

Appendix B
Reclamation Plan

Reclamation Plan for the Southam Canyon Project Area

Onshore Oil and Gas Order Number 1 (72 FR 10328, issued under 43 CFR 3160), which applies to all onshore Federal leases, requires all that APD packages include a Surface Use Plan of Operations and Plans for Surface Reclamation. Section III.D.4.j of Onshore Oil and Gas Order Number 1 requires that reclamation plans include, as appropriate, the following: configuration of the reshaped topography, drainage systems, segregation of spoil materials (stockpiles, backfill requirements, redistribution of topsoil, soil treatments, seeding or other steps to reestablish vegetation, weed control, and reclamation of all disturbed areas. This Reclamation Plan for the SCPA, which relies on the *Surface Operating Standards for Oil and Gas Exploration and Development* or “Goldbook” (BLM and USFS 2007) for guidelines, was prepared to address those requirements.

This Reclamation Plan outlines measures that would be taken to reclaim areas that would be disturbed by the implementation of the development proposed by Enduring in the SCPA. The objectives of this reclamation plan are to re-establish vegetation, reduce dust and erosion, compliment the visual resources of the surrounding area, and generally minimize impacts to the environment.

Section III.D.4.j of Onshore Oil and Gas Order Number 1 and the “Gold Book” call for both interim and final reclamation (BLM and USFS 2007). Interim reclamation refers to measures applied to stabilize disturbed areas and to control runoff and erosion during time periods when application of final reclamation measures is not feasible or practicable. Interim reclamation would be implemented on all disturbed areas that are not needed for production activities (this includes unused portions of road and pipeline ROWs, well pads, compressor stations, and any other disturbed areas). Final reclamation refers to measures that would be applied after well abandonment and at the end of the project. Earthwork for final and interim reclamation would be completed within 6 months of well completion or well plugging (weather permitting) (72 FR 10328). The lifespan of individual producing wells may vary; however, for the purposes of this EA, the lifespan was assumed to be 30 years.

The reclamation plan follows the progression of proposed activities, which would occur in three main phases: 1) drilling and construction of facilities; 2) production and maintenance; and 3) decommissioning and reclamation. Reclamation activities that would occur during or following each of the three phases are discussed below.

Phase I: Construction, Drilling, and Completion

Surface Disturbance:

- All surface disturbance would be kept to a minimum (i.e. existing roads would be utilized where possible, well pads would be constructed to minimize the size of the pad, while allowing for safe construction, drilling, and completion activities).

Noxious Weeds:

- Prior to surface disturbance, a weed inventory of areas proposed for disturbance would be conducted.
- To reduce the spread/introduction of noxious and invasive weed species via project-related vehicles and equipment, Enduring and its subcontractors would power-wash all construction equipment and vehicles entering the Project Area from outside the Uinta Basin.

Fugitive Dust Control

- Enduring would use water or other approved dust suppressants in the Project Area during construction and installation activities, as necessary, to abate fugitive dust.

Topsoil and Surface Preparations:

- At all construction sites, topsoil would be stockpiled separately from other soil materials and maintained for future use in rehabilitating the location.
- After well completion, salvaged topsoil would be evenly re-spread over disturbed surfaces not actively used during the production phase. As directed by the AO, topsoil would be spread as thinly as possible in order to preserve soil microorganisms.

Reserve Pit Reclamation:

- After well completion, reserve pits would be refilled. Prior to filling, reserve pits would be dry and free of oil and other liquid or solid wastes. The pit would be refilled with previously excavated subsoil.

Interim Revegetation:

- After well completion, all disturbed areas not needed for the operation of the well would be reseeded. The seed mixtures to be used would be similar to the vegetation of the surrounding areas and may consist of grasses, forbs, or shrubs. Two recommended seed mixtures are provided in **Tables 1 and 2**. The seed mixture in **Table 1** would be used in the Wyoming big sagebrush vegetation community, and the seed mixture in **Table 2** would be used in the pinyon-juniper vegetation community.
- The seeding contractor would keep all seed tags and provide them to the BLM authorized officer or appropriate SMA.
- Private and State lands would be seeded with a similar seed mixture, unless the landowner requests a different seed mixture.
- Seeding would occur in the fall (August – December).
- Depending on topography and/or timing, seeding can be accomplished either by drill seeding or broadcasting. If the broadcast method is used, the seed rates established for drill seeding would be doubled and seed would be immediately covered to prevent seed desiccation or predation by birds or rodents. The seeds could be covered in several ways including spreading and crimping straw over the seeded area, raking the area by hand, or dragging a chain or chain-linked fence over the seeded area.
- The appropriate SMA would be notified 48 hours in advance of when seeding operations are to commence.
- Erosion control mats would be placed on areas having slopes greater than 40%.

Phase II: Production and Maintenance

Access:

- If necessary for safe access and operation during production, gravel or similar reinforcing material would be used on access routes and necessary portions of well pads (such as in clay soils) to stabilize these areas.

Noxious and Invasive Weeds:

- Enduring would annually inspect well pads and ROWs to identify, treat and control any noxious weed infestations. Any herbicide application on BLM lands would be applied in accordance with the BLM approved Pesticide Use Proposal (PUP). A list of noxious weeds would be obtained from the BLM or the appropriate County Extension Office.

Fugitive Dust Control:

- Enduring would use water or other approved dust suppressants in the Project Area during construction and installation activities, as necessary, to abate fugitive dust.

Revegetation

- Revegetated areas will be inspected regularly to document location and extent of areas with successful revegetation, and areas needing further reclamation. Success criteria would be determined by the BLM or appropriate SMA.
- Areas that do not meet the success criteria two growing seasons after seeding, would be reseeded as directed by the AO. At that time additional treatments, such as soil amendments or irrigation, would be considered and applied, as directed by the AO.

