ENVIRONMENTAL ASSESSMENT

Bentonite Performance Minerals (BPM)

Amendment 7 Plan of Operations for Bentonite Mining: WYW-165988

May 2017

"The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands."

BLM/WY/PL-16/014+1330

DOI-BLM-WY-R020-2016-0086-EA

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1.0 INTRODUCTION

1.1 Background

Bentonite Performance Minerals, LLC (BPM) has submitted to the Cody Field Office of the Bureau of Land Management (BLM-CYFO) the "Amendment 7 Plan of Operations" seeking approval to expand their mining operations northwest and southeast of Lovell, Wyoming (Figures 1-2). This Plan would add a total of 434.59 acres of new mining disturbance within BPM's existing Wyoming Department of Environmental Quality – Land Quality Division (WDEQ-LQD) Permit PT-246C located in Big Horn County, Wyoming, over the life of the operation. Of the 434.59 acres of proposed new disturbance, 123.46 acres would be located on BLM-administered land east of the Bighorn River (administered under the regulations at 43 CFR 3809). A total of 172.96 acres of new mining would be located on patented land (Carr property), and 138.17 acres would be located on State of Wyoming land (Cowley State Section), totaling 303.34 acres of new mining west of the Bighorn River.

Table 1. Proposed Disturbance Acreages by Land Owner – BPM A-7 Plan of Operations

Proposed Disturbance Acreages by Land Owner

Pit Areas	Pit Area Acres			
	Private	Federal Surface	State	Total By Pit Area
Black Gulch	7.79	6.13	0	13.92
G' Claims	0	99.80	0	99.80
Claim A1	0	17.53	0	17.53
Carr Areas	165.17	0	0	165.17
Cowley SS	0	0	138.17	138.17
TOTALS	**172.96**	**123.46**	**138.17**	**434.59**

BPM was first issued Permit PT-246C by the WDEQ-LQD in the late 1970's. Since that time, numerous amendments and updates to the permit have been approved by the WDEQ-LQD. BPM began construction of the Lovell, Wyoming Plant in 1979. Mining operations began in the late 1970's and were conducted by other bentonite companies. In 1981, the Lovell Plant opened for production, but in 1986, the facility was closed. Between 1988 and 1991, Wyo-Ben and Black Hills Bentonite Companies conducted mining and reclamation activities on BPM's permit area. During 1994, limited mining was conducted by BPM in preparation for the plant reopening in 1995. Currently, full scale mining activities are in progress.

1.2 Purpose and Need

The purpose of the Proposed Action is to undertake mining activities necessary to develop bentonite products. The need for this project is established by the BLM's responsibility to administer the rights of entry and use under the Mining Laws (1872), as amended, and the requirements in the regulations at 43 CFR (Code of Federal Regulations) 3809 to review the Plan of Operations to ensure prevention of unnecessary or undue degradation, as well as to ensure that proper reclamation bonding is in place.

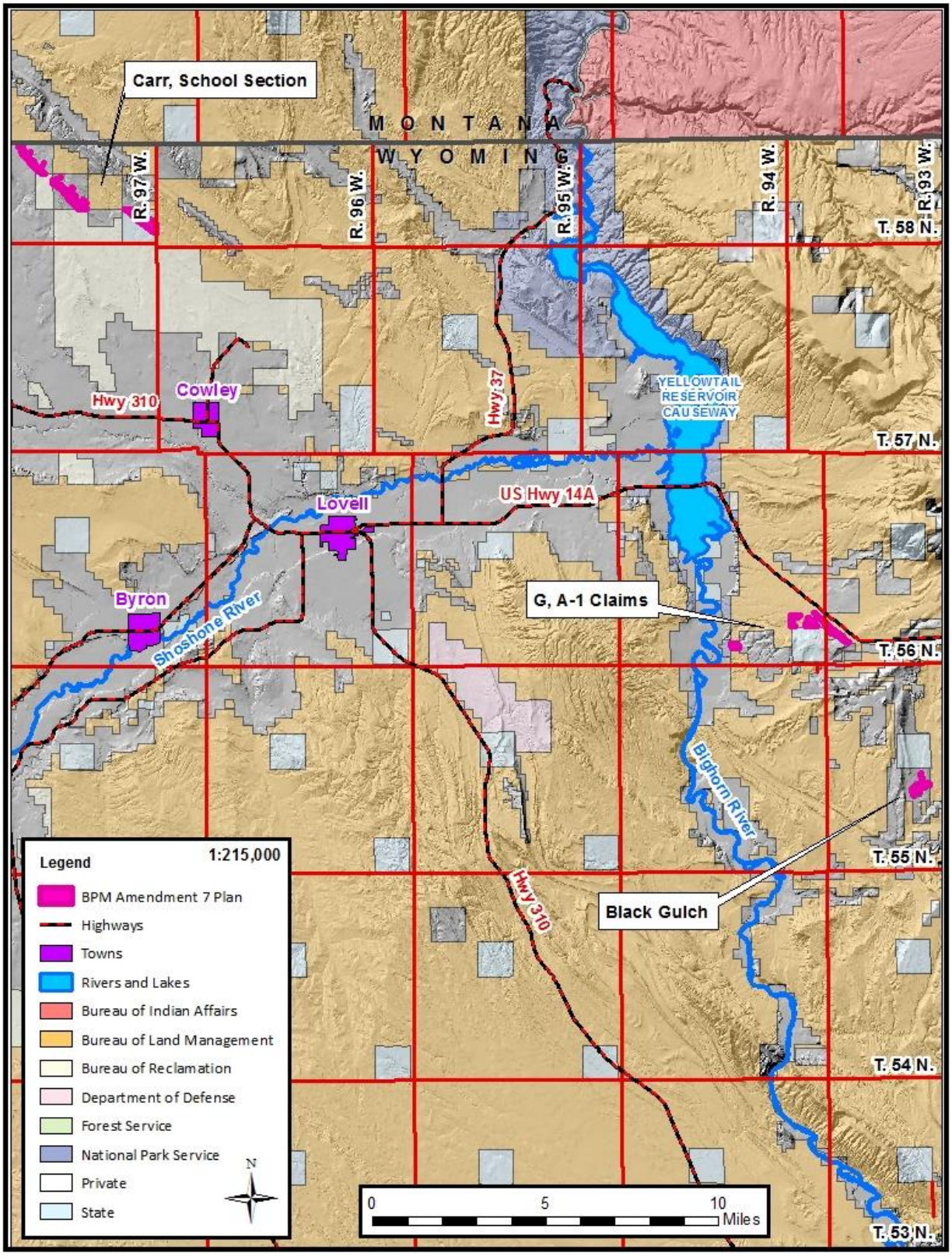


Figure 1. General Location Map of BPM's Amendment 7 to Permit 246C: Area map for the School Section and Carr areas west of the Bighorn River; and the A-1 Claim, Black Gulch and G-Claims areas east of the Bighorn River, Big Horn County, WY. Areas proposed for mining and related disturbance are shaded in red and analyzed in this EA.

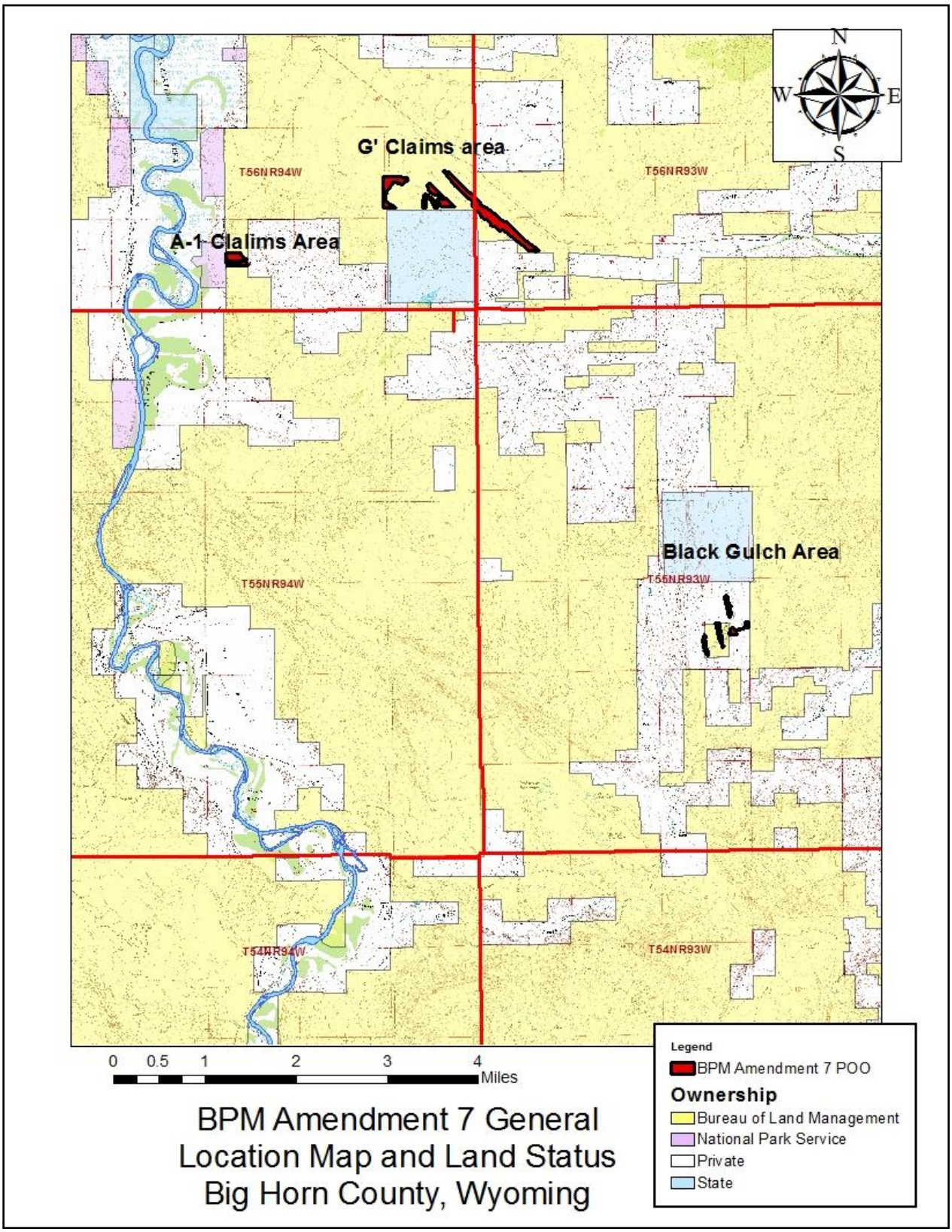


Figure 2. BPM Amendment 7 to Permit 246C: Area map for the A-1 Claim, Black Gulch and G-Claims areas, BLM-administered lands, Big Horn County, WY. Areas proposed for mining and related disturbance are shaded in red and analyzed in this EA.

Decision to be Made

The Authorized Officer (AO, the BLM Cody Field Manager) must determine whether or not to authorize the Proposed Action on BLM-administered public lands, and whether additional mitigation measures and stipulations are required.

1.3 Issues identified during scoping

Internal scoping was conducted in the BLM CYFO by an interdisciplinary team. Internal scoping identified several resource concerns that need to be addressed in the analysis. No unusual environmental issues were identified relative to the proposed mine plan. Internal scoping resulted primarily in the following BLM specialist concerns and comments:

1) Air quality could be affected by dust and exhaust generated by the burning of fossil fuels associated with bentonite mining.
2) Bentonite mining could lead to an increase in sedimentation and run-off into nearby surface waters and temporarily alter surface water hydrology in mining areas.
3) Area soils would be disturbed and altered by the proposed mining.
4) Revegetation of mined areas could be difficult due to changes in post-mining soil characteristics and the presence of invasive weeds. Only native seeds should be used in the reclamation mix or mixes.
5) Invasive weed species could spread as a result of mining-related disturbances.
6) One Bald Eagle nest is present within one mile of the A-1 Claim area east of the Bighorn River. This nest should be monitored for activity and mining should occur outside the nesting season if possible.
7) Disturbance caused by the proposed bentonite mining would affect suitable habitat for migratory birds. Mountain plover occur in the area and surveys should be conducted prior to mining to avoid causing harm to this species.
8) Bentonite mining would affect wildlife habitat and use in the proposed mining area. In particular sage grouse general habitat and connectivity in the area would be impacted. A pre-mining raptor survey for the A-7 areas should be conducted.
9) Trespass livestock issues may increase if existing fences or natural barriers that act as allotment boundaries in the proposed Modification area were not maintained or kept in operating condition.
10) The proposed mining would cause a temporary loss of forage for livestock and wildlife until vegetation is reestablished.

