The AO may authorize the use of produced water or reuse of pit drilling fluids for drilling when: 1) surface casing has been set with fresh water through any and all possible fresh water zones, 2) use is for drilling/completion only, and 3) the receiving pit is lined.
 4. Pit fluids may be transferred by a lease operator from one or more pits to another (lined) pit or pits on the operator's federal lease/unit or adjacent federal lease, for the purpose of fluid consolidation and mechanical/chemical drying and disposal. The six month pit closure requirement would apply. Unless approved by this APD, the transfer of pit fluids for consolidation/disposal would require prior written approval from the AO, via a Sundry Notice (Form 3160-5).
 5. Initial operator requests for the transport and use/reuse of produced water or pit drilling fluids or the transfer/consolidation of pit fluids would include: 1) the potential locations/leases in which fluids are to be transferred to and from, and 2) the potential quantity to be moved. Requests would be submitted for prior written approval from the AO via APD or Sundry Notice. Upon completion of transport, use/reuse or consolidation, the specific information on leases, units or locations and quantities transferred would be submitted to the AO, via Sundry Subsequent Report. Transportation of fluids would be along approved haul routes and authorized right-of-ways. Temporary surface pipelines may be authorized by the AO for the transfer of fresh water only, and NOT for produced water or pit fluids.
 6. Drilling water sources/supplies or any changes to drilling water sources/supplies, the fate of drilling/completion fluids, routes and means of fluid transportation/disposal, and location or method of produced water disposal requires prior written approval from the AO via approved APD, Sundry Notice or Right-of-Way (ROW) as applicable. The drilling of water wells on federal lands would require prior BLM approval via APD, Sundry, or ROW as applicable, in addition to State Engineer Office (SEO) approval.

Reclamation

1. Prior to any surface disturbing activity, a reclamation plan shall be submitted. The reclamation plan shall address short-term stabilization to facilitate long-term reclamation. The reclamation plan is considered complete when all the reclamation requirements (described in the BLM and/or RFO Reclamation Policy, RMP) have been addressed, the techniques to meet the reclamation requirements are described in detail, and the BLM concurs with the reclamation plan. Surface disturbance will not be allowed until the reclamation plan is submitted, complete, and approved by the BLM Authorized Officer.

2. Reclamation Plan will include:

- a. Prior to any surface disturbing activities, vegetation inventories shall be conducted on each ecological site and they shall be mapped. At a minimum, vegetation inventories shall be conducted for basal cover and vegetative life form type and frequency (including individual invasive and noxious weed species), and include at least one photograph of each transect. An inventory of 100 to 400 points (depending on the amount and type of vegetative cover) using transects is highly recommended. The inventory method shall be included within the Reclamation Plan for approval.
- b. Prior to any surface disturbing activities, soil surveys, sampling and or testing shall be conducted for soil depth, chemical and physical characteristics. At a minimum the soil shall be tested for texture, electrical conductivity, reactivity, pH, and photographed. At least one photograph at each soil pit is required which also shows the vegetation community it is in. Soil texture and depth is required, in addition to pre-disturbance vegetation inventories, in determining the soil types and associated plant communities/ecological sites and appropriate seed mixes. Soil moisture and density are also valuable tests. An agricultural suitability test should be performed if harsh conditions exist (pH over 8.5, sandy or clayey textures, EC >12 mmhos/cm etc.). In general, test soil at a depth of four to six inches to determine topsoil suitability. If site conditions indicate that a four to six inches sample depth is not feasible, then adjustments should be made and noted in the report. For example if soil is very shallow, less than 10", it may be appropriate to take samples at shallower depths. If the soil is deeper than 20 inches, also sample at 10-12"; adjust sample depth according the results found to determine the depth of topsoil to salvage for reclamation.
- c. Prior to the completion of interim and final reclamation, and prior to seeding, the operator shall again sample and test soils for suitable surface and subsurface physical and chemical properties as per pre-disturbance testing protocol. These tests are to be used by the operator for comparison of the pre-reclamation soils with pre-disturbance soils and evaluation of the suitability of the soils or seedbed for seed germination and potential for vegetative success under the approved reclamation plan.
- d. Prior to the completion of interim and final reclamation and seeding, the Operator shall submit to the BLM AO, via Sundry Subsequent Report (Form 3160-5), the results of all vegetative and soils surveys and tests. Should pre-disturbance and interim/final reclamation test results differ to the extent that the soil requires amendment(s) or the proposed seed mix requires modification to achieve the desired ecological and plant community, the Operator shall submit a revised reclamation plan via Sundry Notice of Intent (NOI) (Form 3160-5). The Sundry NOI shall outline any proposed soil amendments, treatments, additives or modifications, seed mix changes, and other necessary revisions to the reclamation plan.
- e. Provisions to meet Standards and Guidelines for Healthy Rangelands (43 CFR 4180.1) and obtaining desired plant communities.
http://www.blm.gov/wy/st/en/field_offices/Rawlins/range.html
- f. Mitigation for direct, indirect, and cumulative livestock forage losses and impacts to livestock grazing (including impacts to livestock operations and production performance). This could include reclamation that would replace forage losses from surface disturbing activities, avoiding trailing routes and livestock gathering areas, and seasonal restrictions (such as during lambing and calving in specific areas).