Phase III: Decommissioning and Reclamation

Plugging the Well:

- Prior to well abandonment, the operator shall submit and receive approval for the Sundry Notices and Reports on Wells (Form 3160-5) from the Authorized Officer.

Topsoil and Final Surface Preparation:

- After well plugging, all disturbed areas would be re-contoured back to the original contour or a contour that blends with the surrounding landform (roads must also be reclaimed unless the appropriate SMA or surface owner requests that they be left unreclaimed).
- To achieve final reclamation of an area previously reclaimed using interim reclamation methods, all topsoil and vegetation must be restripped from areas that were not previously reshaped.
- The appropriate SMA would determine if any gravel or similar materials used to reinforce an area are to be removed or buried in place during final reclamation.
- Salvaged topsoil would be respread evenly over the surfaces to be revegetated.
- The soil surface would be prepared to provide a seedbed for re-establishment of desirable vegetation. Site preparation may include gouging, scarifying, dozer track-walking, mulching, or fertilizing. The seedbed preparations would be determined by the appropriate SMA at the time of final reclamation.

Final Revegetation:

- All disturbed and recontoured areas would be reseeded using techniques outlined under Phase I and II of this project. The seed mixtures to be used would be similar to the vegetation of the surrounding areas and may consist of grasses, forbs, or shrubs. **Tables 1 and 2** provide recommended seed mixtures. The seed mixture in **Table 1** would be used in the Wyoming big sagebrush vegetation community, and the seed mixture in **Table 2** would be used in the pinyon-juniper vegetation community. Final determination of the appropriate seed mixture would be developed by the appropriate SMA on a site-specific basis at the time of field review of the facility.

- Compacted soil areas may need to be ripped and regraded.
- Final revegetation and reclamation success would be determined by the appropriate SMA.

Table 1. Wyoming Big Sagebrush Vegetation Community Seed Mixture		
Common Name	Scientific Name	Rate ^{1,2}
GRASSES		
Crested wheatgrass	<i>Agropyron cristatum</i> 'Hycrest' ³	1.0 lbs/acre
Bottlebrush Squirreltail	<i>Elymus elymoides</i>	1.0 lbs/acre
Sand Dropseed	<i>Sporobolus cryptandrus</i>	1.0 lbs/acre
Western Wheatgrass	<i>Pascopyrum smithii</i>	1.0 lbs/acre
Needle and Threadgrass	<i>Stipa comata</i>	1.0 lbs/acre
FORBS		
Globemallow	<i>Sphaeralcea parvifolia</i>	1.0 lbs/acre
Yellow beeplant	<i>Cleome lutea</i>	0.5 lbs/acre
Shaggy fleabane	<i>Erigeron pumilus</i>	0.5 lbs/acre
Hoary Aster	<i>Machaeranthera canescens</i>	0.5 lbs/acre
SHRUBS		
Wyoming sagebrush ⁴	<i>Artemisia tridentate v. wyomingensis</i>	2.0 lbs/acre
Shadscale	<i>Atriplex confertifolia</i>	2.0 lbs/acre
Forage Kochia ⁴	<i>Kochia prostrata</i>	0.5 lbs/acre
Fourwing saltbush	<i>Atriplex canescens</i>	0.5 lbs/acre
Pure Live Seed Total		12.5 lbs/acre

¹ Rate numbers are in Pure Live Seed (PLS).

² Seed rates are specific to the drill seeder method. If broadcasting is used to disperse the seed, the seed rates above should be doubled.

³ Either Hycrest variety will be used, or a more drought tolerant variety

⁴ This species will be broadcast on the surface and left uncovered after the other seed is either drill seeded or broadcast and covered. It is important to keep seeds of this species uncovered.

Table 2. Pinyon-Juniper Vegetation Community Seed Mixture		
Common Name	Scientific Name	Rate ^{1,2}
GRASSES		
Crested wheatgrass	<i>Agropyron cristatum</i> 'Hycrest' ³	1.5 lbs/acre
Bottlebrush Squirreltail	<i>Elymus elymoides</i>	1.5 lbs/acre
Western Wheatgrass	<i>Pascopyrum smithii</i>	1.0 lbs/acre
Needle and Threadgrass	<i>Stipa comata</i>	1.0 lbs/acre
FORBS		
Globemallow	<i>Sphaeralcea parvifolia</i>	0.5 lbs/acre
Evening Primrose	<i>Oenothera caespitosa</i>	0.5 lbs/acre
Shaggy fleabane	<i>Erigeron pumilus</i>	0.5 lbs/acre
Hoary Aster	<i>Machaeranthera canescens</i>	0.5 lbs/acre
SHRUBS		
Wyoming sagebrush ⁴	<i>Artemisia tridentate v. wyomingensis</i>	2.0 lbs/acre
Black sagebrush ⁴	<i>Artemisia nova</i>	1.0 lbs/acre

Table 2. Pinyon-Juniper Vegetation Community Seed Mixture		
Common Name	Scientific Name	Rate ^{1,2}
Forage Kochia ⁴	<i>Kochia prostrata</i>	1.0 lbs/acre
Pure Live Seed Total		11.0 lbs/acre

¹ Rate numbers are in Pure Live Seed (PLS).

² Seed rates are specific to the drill seeder method. If broadcasting is used to disperse the seed, the seed rates above should be doubled.

³ Either Hycrest variety will be used, or a more drought tolerant variety

⁴ This species will be broadcast on the surface and left uncovered after the other seed is either drill seeded or broadcast and covered. It is important to keep seeds of this species uncovered.

References Cited

Bureau of Land Management and U.S. Forest Service. 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development.