1.4 Relationship to Statutes, Regulations, Policies, Plans or Other Environmental Analyses

This Plan of Operations has been reviewed to determine if the Proposed Action conforms with the Cody Field Office Approved Resource Management Plan, approved as a component of the Record of Decision (ROD) for the Rocky Mountain Region (September 2015). The Proposed Action is specifically supported by Record 2002 which states, "Lands not formally withdrawn or segregated from mineral entry are available for mineral entry for bentonite, gypsum, and other locatable minerals." The areas proposed for new mining under this Plan of Operations have not been withdrawn from mineral entry, therefore, the lands are open to mining claim location and subsequent mineral development after proper review and approval.

Under the General Mining Law of 1872, the Surface Resources Act of 1955, the Federal Land Policy and Management Act of 1976, and the surface management regulations at 43 CFR § 3809, the BLM is required to review Plans of Operation for compliance with the regulations, and to ensure the mining plan would not cause unnecessary and undue degradation as defined in 43 CFR 3809.5.

The BLM and WDEQ-LQD jointly permit and regulate the mining of bentonite and other locatable minerals as outlined in the 2003 supplement to the general statewide Memorandum of Understanding (MOU), No. WY 19, dated October 1975 between the Governor of Wyoming and the Wyoming BLM (Supplement, 2003). The WDEQ-LQD administers and enforces all state statutes and regulations on land disturbances dealing with mining and reclamation within Wyoming. The WDEQ-LQD has the authority to require permitting and licensing of all operator actions in surface mines. Each mine and mine permit area is required by statute and regulation to be covered by a reclamation bond in the event the operator is unable to fulfill reclamation requirements. BPM is covered by such a bond, which is reviewed annually by the WDEQ-LQD and the BLM to ensure it is adequate to cover reclamation of all mining disturbance. The WDEQ-LQD's authority is derived from the Wyoming Environmental Quality Act. The WDEQ-LQD permits non-coal mines under the LQD Non-Coal regulations which are related to Article 4 of the Wyoming Environmental Quality Act (W.S. 35-11-401 through 437).

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Alternative I – Proposed Action

Under the Proposed Action, A-7 mining activity would disturb up to 434.54 acres in five (5) different areas on public, private, and state lands. The proposed disturbance on BLM-administered land under the A-7 Plan of Operations totals 123.46 acres on three areas (~28% of the total disturbance). The balance of mining disturbance would take place on patented (~40%) or state (~32%) lands in two other areas. A concise description of the Proposed Action is provided in this section. Detailed descriptions of the proposed mine and reclamation plans, with more information on how BPM would prevent unnecessary and undue degradation, are provided in Appendix B. *Please Note: Mitigation and Monitoring Measures proposed by BPM, as well as stipulations required by BLM, are part of the Proposed Action, and are provided in Chapter 4, Section 4.4.3.*

A. Operator Information and Equipment

The operator for the Proposed Action is Bentonite Performance Minerals, P.O. Box 547, Lovell, WY 82431. Bentonite is mined using various pieces of equipment dependent on the nature and thickness of the ore deposit. Equipment utilized includes scrapers, trackhoes, loaders, off-highway trucks, and haul trucks. BPM and its contractors normally conduct mining operations with some combination of the following equipment (subject to change):

D-8N, D10N, & D11N Caterpillar dozers
Caterpillar 627D, 627E, 637E & 637D scrapers
Caterpillar 988 front-end loaders
Caterpillar 14G patrol/blade
Track-hoe excavator
Caterpillar 769C Trucks
375A Komatsu dozer
600 Komatsu
Highway Tractor-Trailer Haul Trucks
Water trucks

B. Mine Plan

The unpatented mining claims involved in the A-7 Plan of Operations are listed in Table 2, below. BLM-administered public lands proposed for new mining disturbance are also illustrated in Figures 1-2. The A-7 Plan of Operations would be implemented over a period of 15-20 years, depending on market conditions.

Table 2. Unpatented Mining Claims and Legal Descriptions – BLM Administered Lands Only

Tabulation of Federal Lands Included in Amendment 7

Claim	Serial No.	Ownership	Legal Description	Total Acres	Disturbed Acres
Black Gulch Area					
A59	WMC-4348	BLM	N1/2NW1/4SE1/4, Sec. 21, T55N, R93W	20	2.25
A60	WMC-4349	BLM	S1/2NW1/4SE1/4, Sec. 21, T55N, R93W	20	2.87
A61	WMC-4350	BLM	N1/2SW1/4SE1/4, Sec. 21, T55N, R93W	20	1.01
				Total Acres	6.13
'G' Claims Area					
G1A	WMC-295017	BLM	S1/2NW1/4SW1/4, Sec. 25, T56N, R94W	20	3.95
G1B	WMC-295018	BLM	S1/2NE1/4SW1/4, Sec. 25, T56N, R94W	20	0.51
G1C	WMC-295019	BLM	S1/2NW1/4SE1/4, Sec. 25, T56N, R94W	20	4.65
G1D	WMC-295020	BLM	S1/2NE1/4SE1/4, Sec. 25, T56N, R94W	20	7.09
G1E	WMC-295021	BLM	N1/2NE1/4SE1/4, Sec. 25, T56N, R94W	20	1.95
G1F	WMC-295022	BLM	N1/2NW1/4SE1/4, Sec. 25, T56N, R94W	20	1.62
G1H	WMC-295023	BLM	N1/2NW1/4SW1/4, Sec. 25, T56N, R94W	20	10.63
G1M	WMC-295024	BLM	W1/2 Lot 2, Sec. 25, T56N, R94W	23.26	5.98
G1N	WMC-295025	BLM	E1/2 Lot 2, Sec. 25, T56N, R94W	23.36	3.45
G1O	WMC-295026	BLM	W1/2 Lot 1, Sec. 25, T56N, R94W	23.44	10.54
G1P	WMC-295027	BLM	E1/2 Lot 1, Sec. 25, T56N, R94W	23.54	5.94
G2A	WMC-295334	BLM	N1/2 Lot 1, Sec. 31, T56N, R93W	20	8.39
G2C	WMC-295335	BLM	S1/2NE1/4NW1/4, Sec. 31, T56N, R93W	20	8.25
G2D	WMC-295336	BLM	S1/2NW1/4NE1/4, Sec. 31, T56N, R93W	20	0.72
G2E	WMC-295337	BLM	N1/2SW1/4NE1/4, Sec. 31, T56N, R93W	20	7.29
G2G	WMC-295339	BLM	N1/2NE1/4NW1/4, Sec. 31, T56N, R93W	20	6.50
G3A	WMC-295340	BLM	S1/2 Lot 4, Sec. 30, T56N, R93W	18	9.72
G3B	WMC-295341	BLM	N1/2 Lot 4, Sec. 30, T56N, R93W	18	2.60
				Total Acres	99.80
Claim A1 Area					
A1	WMC-119725	BLM	S1/2SE1/4NW1/4, Sec. 34, T56N, R94W	20	17.53

BPM mines bentonite using the castback mining method (Figure 3). Each pit series begins with an initial pit. Topsoil and subsoil from the initial pit is moved with scrapers and stockpiled adjacent to the pit series or live spread on adjacent mined areas. Overburden (layers of rock above the bentonite bed), and interburden (layers of rock between bentonite beds), are then processed for removal from the pit. BPM uses bulldozers to rip the overburden and scrapers to separate and salvage topsoil and subsoil. Once the initial pit has been mined the next pit is initiated and topsoil/subsoil are either stockpiled or live-spread. Overburden from the second pit is cast back into the initial pit. Topsoil and subsoil from the third pit is then directly placed on the previously contoured initial pit. This process continues until the final pit has been mined, after which it is contoured into the surrounding topography. Stockpiled topsoil and subsoil are then replaced over the final pit in the series, and all topsoiled areas are reseeded.

The final pit in a series is typically reclaimed with subsoil and topsoil material from the initial pit or subsequent pits in the series. Topsoil and subsoil stockpiles are marked with signs reading "TOPSOIL" or "SUBSOIL".

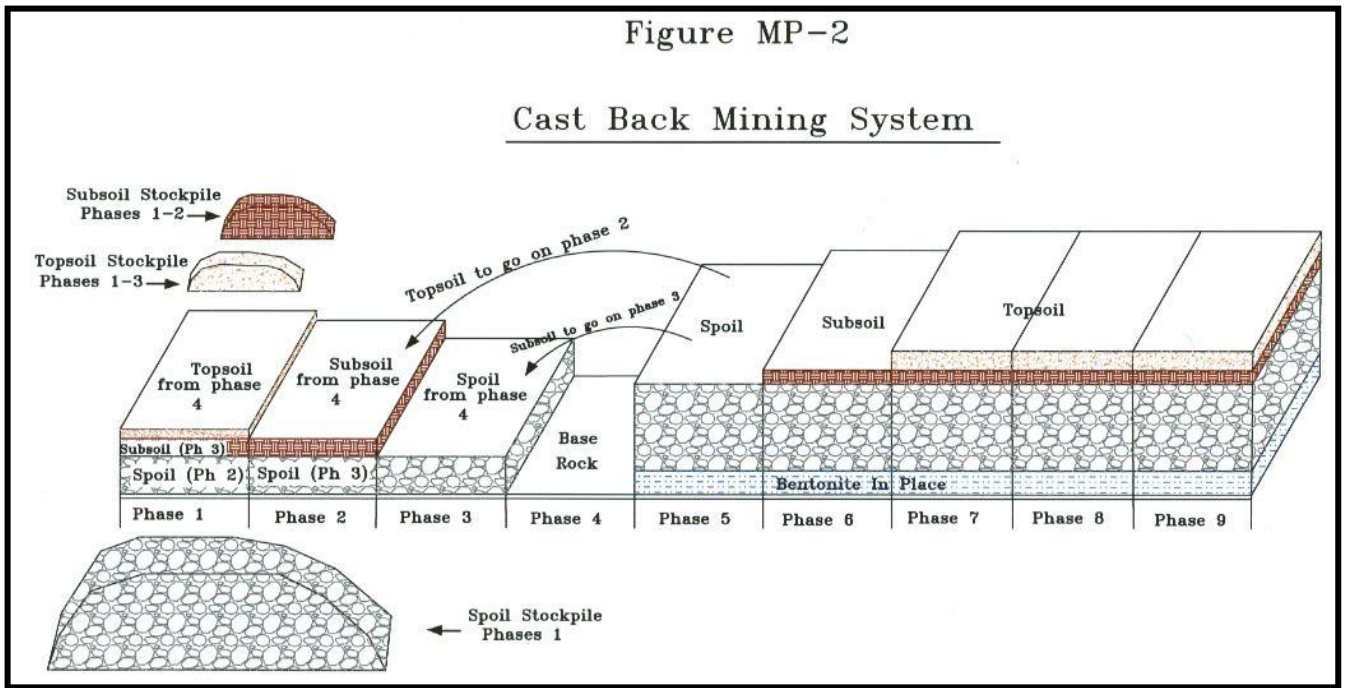


Figure 3. Schematic of a castback mining sequence

Once the bentonite has been removed from a pit it is either:

(1) Mined and hauled directly to the mill, or
(2) Ripped in place using a dozer or tractor equipped with a deep chisel to promote drying then loaded onto haul trucks for delivery to the mill, or
(3) Stockpiled in the field for drying prior to being loaded and hauled to the mill.

BPM uses explosives to blast and loosen deeper overburden that cannot be ripped by dozers. Blasting areas are located throughout the A-7 mining area. Blasting would take place between sunrise to sunset, generally in the afternoon, and can occur any day of the seven-day week. Signs that state "Blasting Area" are posted at all public entrances that provide access to a blasting area. Areas in which loaded holes are awaiting firing are guarded against unauthorized entry. Signs are posted at all public entrances to the permit area from public roads or highways stating "*Warning! Explosives in Use*". An explanation of the use of sirens as a blast warning is provided. All personnel in adjacent areas at risk to injury from fly rock are removed before the blast is initiated. All explosive agents are stored in one of two approved locations on BPM-patented land within the mine perimeter. Explosive powder (ANFO) is stored in a silo away from the locked magazines containing blasting caps. A siren is used for warning of an imminent blast, which is audible within a range of one-half mile from the point of the blast. All persons within the area are notified of the meaning of the siren.