3. The annual monitoring report will be summated by March 1 of each year. This report shall include reclamation and restoration efforts, including seeding/re-vegetation, invasive plant

treatment/control, and soil stabilization and erosion prevention. The report shall be in accordance and consistent with the BLM and/or RFO Reclamation Policy, RFO RMP Record of Decision (ROD) and Appendix 36, and the field/project level EA/EIS, as applicable. The yearly operator report would include surface disturbance and reclamation data for the previous calendar year, utilizing the BLM Rawlins Field Office Disturbance (As-Built) Reclamation Database. The RFO surface disturbance and reclamation database, as well as information on the database and submission of the data, will be available at: http://www.blm.gov/wy/st/en/field_offices/Rawlins/oil_and_gas.html, or by contacting the Rawlins Field Office, Minerals and Lands, Supervisory Natural Resource Specialist/Physical Scientist at 307-328-4200 for further information.

4. Reclamation plans and procedures, including those for seeding/re-vegetation and weed control, shall be modified and revised as necessary in order to achieve desired results and requirements.
5. Reclamation earthwork for interim and/or final reclamation would be completed within six months of well completion or well plugging (weather permitting), and would be consistent with the approved reclamation plan.
6. Would Include
 - a. Backfilling pits
 - b. Re-contouring and stabilizing the well site, access road, cut/fill slopes, drainage channels, utility and pipeline corridors, and all other disturbed areas, to approximately the original contour, shape, function, and configuration that existed before construction (any compacted backfilling activities would ensure proper spoils placement, settling, and stabilization)
 - c. Surface ripping, prior to topsoil placement, to a depth of 18-24 inches deep on 18-24 inch centers to reduce compaction
 - d. Final grading and replacement of topsoil
 - e. Surface-roughening and other techniques such as snow fencing to increase soil moisture retention and reduce compaction. Surface soil material can be pitted or roughened (not exceeding the applied topsoil depth) such that the entire reclamation area would be uniformly covered with depressions constructed perpendicular to the natural flow of water and/or prevailing wind
 - f. Seeding
7. Interim or final reclamation of all surface disturbed areas would commence and be completed within one year of initial disturbance unless needed for well production operations, or otherwise approved by the AO. Interim reclamation for those areas not needed for production operations, including unnecessary access roads and pipeline right(s)-of-way, would commence and be completed within six months of well completion. Stockpiled soils would be distributed on disturbed areas and the production pad would be as small as possible to allow for safe and prudent production operations. Some topsoil may be reserved for final reclamation.
8. Any topsoil to be stockpiled for longer than one year would be spread in layers not to exceed two feet maximum thickness, including topsoil underneath the pile, and appropriately identified/signed as topsoil. These soil stockpiles would be seeded with a prescribed seed mixture or sterile cover crop (located within the approved reclamation plan) and covered with mulch to reduce erosion and discourage weed invasion.
9. Temporary fencing of the reclaimed well/facilities locations for the first two growing seasons after either interim or final seeding may be required to exclude livestock and wildlife and to help ensure better re-vegetation success.
10. Any subsequent re-disturbance of reclamation would be reclaimed within six months by the same means described in the approved reclamation plan.

11. A Notice of Intent to Abandon (Form 3160-5) must be submitted and approved prior to any well abandonment activities. A joint inspection of the disturbed areas may be required and attended by the BLM and the Operator (or Operator's Designee), the primary purpose of which is to review and agree to the existing (or a new) abandonment and/or final reclamation plan. Earthwork must commence and be completed within six (6) months from the date of plugging and abandonment and seeding no later than the next immediate growing season upon the completion of earthwork. All reclamation should be accomplished as soon as possible after the disturbance occurs, with efforts continuing until a satisfactory revegetation cover is established and the site is stabilized three to five years (RMP ROD Appendix 13-8).
12. The Operator would submit a Final Abandonment Notice (FAN), using Form 3160-5, to the AO when adequate reclamation of surface-disturbed areas has been completed. This FAN indicates that the Operator believes the location is considered ready for final inspection, with adequate vegetation cover and species diversity. Upon receipt of the FAN, the BLM would conduct a field inspection prior to releasing the bond liability for this location.
13. Re-vegetation would consist of species occurring in the surrounding natural vegetation and/or included in the approved seed mix as deemed desirable by the BLM or private surface owner in review and approval of the reclamation plan. Inter-seeding, secondary seeding, or staggered seeding may be required to accomplish re-vegetation objectives. The seed mixture(s) would be planted in the amounts specified in pounds of pure live seed (PLS)/acre. There would be no primary or secondary noxious weed seed in the seed mixture. Seed would be tested and the viability testing of seed would be done in accordance with State law(s) and within nine months prior to purchase. 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 AO. Since seeds are of different sizes and require different planting depths, the Operator would use the appropriate equipment to ensure that the seed mixture is correctly and uniformly planted over the disturbed area. Seed would be broadcast if drilling is not possible. When broadcasting the seed, the pounds per acre are to be doubled. The seeding would be repeated until a satisfactory stand is established as determined by the AO.
14. All practicable measures would be utilized to minimize erosion and stabilize disturbed soils on or adjacent to the disturbed and reclaimed area. There would be no evidence of mass-wasting, head-cutting, large rills, gullies, down cutting or overall slope instability. Should the use or storage of hay, straw, or mulch be necessary, the Operator is required to use certified weed-free hay, straw, and mulch on the BLM lands.