The A-7 Plan of Operations does not propose to construct any Out-of-Pit Spoil (OOPs) piles on federal lands although two such piles are planned, one on patented land and one on state land. The graded piles would be blended into the surrounding reclamation. BPM would ensure the slope gradient is equal to or less than maximum valley slope.

BPM would use existing haul and access roads while mining under the A-7 Plan of Operations. BPM would disturb approximately 0.3 acres in the G' Claims area for haul road construction. All other haul road disturbance proposed under this Plan would take place on private land. BPM utilizes three primary roadway erosion control structures including culverts, a graveled road base and ditch turnouts, to promote adequate drainage. Indications of accelerated erosion or head-cutting will necessitate installation of rip rap to slow water flows and reduce the sediment loading downstream. More detailed information on proposed haul road disturbances and design is provided in Appendices A and B. All haul roads and access roads would be constructed and maintained in accordance to the performance standards in the BLM Manual 9113, Wyoming BLM Manual 9113 Supplement, BLM Manual Handbook H-9113-1, and BLM Manual 9112.

BPM would utilize contractors to conduct the mining and reclamation operations. The BPM mining supervisor would work with the contractor's field supervisors to ensure that mining is being conducted in a lawful and environmentally responsible manner. He also would supervise and direct the reclamation of pits.

C. Reclamation Plan

Reclamation of long term disturbance would take place within two years of mining a pit/pit series. After the bentonite is removed from a pit, reclamation typically consists of five steps:

(1) Backfilling the pit with overburden,
(2) Recontouring the backfilled surface,
(3) Spreading subsoil and topsoil over the recontoured overburden,
(4) Preparing the topsoil for seeding, and
(5) Applying a BLM-approved seed mix to the reclaimed area.

Slope and drainage restoration are also achieved during this process. Reclaimed slopes must blend with surrounding native and reclaimed lands as much as possible after mining in order to support post-mining land uses.

Under the A-7 Plan of Operations, no jurisdictional wetlands would be disturbed, and no permanent impoundments would be constructed on public lands. Channels would be reconstructed with similar sinuosity and stream gradient as the original channel. Erosion-resistant material such as large rock and boulders would be placed in the channel, on stream banks, or in areas of changing gradients. Velocity and flow control structures such as rip rap, straw bales or waddles, and sediment bars may be constructed within select portions of the drainage to reduce erosion. BPM may also utilize rock as a reclamation component. Rock can assist reclamation by creating micro-topography that may ultimately establish wind breaks, reduce erosion potential or create conditions that are more favorable to some shrub species. Surface rock may also be stacked to create wildlife habitat.

Sediment control during reclamation efforts would be accomplished using a combination of Best Management Practices (BMP's). Following final contouring and topsoiling, the area is ripped along contour to reduce compaction and create furrows to reduce runoff. BPM may use weed-free mulch to reduce runoff and increase moisture retention. Straw bale check dams would be placed within post-mine drainages to dissipate energy and filter sediment. Straw bales used on federal lands must be certified weed-free. If erosional features such as head cuts develop within a reclaimed channel BPM would implement mitigation measures such as: (1) armoring a channel reach with rock, (2) installing rock check dams, or (3) constructing drop structure(s) using rock or gabion baskets keyed into the channel bed and banks.

After mining and reclamation is completed, haul roads would be restored to pre-mine conditions to include removal of fill and culverts, reconstruction and restoration of channels, ripping and reseeding. If a road was present before mining operations and upgraded for mining purposes, the road would be returned to its original state.

Reclamation of an area would begin within two years and be completed within four years of the disturbance except where field drying of clay is taking place, in which case reclamation would begin within three years and be completed within five years. If delays to the committed schedule are anticipated, and dependent on the nature and extent of the delay, BPM would work with the WDEQ/LQD and BLM to resolve the issue.

BPM has proposed two long-term seed mixes provided in Table 3 below, which contain a mix of primarily native species. BPM has also included Russian Wild Rye, a non-native species, which has been approved by BLM in the past. BPM has also prepared a temporary use seed mix composed of grasses for stabilizing topsoil stockpiles. All permanent seeding would occur from October to November of each year or as long as the topsoil remains unfrozen. BPM would seed subsoil and topsoil stockpiles with Seed Mix No. 1 described below if the stockpiles would not be respread within 6 months.

BPM would use certified weed-free seed (per BLM policy IM-2006-073) and standard agricultural practices to minimize introduction of noxious weeds. BPM would consult with appropriate federal (BLM), county, and state agencies when other weed control methods such as spraying, are appropriate to control localized weed infestations on stockpiles or revegetated lands. BPM would continue these practices until the reclaimed lands are fully released from the reclamation performance bond.

BPM would employ some combination of grazing deferral, controlled grazing and/or fencing based upon agreement with respective surface owners (and/or public land livestock grazing permittees/lessees) to protect reclaimed areas from grazing. Fences would be removed after bond release unless the surface owner requests they remain and agrees to maintenance in writing.

BPM would prioritize the reestablishment of sagebrush habitat as a part of post-mine reclamation. BPM would commit to selective seeding the "Shrub (Sagebrush) Mix No. 2" on one acre per every 20 acres of disturbed land that was identified, pre-mine, as Mixed Desert Shrub (MDS; which equates to approximately 9.5 acres total). To maximize the potential for success, seeding areas with a reduced exposure to wind and with the potential to trap moisture would be selected.

In addition to sagebrush seed, the Shrub Mix consists of select forbs, shrubs, and grasses that would be less likely to out-compete the sagebrush. The presence of non-sagebrush species in the Shrub Mix not only enhances the habitat value of the mix, but also provides weed and erosion control in the form of ground cover.

Specific to re-establishment of sagebrush, BPM may at some point choose to experiment with other known full-shrub sagebrush species that could be accepted as either a substitute, or an addition to sagebrush. Examples of non-Big Sagebrush species that could be added to the *sagebrush mix* include:

(1) **Other full shrubs** (four-wing saltbush and spiny hopsage);
(2) **Sub-shrubs** (shadscale, winterfat, fringed sage, and dragon sagewort);
(3) **Grasses** (bluebunch wheatgrass, bottlebrush squirreltail, Indian ricegrass, prairie sand reed, Sandberg bluegrass, and basin wildrye); and
(4) **Forbs** (sweet vetch, globemallow, bee plant, evening primrose, basin daisy, and phlox).

Table 3. BPM A-7 Plan of Operations Reclamation Seed Mixes

Preferred Seed Mix No. 1 – Slopes and Mesa Soil Mix

Grasses	Pure Live Seed/pounds/acre
Indian Ricegrass (Rimrock variety)	1.0
Bottlebrush Squirreltail (native)	0.5
Bluebunch Wheatgrass Secar	1.0
Sandberg Bluegrass (native)	0.5
Alkali Sacaton (native)	0.5
Canada Wildrye (native)	1.5
Russian Wildrye--Bozoisky select	*1.0* (***See note above***)
Thickspike Wheatgrass (native)	1.5
Forbs	
Rocky Mountain Bee Plant (native)	0.5
Lewis Blue Flax (native)	0.5
Annual Wild Sunflower (native)	0.5
Shrubs	
Shadscale (native)	1.0
Gardner's saltbush (native)	3.0
Rubber Rabbitbrush (native)	1.0
Basin Big Sagebrush (native)	0.5
Four-wing saltbush (native)	2.0
Wyoming Big Sagebrush (native)	0.5
TOTAL	**17.0 LBS. PLS/acre**

Shrub Seed Mix No. 2

Grasses	Pure Live Seed/pounds/acre
Bluebunch Wheatgrass	2.0
Russian Wildrye	1.0
Bottlebrush Squirreltail	2.0
Sandberg Bluegrass	0.5
Forbs	
Rocky Mountain Bee Plant	0.5
Lewis Blue Flax	0.5
Western Yarrow	0.5
Shrubs	
Shadscale	2.0
Four-Wing Saltbrush	2.0
Winterfat	1.0
Big Sagebrush	1.0
Black Sagebrush	0.5
Fringed Sagebrush	0.5
TOTAL	**14.0 LBS PLS/acre**

Temporary Seed Mix No. 3

Grasses	Pure Live Seed/pounds/acre
Indian Ricegrass	1.0
Russian Wildrye	1.5
Bottlebrush Squirreltail	1.0
Sandberg Bluegrass	0.5
TOTAL	**4.0 LBS PLS/acre**

Methods for the evaluation of reclamation success (generally): Reclamation success is based upon restoring landscapes to the approximate original (pre-mine) contour and vegetative community in a stable, non-erosive manner and restore the post-mine land uses of grazing and wildlife habitat. BPM acknowledges bond release may only be approved when reclamation demonstrates that vegetation cover is equal to or greater than a similar native parcel, and be as hydraulically stable as pre-mine conditions. Bond release procedure to determine revegetation success would utilize the "Extended Reference Area" for comparison analysis. Vegetation transects on adjacent undisturbed lands for each affected vegetation map unit will be sampled for perennial species cover and species diversity. A minimum of 20 transects and a maximum of 50 would be sampled for each affected plant community map unit.

D. Monitoring

Monitoring of mining activities and impacts would take place throughout the A-7 area. BPM would visit and document mining activities throughout the life of the mine. Monitoring would assess the impacts of mining on surface water runoff, mine area drainage and berm stability, haul road stability, high wall stability, to establish the extent of any spills that may occur and any other undue or unnecessary degradation.

Monitoring would be done during times of non-operation or down time, when due to weather, mining or market conditions, pit areas are not actively being mined but remain open. Occupation of the high wall by raptors, incidence of vandalism, failure of roads, berms or other mining features and the general stability of the pit area and mine site would be noted. Photos may be taken on these visits as well. This includes monitoring of mine hydrology and wildlife activity. Instances of wildlife mortality will be noted during normal operations and reported to the Wyoming Game and Fish when appropriate.

Noise levels of field operations are monitored during regular inspections by the Wyoming State Mine Inspector and Federal Mine Inspectors. BMP will operate in compliance with MSHA noise standards.

Revegetation monitoring is conducted on an on-going basis by company personnel during normal field operations. These conditions are also reviewed during annual and biennial field inspections by WY-LQD and U.S.BLM personnel and reported in BPM's annual report.

Noxious weeds would also be monitored throughout the mining operations in the A-7 areas. If any noxious weeds found on the Wyoming State list, including Russian knapweed, white-top, or Canada thistle, are observed, the BLM would be contacted. Before any herbicides are used the BLM would also be contacted for approval. Special attention would be given to road corridors and any other place where topsoil has been disturbed.

Monitoring of field operations and contact with contractor's field supervisors would occur on an almost daily basis. BPM monitors all its reclaimed lands post closure for off-site sedimentation, erosion and seeding failures. Off-site sedimentation would be controlled by installation of straw bale or fabric check dams into affected drainages. Unacceptable erosion would be repaired at the first available opportunity. Past repair by BPM has mostly been accomplished by reconstructing the drainage and lining it with erosion control fabric, rock, or installation of rock gabions. Seeding would be monitored on a regular basis. If BPM finds vegetation establishment inadequate after three to five growing seasons, BPM would determine the reason for failure and mitigate the problem.

Migratory bird and mountain plover nest searches would be conducted prior to any initial surface disturbing activities between the dates April 15 to July 15. Between February 1 and July 31, BPM would monitor existing nests as well as the area around the disturbance for nesting raptors on highwalls, cliffs, and trees.

The BLM-CYFO would monitor the mine and reclamation areas at least twice per year to ensure that mining and reclamation are being completed according to the A-7 Plan of operations and in accordance with federal regulations.

E. Interim Management Plan

In the event BPM would temporarily close a pit or pit series, interim management procedures to stabilize the site would be implemented. Earthen berms would be constructed around the pit phase wherever a highwall occurs. Berms would also be installed at the tops of any ramps into a pit to prevent entrance. Temporary water diversions would be made around the pit to prevent water from entering the pit. Bentonite and spoil material stockpiles would be bermed to prevent off-site sedimentation. Drainages that have the potential to receive deleterious material if the constructed berms were to fail would have check dams installed, which would serve as a precautionary backup measure.

All equipment and supplies would be kept within the disturbance area. Any fuel storage tanks would either have a perimeter berm or would be placed within an excavated containment pit to control any potential spills. Finally, the pit area would be monitored on a regular basis to determine if problems are occurring that need to be addressed. All Storm Water Pollution Prevention and Control plans would be implemented and the areas in interim management would be regularly monitored.

2.2. Alternative II – No Action

The No Action Alternative serves as the baseline for comparison of impacts with the Proposed Action. Under the No Action Alternative there would be no bentonite mining approved in the area encompassed by the proposed A-7 Plan of Operations.

3.0 AFFECTED ENVIRONMENT

Introduction

This chapter presents the potentially affected existing environment (i.e., the physical, biological, social, and economic values and resources) of the A-7 Plan of Operations area as identified during scoping and/or the Interdisciplinary Team processes. This chapter provides the baseline for comparison of impacts or environmental consequences described in Chapter 4. Resource issues or concerns which may be affected by the proposed action are presented in Table 4.

Table 4. Affected Environment, Resource Issues and/or Concerns

Resource, Issue, and/or Concern
Air Quality
Cultural Resources and Native American Religious Concerns
Water (Surface and Ground) and Floodplains
Wetlands, Riparian, and Aquatic Resources
Geology and Minerals
Paleontological Resources
Soils
Vegetation
Invasive, Non-native Plant Species
Wildlife, Migratory Birds, and Raptors
Threatened & Endangered Species and BLM Sensitive Species
Livestock Grazing and Range Management
Socioeconomics
Recreation and Visual Resource Management (VRM)

3.1 Air Quality

Air pollutants present in the A-7 Plan area include particulate matter (PM) such as dust and emissions, such as volatile organic compounds (ground-level ozone), methane and other gases generated from heavy equipment, haul and water trucks, other vehicular traffic, and oil and gas fields. Pollutants are also emitted into the air from the nearby towns of Byron, Lovell, Cowley and Deaver, and from vehicles on roads and highways. Contaminants which are present in trace amounts include hydrogen sulfide (H_2S), sulfur dioxide (SO_2), nitrogen oxide (NO_x), carbon dioxide (CO_2), and vaporous hydrocarbons. These pollutants are further discussed below.

The primary air-borne pollutant in the area is particulate matter in the form of fugitive dust (uncontrolled wind-carried particulates) generated from natural and human sources. Particulate matter includes dust, soot and other tiny bits of solid materials that are released into and move around in the air. Particulates are produced by many sources including burning of gasoline and diesel fuels, incineration of garbage, mixing and application of fertilizers and pesticides, road construction, industrial processes such as steel making, mining operations, oil and gas fields, agricultural and forest burning, and operation of fireplaces and woodstoves.

Emission levels in northwest Wyoming are much lower than levels in highly developed and industrialized areas. Total suspended particulate matter (TSP) is the only contaminant for which long-term data are available (BLM, 2015). The long-term mean for TSP at Lovell is 32 micrograms per cubic meter. The 24-hour Wyoming Ambient Air Quality Standard (WAAQS) for particulate matter <10 microns in diameter (PM_{10}) is 150 (g/m3), and the 24-hour WAAQS standard for particulate matter <2.5 microns in diameter ($PM_{2.5}$) is 65 (g/m3).

No site-specific air quality data are available for the A-7 Plan of Operations area, however, air quality in the area is generally considered to be good and in compliance with state and national ambient air quality standards. The closest air quality monitoring station to the A-7 Plan area is a Wyoming Air Resource Monitoring System (WARMS) station located in Basin, Wyoming. This station monitors air quality for ozone, $PM_{2.5,}$ and ammonia ($NH_{4;}$ see chart below), as well as meteorological parameters such as wind speed, wind direction, air temperature and humidity.

WARMS is an air quality monitoring network maintained by the BLM Wyoming State Office (BLM-WYSO). (Sources: BLM WARMS networking site at http://www.blmwarms.net/monitoring-sites/basin-station.html, http://www.blmwarms.net/index.html).

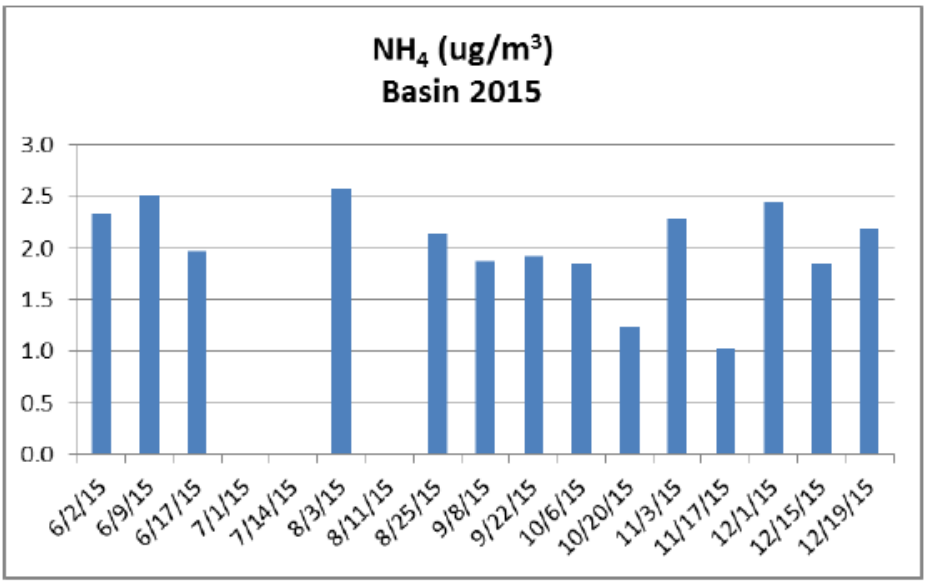


Figure 4-1. Basin AMON Data, Bi-Weekly Average NH_4 Concentrations

The chart above indicates values of ammonia in the Basin area range between 1.0 and over 2.5 micrograms/cubic meter (ug/m^3). The 10 highest daily maximums for ozone at the Basin WARMS station are 57-61 parts per billion ozone; the ten highest 24-hour averages for $PM_{2.5}$ are 10-22 ug/m^3. Multiple air quality parameters have also been measured from setting and collecting filter-packs which capture air pollutants such as oxides of sulfur and nitrogen, and common elements such as calcium, chloride, magnesium, sodium and potassium.

Other contaminants that may be present in trace to small amounts include hydrogen sulfide, sulfur dioxide, nitrogen oxide, carbon dioxide, and vaporous hydrocarbons. Visibility in the region is typically very good (greater than 70 miles) and fine particulates are generally considered to be the main source of visibility degradation. Additional detailed information on climate and air quality in the A-7 Plan of Operations area is found in Appendices A and B.

3.2 Cultural Resources and Native American Religious Concerns

Six (6) Class III Cultural Resource inventories were conducted, which encompass the proposed Plan of Operations amendment, all by High Country Archaeology, following the Wyoming State Historic Preservation Office (WYSHPO) Format, Guidelines, and Standards for Class II and III Reports (see Table 5). The various inventories inspected two thousand eight hundred ninety-one acres (2,891), and encountered fourteen (14) sites. Site types vary from historic era debris scatters to prehistoric aged lithic scatters, FCR scatters, and open camps. Eligibilities for the cultural resources include two (2) sites Eligible for the National Register of Historic Places (NRHP), three (3) sites Not Eligible for the NRHP, and nine (9) sites Unevaluated for NRHP eligibility.

Table 5. Class III Cultural Resource Inventories – Amendment 7 Plan of Operations

Project Name:	Arch. Contractor:	ID Number:	Acres:	Sites:
Amend. 6 (Add-on & Haul Rd)	High Country	HJ2007-06	237	1
Amend. 6 (Black Gulch A59-61)	High Country	HJ2008-38	60	0
Amend. 6 (Add-on Expansion)	High Country	HJ2010-02	432	2
Amend. 6 (2012 Update)	High Country	HJ2014-20	360	2
Amendment 7 (Phase I)	High Country	HJ2014-21	1189	4
Amendment 7 (Phase II)	High Country	HJ2015-01	613	5
TOTALS			**2891**	**14**

The area under consideration contains no known areas or locations of traditional religious or cultural significance to Native Americans. If such areas are subsequently identified or become known through the Native American notification or consultation process, they would be considered during the implementation phase. The BLM would take no action that would adversely affect these areas or locations without Tribal consultation.

3.3 Water Quality (Ground and Surface) and Floodplains

Groundwater: The quality of groundwater varies between aquifers. The A-7 Plan of Operations is not anticipated to encounter any groundwater during mining operations on federal lands. BPM has not gathered or provided any data on groundwater quality with the Plan. BPM operates shallow surface mines that do not penetrate deeper water-bearing zones. Although aquifers located below the A-7 area produce large amounts of high quality water to wells, they are all much deeper than the deepest mining zones.

Surface Water: Flow events in ephemeral drainages of the area usually occur several times per year. Channel substrate are typically composed of gravel, sand, and silt. BPM did not collect or provide data on surface water quality or suspended sediment for any of the watersheds affected by the proposed mining. Suspended sediment naturally discharges from all watersheds within the permit area. The total amount of sediment being discharged varies from storm to storm and year to year. Constituents in natural ephemeral streams of the area are composed of natural salts dissolved by rain and snowmelt water. However, in proportion to suspended sediment, the volume of dissolved components flowing downstream is relatively minor. No alluvial floodplains are proposed to be affected by the A-7 Plan of Operations.

Hydrology: Mining would take place in sixteen (16) watersheds under the A-7 Plan of Operations. The watersheds have well defined stream channels and watershed boundaries, however, the channels may not be well defined in the disturbance area. Watersheds within the A-7 area support sparse vegetation and contain topography shaped by fluvial erosion. The watersheds range in size from 4,653 acres (Black Gulch area), up to 162 acres (Carr area).

The highest elevation in the watershed is 7,650 feet. The average slope of the watersheds is 4.9%. The predominant aspect of the A1 Claims, Carr and Cowley State Section watersheds is to the west. The predominant aspect of the G Claims area is southeast and the predominant aspect of the Black Gulch Area is southwest.

Watershed CR4 is perennial due to a flowing irrigation well developed by Lee Carr on his property, however all other streams associated with the mine site are ephemeral and eventually discharge into the Big Horn River downstream of the mine disturbance area.

Most of the ephemeral streams are well-defined single channels with steep banks. Rock outcrops and ledges occur in some of the channels within proposed A-7 mine sites, however, most channels have gradually-sloping banks. Channel beds contain a variety of material such as boulders, cobble, sand and silt; vegetation such as big sagebrush, greasewood and bunchgrasses are present on the banks. Stream channels were surveyed where BPM plans to mine, or plans to cross with access/haul roads. Channels not to be mined, small channels, and minor swales were not surveyed.

3.4 Wetlands, Riparian and Aquatic Resources

BPM staff and consultants completed wetland assessments for entire A-7 Plan area in 2010 in order to investigate, delineate, and characterize wetlands and potential wetlands within the A-7 area. Wetlands and riparian areas were found on some of the private (Carr) lands during the surveys, but none of these areas would be disturbed by mining or hauling activities proposed. Within the G' Claims Area, the relevant National Wetlands Inventory (NWI) maps (Cottonwood Canyon USGS Quadrangle Map) indicated one potential wetland classified as a 0.08-acre Palustrine site within the proposed A-7 boundary in the NW¼SE¼ Section 25, T. 56 N., R. 94 W. A subsequent field investigation was conducted to verify this and search for other potential wetlands. The potential site was found not to qualify as a wetland based on the Wetland Determination Form for the Arid West Region.

3.5 Geology, Overburden and Mineral Resources

GEOLOGY: The A-7 area is located in the northeastern Bighorn Basin, a large elliptical basin bounded on the north by the Pryor Mountains on the east by the Bighorn Mountains, on the south by the Owl Creek and Bridger Mountains, and on the west by the Absaroka Mountains. The surrounding mountains and associated folds in the Bighorn Basin formed during the Laramide Orogeny, a compressional mountain-building event that took place from Late Cretaceous time to middle Eocene time approximately 80 to 40 million years ago (mya).

The Absaroka Mountains are a result of volcanic activity that began about 50 mya. The center of the basin is filled with flat-lying Eocene sediments (55-34 mya), with progressively more complex folding and faulting in Mesozoic (250-65 mya) and Paleozoic (542-251 mya) strata as the flanks of the mountains are approached.

In the Bighorn Basin, commercial bentonite beds currently are limited to middle-lower Cretaceous strata, identified as the Thermopolis Shale, Mowry Shale, Frontier Formation and Cody Shale. These strata contain bentonite beds of varying thicknesses interbedded with gray, marine shales and claystones which were deposited in the Cretaceous Interior Seaway around 100 million years ago.

BPM intends to mine multiple bentonite beds as part of the A-7 Plan of Operations. BPM proposes to mine beds in all four formations listed above including the 9th and 10th beds of the Mowry Shale, the 2nd and 3rd beds of the Thermopolis Shale, the F-2 bed of the Frontier Formation, and the Windy Bed of the Cody Shale. Mining depths are variable as mining progresses from outcrop to depths of up to sixty feet.

OVERBURDEN: Topography of the A-7 area varies by location. The Black Gulch Area is generally rolling with a gradient of approximately 2-30 percent dipping to the south southwest. The G' Claims area is rolling topography with a gradient of approximately 5-10 percent.

The A-1 Claim area is a gentle consistent gradient of approximately 1-3 percent to the west. The most northerly of the areas, the Carr area rolling rangeland with a gradient of approximately 1-5% draining in a southern direction, or flat to 10 percent. The Cowley School Section area has two slope characteristics. The characteristic of the north western part is mostly reclaimed land that has a gradient of approximately 2-5 percent. The characteristic of the south easterly section to be mined is generally rolling with a gradient of approximately 0 to 5 percent.

Overburden associated with each bed was sampled by BPM and Intermountain Laboratories in five-foot increments to the contact with the top of the bentonite. Samples of overburden in the Modification area were tested for several parameters including pH, percent saturation, conductivity, calcium, magnesium, sodium, sodium absorption ratio (SAR), and acid-base potential (ABP). Overburden sampling characterizes soil and rock units below the surface to determine if their exposure to potential ground or surface water would adversely affect the environment and if the overburden would be suitable plant growth.

Overburden considered detrimental to ground or surface water and plants would be managed to minimize its impact to the environment and potential rooting zones. This would include burying unsuitable material above groundwater zones and below the surface to prevent any wicking or capillary draw. Where BPM intends to mine in the Upper Thermopolis Shale (the 1st, 2nd, and 3rd beds), low pH, high SAR, and low ABP can be expected. Where BPM intends to mine in the Mowry Shale (the 9th and 10th bed) high SAR can be expected. Where BPM intends to mine in the Frontier Formation, the F-2 bed is expected to present low pH, high SAR, and low ABP. Where BPM intends to mine the Cody Shale, high SAR is expected in the Windy Bed. All unsuitable overburden with low ABP and high SAR would be buried and capped. All other unsuitable overburden would be buried and capped with top soil.

MINERAL RESOURCES: Bentonite is the only locatable mineral found in this area. No commercially-valuable mineral materials such as sand, gravel, or flagstone are located in the proposed A-7 Plan area. No oil and gas leases are currently located within this area. No solid leasable minerals such as coal or trona occur in the area.

3.6 Paleontological Resources

The Potential Fossil Yield Classification (PFYC) for the A-7 plan area is rated as a Class 3 meaning there is a moderate potential for vertebrate and scientifically significant fossil resources in those formations being mined, which include the Thermopolis and Mowry shales, the Frontier Formation and the Cody Shale.

These formations represent ancient marine and terrestrial sedimentation in and adjacent to a Cretaceous-age interior seaway that covered most of Wyoming at that time. Vertebrate species occupied this seaway, notably marine and terrestrial reptiles and various types of fish. Multiple types of invertebrates also occupied these ancient environments. The Mowry Shale is known for its abundance of fossil fish scales in certain units. The Muddy Sandstone Member of the Thermopolis Shale also yields occasional vertebrate fossils such as teeth and chunks or chips of fossil bone. The Muddy Sandstone Member of the Thermopolis Shale is located stratigraphically below any of the bentonite units proposed for mining.

3.7 Soils

Soil resource inventories were conducted for BPM by James Nyenhuis, Certified Professional Soil Scientist/Soil Classifier (ARCPACS 2753) during the 2008 and 2009 field seasons, and by Shell Valley Consulting. Soil series, map unit descriptions, and soil interpretation records for series and families in the A-7 Plan area were obtained from the Natural Resources Conservation Service (NRCS) to assist in soil identification, mapping, and interpretation. Soils were tested for pH, electrical conductivity (EC), saturation percent, calcium, magnesium, sodium, the sodium adsorption ration (SAR), and texture. BPMs soil survey data is summarized in Appendix E.

This EA provides information on the areas where public land is proposed for disturbance namely the Black Gulch, G claims and A-1 claim areas. The Carr and Cowley School Section areas do not involve public land, therefore, soils located in these areas are not discussed in this EA. The portions of the A-7 Plan that involve federal land are dominated by shallow clay soils derived from shale and colluvium. Most of the soils contain a suite of neutral salts, such as the sulfates, carbonates, and chlorides of sodium and calcium. In addition, some have a considerable amount of exchangeable sodium and are classified as saline-sodic soils. Many of the soils in the proposed mining area contain a thin surface layer that is marginally suitable as topsoil.

Subsoil is generally unsuitable due to high exchangeable sodium (high SAR) and some have high amounts of salt which are more soluble than gypsum (high EC). Most of the unsuitable subsoils with a high SAR are saline-sodic, which means they contain appreciable quantities of neutral salts and enough sodium ions to affect most plants. Excess sodium indirectly affects plant growth through deterioration of soil structure. This breakdown of soil structure could result in restricted water movement, aeration, root elongation and seeding emergence and development. It also affects the ability of many plant species to extract nutrients. Soils with higher SAR tend to support saline-tolerant vegetation, such as that found in Gardner's saltbush communities.

All lands within the A-7 Plan area were mapped at the detailed Order 1-2 level of intensity. The soils mapping was later recorded on the most recent, rectified, orthophoto maps of 2006 obtained for the project by Shell Valley Consulting. A-7 soils were analyzed for pH, electrical conductivity (EC), calcium, magnesium, and sodium and the subsequent calculation of Sodium Adsorption Ratio (SAR), organic matter percent (Walkley-Black method), saturation percent, and texture by hydrometer (percent sand, silt, and clay). In addition to these parameters, the CSU samples were also analyzed for parts-per-million (ppm) of macronutrients nitrate-nitrogen (NO_3-N), phosphorus (P), and potassium (K), and micronutrients zinc (Zn), iron (Fe), manganese (Mn), and copper (Cu). Lime estimate was also included.

An evaluation of soil suitability and recommendation of salvage depths (both a topsoil and subsoil salvage recommendation) was completed for all component soils of survey map units. The soil profile descriptions for all sampled soils include added information for each soil horizon taken from the soils laboratory data. Soil reaction (pH), electrical conductivity (EC), and sodicity (Sodium Adsorption Ratio, SAR) values are added to the profile description so that the reader can see whether a particular soil or individual horizons within a soil have low or high values concerning pH, EC, and SAR.

The BPM A-7 Area in Big Horn County is within a "mesic" soil temperature regime (mean annual air temperature about 48-52°F) and a "typic-aridic" soil moisture regime (mean annual precipitation about 5 to 9 inches). The average frost-free period is about 110 to 140 days.

The permit area is characterized primarily by the presence of three shallow soils (Persayo, lithic, very gravelly loam – Map Units 10, 11, and 13; Persayo Variant, lithic, very gravelly loam – Map Unit 15; and Chipeta gravelly clay – Map Units 11 and 14); one shallow to moderately deep, saline/alkaline soil (Mudray shaly loam – Map Unit 8); one moderately deep soil (Saddle gravelly loam – Map Unit 9); and two moderately deep to deep soils (Apron Variant very gravelly sandy clay loam – Map Unit 12, and Larim Variant very gravelly loam – Map Unit 17).

There are also several bedrock types mapped in the project area including Badlands (BL); Shale - Bentonite Outcrops (SBO); and Badlands – Shale – Bentonite Outcrops complex (BL-SHO). Pre-Law Disturbed Land (PL), Disturbed Land (DL), and Intermittent Pond (IP) were also delineated in the Project Area. Several of the soils mapped on the project area have names followed by "Variant" or "lithic".

3.8 Vegetation

Vegetation community mapping for the A-7 Plan areas was conducted by BPM between 2006 and 2011 using the line transect sample method. The following vegetation units were identified and mapped in the A-7 Plan areas: Salt Desert Shrub (SDS), Mixed Desert Shrub (MDS), Outcrop Complex/Barren, and Previously Disturbed Lands (Figure 4). Inventories included delineation of vegetation community map units, photographic records representing vegetation map units within the study area, and transect data describing individual plant species and life-form cover, total vegetation cover, total cover (litter, rock and vegetation) and shrub density. The majority of land within the proposed mining area lies within seven ecological site descriptions, all located in the 5-9-inch precipitation zone for the Bighorn Basin, as follows: Shallow Sandy, Shale, Saline Upland, Gravelly, Very Shallow, Badland, and Barren Rock Outcrop (USDA-NRCS, 2005). Acreages of each soil type proposed for new disturbance are provided in Table 6.

Black Gulch Area Vegetation types for the A-7 "Black Gulch Area" include the following two map units: (a) Salt Desert Shrub (SDS) and (b) Barren Outcrop (OC). Topography varies from dissected badland drainages and escarpments to relatively gentle upland hills and benches. Slopes range from 0 to 6 percent in the SDS map unit and over 60 percent in spots of the OC map unit. Aspects are primarily easterly. In the Salt Desert Shrub (SDS) unit, the dominant shrub and plant species overall is Gardner's saltbush (*Atriplex gardneri*). It includes a few barren outcrop shale/clay outcrop (OC) inclusions. Slopes range from zero to six percent. The Salt Desert Shrub map unit is defined as a rangeland cover type including a perennial grass (Sandberg bluegrass (*Poa secunda),* as well as pricklypear cactus (*Opuntia polyacantha*). The Barren Outcrop (OC) unit designates barren and nearly barren shale, clay, or bentonite outcrops that occur within the Black Gulch study area. Minor inclusions (<10 percent) of sparsely vegetated *Atriplex dioica* and *Suaeda nigra* populations occur but do not provide greater than 1 percent ground cover.

G' Claims Area Vegetation types for the A-7 "G' Claims Area" are delineated into the following three map units: (a) Mixed Desert Shrub (MDS), (b) Salt Desert Shrub (SDS) and (c) Barren Outcrop (OC). Topography varies from dissected badland drainages and escarpments to relatively gentle upland hills and benches. Slopes range from 0 to 12 percent in the MDS and SDS map units. Slopes in the OC map unit ranged from 0 to 50 percent. Aspects are primarily northwesterly for the MDS map unit, and southerly for the SDS map unit. Forty-three transects were ran within the MDS map unit; fifty transects were completed within the SDS map unit. No transects were ran in the barren OC map unit.

In the Mixed Desert Shrub (MDS) unit, vegetation is more productive and has more diversity than in the Salt Desert Shrub community. Perennial grasses found in this unit include needle and thread (*Hesperostipa comata*) and sand drop seed (*Sporobolus cryptandrus*). The prevalent succulent is pricklypear cactus (*Opuntia polyacantha*). Shrubs and subshrubs that dominate the unit include big sagebrush (*Artemisia tridentata*), broom snakeweed (*Gutierrezia sarothrae*), and Gardner's saltbush (*Atriplex gardneri*). The MDS map unit covers about 2/3 of the area occurring in the G' Claims Area. Topography is mainly upland rolling hills.

This map unit does border some barren outcrop shale/clay outcrops. Slopes vary from flat to 10 percent. Also, there is a pre-mine haul road that has affected this vegetation type that has been taken into consideration for the disturbed acreages calculated.

In the Salt Desert Shrub (SDS) unit, the dominant perennial grasses include sand drop seed (*Sporobolus cryptandrus*) and bottlebrush squirreltail (*Sitanion hystrix*). The dominant succulent is pricklypear cactus (*Opuntia polyacantha*). The dominant shrub and plant species overall is Gardner's and broom snakeweed (*Gutierrezia sarothrae*). This map unit occurs in the northeastern, approximately one third of this study area. It includes a few barren outcrop shale/clay outcrop (OC) inclusions. Slopes range from zero to twelve percent. The Barren Outcrop (OC) unit designates barren and nearly barren shale, clay, or bentonite outcrops that occur within the G' Claims study area. Minor inclusions (<10 percent) of sparsely vegetated *Atriplex dioica* and *Suaeda nigra* populations occur but do not provide greater than 1 percent ground cover. This map unit was not sampled because of sparse vegetation cover.

Claim A-1 Area The A-7 "Claim A1 Area" is delineated into one map unit composed of Mixed Desert Shrub (MDS). Topography for this twenty acre claim is relatively gentle upland hills. Slopes range from 0 to 15 percent in the MDS map unit. Aspects are primarily westerly. Due to this area being only one claim (20 acres), the LQD Lander Office agreed to accept the data as confirmed in a September phone conversation.

The perennial grass dominating this site is Sandberg's bluegrass (*Poa secunda*). The perennial forb is hoary tansyaster (*Machaeranthera canescens*). Shrubs and sub-shrubs that dominante the area include big sagebrush (*Artemisia tridentata*), Gardner's saltbush (*Atriplex gardneri*), and shadscale saltbush (*Atriplex confertifolia*). The Mixed Desert Shrub map unit occurs as the entire area besides the pre-existing roads. Topography is gentle upland rolling hills. Slopes vary from flat to 15 percent.

Table 6. Proposed Affected Acreages by Vegetation Map Unit and A-7 Areas

MAP UNIT	AMENDMENT 7 AREAS (in acres)					GRAND TOTALS
	Black Gulch	G' Claims	Claim A1	Carr Area	Cowley State Section	
SDS	12.65	18.29	-	103.32	62.87	**187.13**
MDS	-	73.94	15.06	54.37	46.77	**190.14**
OC	1.27	6.69	-	7.48	0.83	**16.27**
DL	-	0.88	2.47	-	3.87	**7.22**
Reclaimed	-	-	-	-	23.83	**23.83**
TOTAL	**13.92**	**99.80**	**17.53**	**165.17**	**138.17**	**434.59**

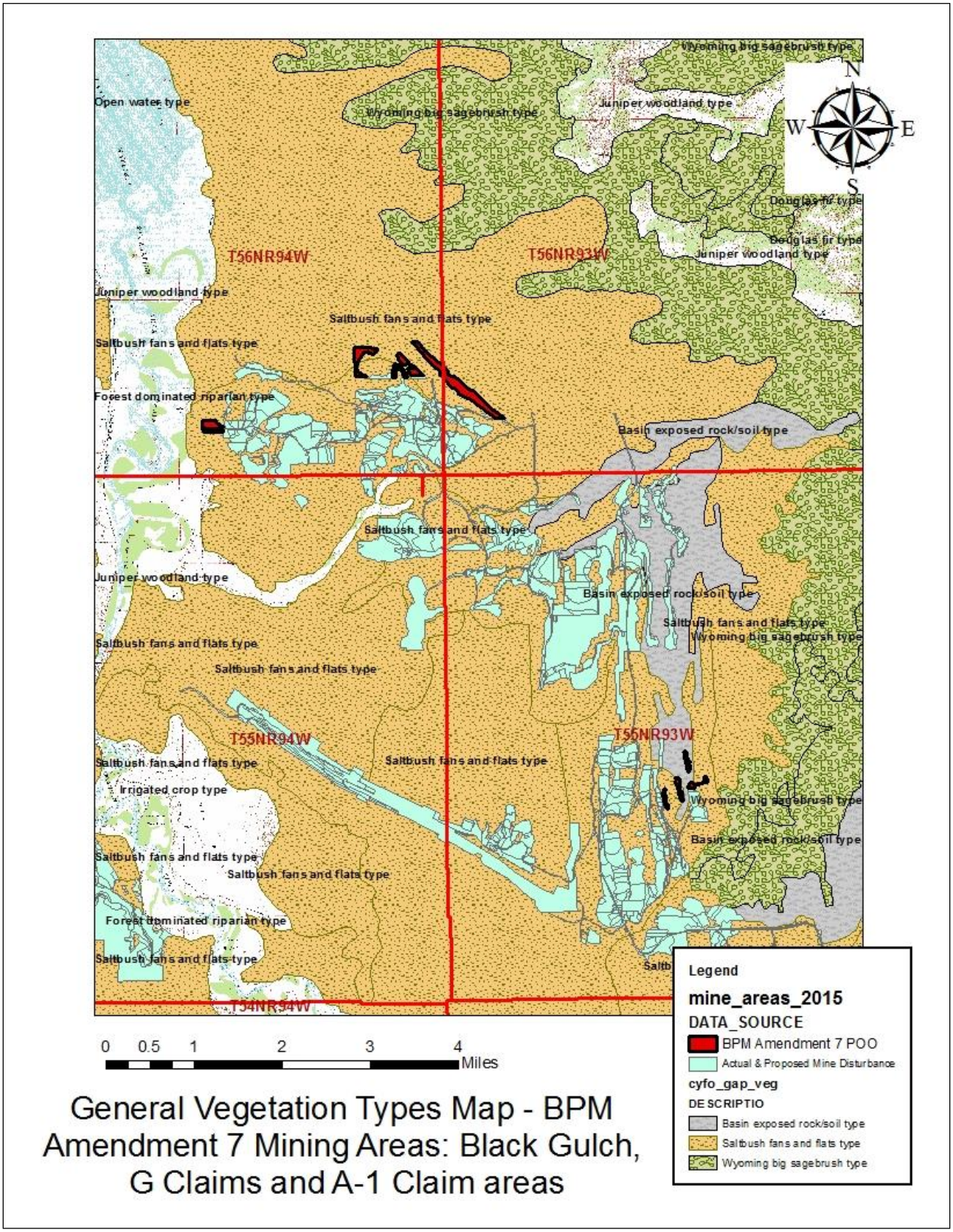


Figure 4. Map of General Vegetation Types – BPM A-7 Plan of Operations Areas

3.9 Invasive, Non-native Plant Species

Though there are invasive, non-native weed species present including cheatgrass and halogeton on previously disturbed areas such as haul roads and adjacent mined areas, native plants are still the dominant species in the proposed mining area. Weeds are most common in disturbed areas throughout the A-7 Plan area and BPM is required to treat these weeds annually to prevent them from spreading.

3.10 Wildlife, Migratory Birds, and Raptors

Ground wildlife and bird surveys were conducted in the A-7 area by Shell Valley Consulting between October 2002 and March 2012. Ground surveys were generally conducted in early morning. The wildlife and bird surveys followed an established route from east to west, or west to east. During April surveys the route was changed to include known sage grouse lek locations, whereas May/June surveys focused on locating mountain plover and raptor nesting sites. Wildlife survey data was collected on a wildlife observation form. Information gathered included the time and date of the observation, the wildlife species and the location of the observation. Weather measurements such as temperature, wind speed and direction, and the presence of snow cover were also noted on the form, as well as notes discussing the cloud cover and other information.

A variety of wildlife and bird species were observed within and surrounding the A-7 Plan area. BPM consulted with the Wyoming Game and Fish and the U.S. Fish and Wildlife Service. A summary of all wildlife observations noted within two miles of the A-7 Plan is provided in the Plan of Operations.

Big Game: Big game animals found within the A-7 Plan area include mule deer (*Odocoileus hemionus*), pronghorn antelope (*Antilocapra americana*) and elk (*Cervus canadensis*), each of which was observed during field observation surveys. Moose (*Alces alces*) may occasionally visit the area, but none were seen. Whitetail deer (*Odocoileus verginianus*) and Bighorn sheep (*Ovis canadensis*) are not likely to use this area. Pronghorn antelope and mule deer were frequently observed within the study areas of the Black Gulch, G' Claims, and Claim A1 in late winter, early spring and summer.

Migratory Birds of High Federal Interest (MBHFI): Many migratory bird species use the A-7 area including the following: sage sparrow *(Amphispiza belli),* sage thrasher (*Oreoscoptes montanus*), horned lark (*Eremophila alpestris*), vesper sparrow (*Pooecetes gramineus*), Brewer's sparrows (*Spizella breweri*), mountain plover (*Charadrius montanus),* and loggerhead shrike (*Lanius ludovicianus*). These birds mate, nest, and over-summer in the areas proposed to be mined under A-7. They also frequently return to the same area year after year. Sage sparrow and Brewer's sparrow are Level I MBHFI species and were observed in lands around the study area.

Mountain plover, recently proposed to be listed on the federal Threatened and Endangered Species List, are currently considered a BLM Sensitive Species and protected under the Migratory Bird Treaty Act (MBTA), 16 U.S.C. 703. Mountain plover, a USFWS special interest species, have been seen in and around the Black Gulch area of the A-7 Plan area. Mountain plover are recognized as a species of concern and approximately 30,000 acres of plover habitat have been mapped within the cumulative effects analysis area for this Plan. Plover have been observed around and within the Black Gulch Area. Pre-disturbance surveys will be done during nesting season in the area.

Lark bunting (*Calamospiza melanocorys*), loggerhead shrike (*Lanius ludovicianus*), lark sparrow (*Chondestes grammacus*) and merlin (*Falco columbarius*) are Level II MBHFI species that were observed in the study area. Western bluebird (*Sialia mexicana*), grasshopper sparrow (*Ammodramus savannarum*), and vesper sparrow (*Pooecetes gramineus*) are listed as Level II MBHFI species, and although not seen in the study area, are known to occur in the region.

Raptors documented within the A-7 observation area include the golden eagle (*Aquila chrysaetos*), red-tail hawk (*Buteo jamaicensis*), Rough-legged hawk (*Buteo lagopus*), and American kestrel (*Falco sparverius*). Ferruginous hawk (*Buteo regalis*), bald eagle (*Halianaeetus leucocephalus*), Swainson's hawk (*Buteo swainsoni*), and burrowing owl (*Athene cunicularia*) are listed as Level I MBHFI species and have been seen in the region. Several raptor nests are known near the A-7 Plan area but none are located directly within this area.

NESTS AND NESTING BIRDS: A Bald Eagle nest has been mapped within one mile of the mining proposed on the A-1 claim east of the Bighorn River (Figure 2). Monitoring of this nest will be conducted during the quarterly wildlife surveys if it can be located. No known golden eagle nests are present within a ½ mile of the A-7 areas. No other raptor nests were observed near the proposed A-7 mining areas. However, if others are found in the study area, the USFWS will be consulted to discuss mitigation.

SAGE GROUSE AND LEKS: Sage grouse (*Centrocercus urophasianus*) are recognized as a species of special interest and were observed on the survey route, but have not been observed within the A-7 area although the area is located in Sage Grouse General Habitat. The proposed A-7 mining is located within a General Habitat Management Area (GHMA) for sage grouse. Sage grouse using this area are likely connected to populations in Montana and to the southeast. The proposed A-7 Plan areas are situated in habitat that varies from marginal to more suitable general sage grouse habitat.

No sage grouse leks are located on any of the lands proposed for new mining under A-7. Six active sage grouse leks within seven miles of the A-7 area have been surveyed during the breeding season from 2003 until the present. Those six leks are: Upper Bear Creek, Lower Bear Creek, Block Butte, Bear Creek Ranch, Dry Bear 1, and Dry Bear 2. The Block Butte and Dry Bear #1 leks have shown activity during each of these monitoring visits with as many as 31 birds observed during the breeding season (Source: Amendment 7, Appendix D-9, Wildlife).

OTHER WILDLIFE: Other wildlife observed or noted from sign within the observation area for this amendment include bobcat (*Lynx rufus*), badger (*Taxidea taxus*), coyote (*Canis latrans*), fox (*Vulpes vulpes*), cottontail rabbit (*Lepus townsendi*), and white tailed jack rabbit (*Lepus townsendi*). One blacktail prairie dog (*Cynomys ludovicianus*) was observed in the SW¼ Section 21, T. 55 N., R. 93 W. and noted on the March 9, 2005 observation form.

In addition, there is a whitetail prairie dog (*Cynomys leucurus*) complex in Section 27 of the Carr property and surrounding properties. The proposed disturbance will remove less than five holes, of which no more than 3 prairie dogs have been observed. Common reptiles known to occur in the area include sagebrush lizard (*Sceloporus graciosus*), short horned lizard (*Phrynosoma douglassi*), and prairie rattlesnake (*Crotalus viridis*). Very few have been encountered during field surveys.

CONSULTATION: BPM consulted with the U.S. Fish and Wildlife Service (USFWS) in 2010 as well as the Wyoming Game and Fish Department (WGFD) in 2012. Agency responses indicated concern for the following: nesting raptor species, migratory birds, mountain plovers, sage-grouse, prairie dogs, and impacts to nearby drainages. A few of the non-BLM-Sensitive wildlife species using this area include mule deer, pronghorn antelope, coyote, jackrabbits, cottontail rabbits, Ord's kangaroo rats, olive-sided pocket mice, short horned lizards, sagebrush lizards, prairie rattlesnakes, plains spadefoot toads, golden eagles, red-tailed hawks, horned larks, and vesper sparrows. Songbirds migrate to the area to breed, nest and spend the summer.

The horned lark, corvids, and raptors are some of the few species that spend the full year in the region; however, they still migrate to different habitats and are still considered migratory. Ungulates typically move through the area, utilizing it, as well as other habitat in the region as corridors, places to find food, and places to rear young.

3.11 Threatened & Endangered Species and BLM Sensitive Species

THREATENED & ENDANGERED SPECIES: Site surveys have determined that no Threatened or Endangered plant or animal species (lynx, grey wolf, grizzly bear, black-footed ferret and Ute's Ladies Tresses) are located in the proposed A-7 Plan area. The USFWS noted in its response letter to BPM that two federally listed wildlife species may occur in the vicinity of the permit update area. These include the black-footed ferret (*Mustela nigripes* - endangered) and the bald eagle (threatened (now delisted)). The bald eagle winters in the region and migrates through this area. Bald eagles were not seen hunting, nesting or roosting within the permit boundary.

The Wyoming Game and Fish Department notified BPM/SVC of a bald eagle nest along the Bighorn River approximately one mile away from the Claim A1 area of A-7. It is outside of the suggested buffer zone of the USFWS, and no impacts are expected. Black-footed ferrets were not observed in any of the A-7 areas, and habitat associated with this species (large prairie dog colonies) was not observed in the survey area. The prairie dog complex in Section 27 of Lee Carr's private property and surrounding ground consists of three very small colonies and spread out over several miles. The complex is not considered to have large enough colonies to be suitable habitat for black-footed ferrets.

BLM SENSITIVE SPECIES: As mentioned above, several BLM Sensitive species use the general area. In addition to the bird species listed above, the area is used by Townsend's big-eared bats (*Corynorhinus townsendii*), spotted bats (*Euderma maculatum*), and white-tailed prairie dogs (*Cynomys leucurus*). Persistent sepal yellowcress (*Rorippa calycina*), a BLM Sensitive plant species, may also be present in and around seasonal wetlands, reservoirs, or stream channels in the area.

3.12 Livestock Grazing and Range Management

Both the A-1 Claim and G' Claim areas are situated within BLM grazing allotment #01025, the Mills Allotment. In this Allotment, approximately 117.33 of the 5575.5 acres (~2.1%) are proposed to be mined under the A-7 Plan of Operations. There are 173 animal unit months (AUMs) currently permitted for livestock grazing in this allotment, stocked at 32 acres/AUM. An AUM is defined as the amount of forage needed to sustain one cow and her calf, one horse, or five sheep or goats for a month. Generally, 600 to 800 pounds (dry weight) of forage is used per AUM. Approximately 3.7 AUMs would be temporarily lost due to disturbance of 117.33 acres in this allotment.

The Black Gulch Area is situated in the Crystal Creek Allotment #01023. Approximately 6.13 acres of the 18,850.5 acres (0.03%) within this allotment are planned to be mined under the A-7 Plan of Operations. There are 300 AUMs currently permitted for livestock grazing in this allotment stocked at 63 acres/AUM. Approximately 0.1 AUM would be temporarily lost due to disturbance of 6.13 acres in this allotment. A total of 3.8 AUMS would be temporarily lost over the life of the A-7 Plan on public lands.

3.13 Socioeconomics

The proposed operation is located in Big Horn County, Wyoming. The closest community is the town of Lovell. Lovell is located about 11 miles northwest of the proposed A-7 Plan area, and has a population of 2,423 people (2013 data). In 2010, the estimated population of Big Horn County was 11,696 people.

Communities in Big Horn County include Basin (the county seat), Burlington, Byron, Cowley, Deaver, Emblem, Frannie, Greybull, Hyattville, Shell, Lovell, Manderson, and Otto. Big Horn County covers 3,137 square miles and has a population density of 3.7 people per square mile. Between 1970 and 2010 the County's population grew by 14 percent. Between 2000 and 2011, its population increased by three percent. The area has a strong agricultural economy, which includes farming (corn, sugar beets, alfalfa, barley, beans, hay) and ranching (cattle, sheep, horses).

Data from the State of Wyoming Economic Analysis Division indicate that mining (including oil and gas) accounts for 10.1% of the jobs and 16.1% of the personal income in Big Horn County. In 2013, mining employment provided an average wage per job of $46,674; approximately 699 people were employed directly by the mining industry (including oil and gas) in the county (WEAD, 2015). BPM employs 10 or more people directly in the mine, and 67 people in the mill (Wyoming Mining Association, 2016). They also contract with various Big Horn County service companies to conduct mining activities within permitted areas. These service companies provide heavy equipment and labor to strip and salvage soil and overburden, expose, mine and haul the clay, and conduct reclamation and seeding.

The State of Wyoming Economic Analysis Division study also shows that farming (including ranching) accounts for 11.1% of the jobs and 8.9% of the personal income in Big Horn County. In 2013, farming employment provided an average wage per job of $25,737 and employed approximately 767 people (WEAD, 2015). Livestock grazing has been, and continues to be, a major resource-use activity on BLM-administered public lands in the Cody Field Office and around the proposed mining areas analyzed in this EA. Grazing has occurred in the proposed mining area for over 100 years.

This area is also used for recreational purposes, such as hunting, hiking, rock hounding, and off-highway vehicles, as well as for other values such as driving for scenic pleasure, finding solitude, and wildlife viewing. The Bighorn Basin has an active tourism industry from people visiting Yellowstone National Park and the Bighorn Canyon Recreation Area, among other attractions.

3.14 Recreation and Visual Resource Management (VRM)

RECREATION: Portions of the A-7 Plan proposed for mining on public lands have no specific recreation management prescriptions or designations although recreational use is recognized in the area. Recreational activities observed in the project area include driving for pleasure/OHV use, hunting, hiking, rock hounding, and other similar types of dispersed activities.
The proposed project is located on BLM-administered public lands that are not managed primarily for desired recreational settings, experiences, and beneficial outcomes; but rather to address resource concerns, public health and safety, and user conflicts. Recreation use surrounding the project area takes place with Crystal Creek Road providing the primary access route into the surrounding public lands. The complex landscape observed within the area (bounded by US Highway 14 to the north, Crystal Creek Road to the west, the Slope of the Bighorns to the east, and Greybull, Wyoming to the south) creates a recreational setting desirable for recreational visitors pursuing a variety of activities including hunting, hiking, horseback riding, sightseeing, driving for pleasure, off-road use (ATV/Truck), rock hounding, and wildlife viewing.

Recreational setting characteristics surrounding the project area are identified as middle country to rural. Bentonite mining activities have altered the setting characteristics from a middle country setting to more front country and rural setting. These characteristics are observed by the altering physical and social components within the area as mining activities continue, however, even with these activities present, recreational use is still observed.

VISUAL RESOURCE MANAGEMENT: The A-7 Plan of Operations area is located on BLM-administered public lands managed under VRM Class IV objectives which allow for major surface disturbing activities that can distract the casual observers' attention away from the natural surrounding elements. Recent visual resource inventories scored the scenic quality as "B", sensitivity levels as "low", and distance zone as foreground, which placed the scenic quality rating unit as an inventory class IV. The quality rating unit is complex containing long ridges to eroded colorful banded cliffs, influencing the scenic quality rating to a medium rating. Cultural modifications are present throughout the quality rating unit and are observed as dominantly ranching and mining activities, primarily bentonite. While the overall visual sensitivity for this area is low, the public values the area for many other uses including ranching, wildlife habitat, bentonite and other mineral recovery operations, and recreation.

4.0 ENVIRONMENTAL EFFECTS [Direct and Indirect Impacts]

4.1 Alternative I - Proposed Action

4.1.1 AIR QUALITY

The air quality of the surrounding area would be affected for the life of the A-7 mine due to implementation of the Proposed Action. Elevated amounts of dust could continue to be generated even after the proposed mine area was reclaimed until vegetation is reestablished. Soil and overburden stripping, and bentonite mining and hauling would result in an increase in the amount of particulate matter, fugitive dust, and fossil fuel combustion-related air pollution (soot, $C0_2$, CO, and O_3) entering the air in the local area. In reclaimed areas not fully revegetated dust would be kicked up by wind until enough vegetation was present to stabilize soils and particulates. Trucks using area haul roads would continue to increase the amount of dust in the air until these roads were reclaimed or were no longer used as haul roads. No mitigation has been proposed for release of combustion-related byproducts caused by operation of heavy equipment and haul trucks, which is necessary and due for running mining operations. The Air Quality Standard #6 (Air Quality) for Healthy Rangelands in Wyoming could fall below the threshold to meet the standard if the WDEQ determined that the air quality in the area was impaired. If air quality became impaired and A-7 mining was found to be the cause, additional BMP's could be implemented.

4.1.2 CULTURAL RESOURCES AND NATIVE AMERICAN RELIGIOUS CONCERNS

Potential impacts from the Proposed Action may include disturbance of previously undetected, buried cultural remains through construction activities. The Proponent would be required to report these as required in the Cultural Resources Stipulations in Section 4.3.2. Additional potential impacts to cultural resources include unauthorized surface collection and looting of buried materials. Improved access roads would facilitate travel in the area, which may increase the number of people visiting the area, and the potential for unauthorized surface collection and looting. If any areas or locations of traditional gathering areas, religious, or cultural concern to Native Americans are subsequently identified or become known through the Native American notification or consultation process, they would be considered during the implementation phase.

The BLM would take no action that would adversely affect these areas or locations without consultation with the appropriate Native American tribes. All Eligible and Unevaluated sites are avoided by the proposed plan amendment undertaking. Determination of effect for the Amendment 7 Plan of Operations resulted in a No Historic Properties Affected, with WYSHPO concurrence as of February 29th, 2016 (BLM CyFO Cult# 020-2016-053).

4.1.3 WATER (SURFACE AND GROUND)

SURFACE WATER: Surface water could be temporarily and locally affected by the Proposed Action. During the proposed mining process natural drainage patterns would be temporarily disrupted, altering drainages and modifying overland and subsurface flow. Due to the loss of vegetation, biological crusts, and desert pavement, run-off from the proposed mining areas may transport more sediment, water, and other pollutants to downstream water features than before the area was mined. Runoff from the mine area may also be more acidic and salty than pre-disturbance runoff due to the acidic and salty sub-soils exposed by mining. Larger ephemeral channels would be temporarily directed around open pits during active mining stages and weed-free straw bale sediment barriers would be utilized as sedimentation control measures.

GROUNDWATER: These mining operations will not require drilling into any known aquifers to facilitate mining activities. Therefore, BPM mining activities in this area will not disturb these aquifers or affect their water quality. Due to the depth of the water table in the areas where public lands would be mined, groundwater would not be affected by mining. Pollutants would have to penetrate through tight shales and bentonites into the water table; therefore, water would be more likely to evaporate than to infiltrate. If a large storm event would exceed the capability of BPM's berms, deleterious material could flow offsite and affect surface and groundwater. Sediment and other pollutants could be transported from the site by wind, water, or mining-related activities (bentonite on haul truck tires falling off out of the mine area) could introduce pollutants that may eventually reach the groundwater. The Wyoming Water Quality Land Health Standard #5 (Water Quality) for Healthy Rangelands of Wyoming would fall below the threshold to meet the standard if the WDEQ determined that watersheds in the area were impaired. The source of the impairment could be due to the proposed mine activities, other area causes, or a combination of both.

4.1.4 WETLANDS, RIPARIAN AND AQUATIC RESOURCES

Wetlands and riparian areas found on some of the private (Carr) would not be disturbed by proposed mining or hauling activities. No other wetlands or riparian areas were delineated within the A-7 Plan area, therefore no such areas would be affected by mining on public lands within the area. Invasive, non-native plant species could become established on or near the proposed mine area and spread to downstream or downwind riparian areas, offsite wetlands, and/or aquatic habitats which could weaken plant communities, system stability and functionality. Nearby offsite riparian areas, wetlands, aquatic habitat, and associated biota could also be affected if the proposed mining activities cause head-cutting of drainages.

4.1.5 GEOLOGY AND MINERALS

OVERBURDEN: If bentonitic overburden comes into contact with subsoil or topsoil during the removal, storage, or reclamation process, the soil's acidity level would rise and it could become uninhabitable by plants. When situations like this occur, reclamation can be difficult.

LOCATEABLE MINERALS: Under the Proposed Action, commercial quantities of bentonite would be removed from the Cretaceous Mowry and Thermopolis shales. Mining would disrupt the natural stratigraphic order of beds within the open pit areas, and disturb overburden, as well as top and subsoil profiles, as described in the mine plan. No other locatable mineral resources would be affected by the Proposed Action. No mitigation is planned for this impact.

SALEABLE MINERAL MATERIALS: The Proposed Action would have a minimal impact on the limited saleable mineral resource located on public lands proposed to be mined. No commercially important deposits of sand and gravel, decorative rock, flagstone, or other saleable materials are known in the A-7 Plan area.

LEASEABLE MINERALS: There are no active leasable minerals/oil and gas leases in the A-7 Plan area. Access to leasable mineral resources would not be impacted as a result of the Proposed Action.

4.1.6 PALEONTOLOGICAL RESOURCES

Paleontological resources in the proposed mining area may be affected under the Proposed Action, which would involve mining the Mowry and Thermopolis shales. These formations are rated as a Potential Fossil Yield Classification (PFYC) of 3a, meaning that they may have a Moderate potential to contain vertebrate fossils.

4.1.7 SOILS

Soils disturbed by mining and related activities would be locally and permanently affected. Microorganisms living in stockpiled topsoil have a short lifespan due to the lack of oxygen, lack of new organic material, lack of water, and an increase in depth to surface. The presence of these microorganisms in soil reduces water and wind erosion, holds water in the soil, and prevents weed establishment. The castback mining system is designed to quickly reclaim disturbed areas so topsoil remains viable and will more easily support re-vegetation efforts. Live-spreading is currently the best method for reclamation because topsoil that is removed from an open pit is immediately placed on the area that has already been mined, backfilled and recontoured, preserving the biological and physical qualities of the topsoil. Loss of topsoil's biological viability as a result of stripping and stockpiling would increase as the length of stockpiling time increases (loss would occur very rapidly at first and then gradually taper off).

WDEQ regulations require that all soil stockpiles be separated from all other materials by a buffer zone of at least a bulldozer width to prevent contamination. Most of the soils in the proposed A-7 Plan area contain a thin surface layer that is marginally suitable as topsoil. Subsoils are generally unsuitable due to high exchangeable sodium (high SAR) and inclusion of salts resulting in high EC. Because of this, only portions of the topsoil of different soil units could be used as suitable topsoil and subsoil material for reclamation. BPM proposes to salvage saline, sodic, or saline-sodic subsoils, and keep them segregated from suitable topsoils. Such subsoils would be used as subsoil only, on sites to be reclaimed post-mining. No material would be salvaged as topsoil from areas devoid of vegetation. Areas of rock litter or desert pavement frequently form where wind and water erosion washes away the soil and leaving the rock cap. The cap then prevents further erosion of the soil or subsoil in the area. Once the proposed mining has taken place and the land has been reclaimed this rock litter layer may no longer be present, increasing the amount of soil on the surface that has the potential to be eroded from the area.

4.1.8 VEGETATION

Vegetation in the proposed disturbance footprint would be directly affected by the Proposed Action. Native vegetation and topsoil would be removed in all proposed mining and haul road areas. After mining is complete, subsoil and topsoil would be placed back on the surface. If castback mining proceeds in a timely manner, some of the soil biota and other microorganisms associated with healthy, living soil would still be alive to help the newly planted seeds reestablish. Success of reclamation depends largely on the timeliness and cleanliness of the topsoil replacement process, and future topsoil quality and quantity depends on reestablishment of vegetation.

Vegetation native to the proposed mining area is adapted to the local climate, soils, native herbivory, and other ecological variables unique to the area to be mined. If reclamation is not properly conducted, a different type of plant community could eventually replace native species. Often, even successful reclamation will result in a change from the existing native plant community that occupied the site prior to being disturbed. In some situations, one or more non-native plant species may have to be used to achieve the desired state and future uses.

Until vegetation on disturbed sites consists of plant communities appropriate to the site that are resilient, diverse, and once again able to recover from disturbances, vegetation communities would fall below the threshold of Standards #3 (Upland Vegetation) and #4 (Wildlife) for Healthy Rangelands of Wyoming.

Disturbing up to 123.46 acres of public land could allow invasive weed species to germinate and establish in disturbed areas. Speedy revegetation with native plants would be necessary to prevent a non-native weed invasion. Due to low precipitation in this area (five to nine inch precipitation zone) and the presence of very shallow, saline soils, revegetation is often a slow process taking from two to twenty years or more. Any islands of native vegetation left in mined areas would aid in the spread of native plants throughout the disturbance. If topsoil is spread live viable native seeds are still present which aids in reestablishment of native vegetation on reclaimed areas.

4.1.9 INVASIVE, NON-NATIVE PLANT SPECIES

Invasive and non-native plant species occur in the area of the proposed A-7 Plan and could increase as a result of new mining. Annual, invasive or non-native weed species are less likely to become established in an area if seeding is completed soon after mining. Seeding of topsoil stockpiles would be required mitigation and would decrease the potential for weeds to spread and contaminate topsoil. Some weed species that commonly establish in post-mining include: cheatgrass (*Bromus tectorum*), halogeton (*Halogeton glomeratus*), kochia (*Kochia scoparia*), and Russian thistle (*Salsola kali)*. If cheatgrass were to establish, it could form a monoculture outcompeting native species, reducing species diversity, decreasing sagebrush establishment, and creating a volatile fuel source for fires. Halogeton pulls salt to the surface, creating a saline environment few native plants can survive within.

Weeds would be controlled/eradicated using BLM-approved methods and herbicides, and their management would be the sole responsibility of BPM. Where weed infestations are noted on BLM lands associated with this modification, all vehicle access would be limited to only necessary routes and would be controlled to minimize travel in the infested area until weed removal is accomplished. Vegetation would be reestablished and weed-free seeds and hay for mulch would be used in the proposed mining area. Cleaning vehicles, equipment, and materials before they enter public land would help reduce the spread of invasive, non-native plant species.

A list of Wyoming state-listed noxious weeds is provided below (WWPC, 2011). These weeds would need to be controlled should they begin to grow on areas disturbed by mining in the A-7 Plan area. Cheatgrass would also need to be controlled in the proposed project should it begin to grow in mined or reclaimed areas.

1) Field bindweed (*Convolvulus arvensis* L.)
2) Canada thistle (*Cirsium arvense* L.)
3) Leafy spurge (*Euphorbia esula L.*)
4) Perennial sowthistle (*Sonchus arvensis L.*)
5) Quackgrass (*Agropyron repens (L.) Beauv.*)
6) Hoary cress (*Cardaria draba & pubescens*)
7) Perennial pepperweed (*Lepidium latifolium L.*)
8) Ox-eye daisy (*Chrysanthemum leucanthemum L.)*
9) Skeletonleaf bursage (*Franseria discolor Nutt.*)
10) Russian knapweed (*Centaurea repens L.*)
11) Yellow toadflax (*Linaria vulgaris L.*)
12) Dalmation toadflax (*Linaria dalmatica (L.) Mill.*)
13) Scotch thistle (*Onopordum acanthium L.*)
14) Musk thistle (*Carduus nutans* L.)
15) Common burdock (*Arctium minus* (Hill) Bernh.)
16) Plumeless thistle (*Carduus acanthoides L.*)
17) Dyers woad (*Isatis tinctoria L.*)
18) Houndstongue (*Cynoglossum officinale L.*)
19) Spotted knapweed (*Centaurea maculosa Lam.*)
20) Diffuse knapweed (*Centaurea diffusa Lam.*)
21) Purple loosestrife (*Lythrum salicaria L.*)
22) Saltcedar (*Tamarix spp.*)
23) Common St. Johnswort (*Hypericum perforatum*)
24) Common Tansy (*Tanacetum vulgare*)
25) Russian olive (*Elaeagnus angustifolia L.*)

4.1.10 WILDLIFE, MIGRATORY BIRDS AND RAPTORS

WILDLIFE: The Proposed Action would affect wildlife that live near or move through the proposed mining area, as well as their movements through the A-7 Plan area. Large areas of suitable habitat exist on public lands surrounding the mining areas to which game animals can move; big game populations would be affected by fragmentation and disruption from mining activities. Larger wildlife species such as mule deer, pronghorn, and coyotes, would have to adapt their movement patterns to avoid the proposed mining areas during operations. Habitat in and adjacent to the proposed mining area would become less suitable until reclamation was successful.

Smaller animals such as amphibians and reptiles whose home range is much smaller would be directly affected by the Proposed Action. Displaced animals would have to move to a new area, which may already be fully occupied, resulting in stress, extra competition, and probable mortality. An unknown number of these small animals would be lost during the mining either directly by machinery or indirectly through habitat loss; their numbers would probably not rise to current levels again until the habitat in the disturbed area would be fully reclaimed to pre-mine conditions. Their returned presence in the reclaimed area would help increase the aeration and permeability of the soil and improve the overall health of the soils and vegetation.

RAPTORS: The Proposed Action could affect bald and/or golden eagles if any are nesting in or near the A-7 Plan area. Proposed mining would temporarily alter nearby hunting areas. This would be a factor until the affected area is reclaimed and small prey species have returned.

OTHER MIGRATORY BIRDS: Migratory birds, including sagebrush obligate species, would avoid the area until successful reclamation is achieved. Assuming the area would be fully reclaimed to conditions similar to pre-mining at some point in the future, the habitat would once again be suitable for these species.

4.1.11 THREATENED & ENDANGERED SPECIES AND BLM SENSITIVE SPECIES

BLM SENSITIVE SPECIES: The Proposed Action would remove or impact habitat and cause fragmentation and wildlife avoidance of larger habitat areas for several BLM Sensitive species, including the following: mountain plover, sage sparrow, Brewer's sparrow, sage thrasher, loggerhead shrike, white-tailed prairie dog, and sage-grouse. Assuming the area is fully reclaimed to conditions similar to pre-mining at some point in the future, the habitat may once again be suitable for these BLM Sensitive species although possibly not as suitable as it was before it was mined based on the success of the proposed mitigation. Habitat would also be fragmented, making adjacent habitat less suitable. Additional weeds, disturbance, human activity, changes in water quality, modified hydrologic and sediment regimes, and habitat destruction would have negative impacts on BLM Sensitive species.

This area is occupied general sage-grouse habitat, therefore, sage grouse in the area could be negatively affected by further fragmentation of this marginal habitat due to mining. Mountain plover are a BLM Sensitive Species and protected under the Migratory Bird Treaty Act (MBTA), 16 U.S.C. 703. Mountain plover conservation management is directed by Record #4121 in the *Cody Field Office Approved Resource Management Plan* (2015) states, "Implement conservation measures, terms and conditions, and appropriate BMPs and reasonable and prudent measures within existing state programmatic biological opinions for the mountain plover." The Proposed Action would remove mountain plover habitat until reclamation of the mined area was completed. Full reclamation of area habitat would take years.

4.1.12 LIVESTOCK GRAZING AND RANGE MANAGEMENT

The Proposed Action would temporarily affect 123.46 acres of public rangeland and a total of 3.8 AUMs over the life of the mine. Reclamation of native grasses post-mining would result in much of the pre-mine forage becoming available to livestock and wildlife. Approximately 3.8 AUMs would be temporarily lost as mining would remove available forage until the mined areas were successfully reclaimed.

Reclaimed mining areas may be fenced out of grazing allotments to protect reclamation seeding. However, cattle are usually allowed to continue grazing on reclaimed lands post-mine. This can be detrimental to both grazing and the mine reclamation effort. Grazing of newly reseeded plants stresses seedlings and makes it very difficult for them to survive, spread, or create healthy rangeland. Livestock often pull up small plants and seedlings. Grazing during the early stages of revegetation can also lead to increased weed growth. Native seedlings are more desirable to cattle and are quickly grazed off leaving a barren area open to possible weed establishment.

4.1.13 SOCIOECONOMICS

Under the Proposed Action, the proposed A-7 Plan would be approved and bentonite mining would proceed as planned. The A-7 mine would continue to gainfully employ approximately 10 BPM employees, 67 mill employees, and additional subcontractors over the life of the mine. These service companies would continue to provide heavy equipment and labor to strip and salvage soil and overburden, expose, mine and haul the clay, and conduct reclamation and seeding.

4.1.14 RECREATION AND VISUAL RESOURCE MANAGEMENT (VRM)

RECREATION: The proposed A-7 Plan could temporarily disrupt recreational uses within and surrounding the immediate project area. Mining would temporarily reduce opportunities for local recreationists to enjoy the mining area on approximately 123.46 acres of public land.
The mine would temporarily affect the immediate view from nearby roads for those appreciating local scenery near the proposed mine area until reclamation is successful. Wildlife viewing and hunting may be reduced in the short term, though post-reclamation or during non-disruptive activities, wildlife may still use the area. Over time, some recreational activities could improve with successful reclamation.

The proposed project will further alter the recreational setting characteristics from middle country to front and rural settings. Continued alteration of the settings could displace recreational users to alternative locations, which may not fulfill users' desired beneficial outcomes. User conflicts between visitors and mining operators may increase as the proposed project would increase mining activities in the area. Such conflicts may include an increase of mining and recreational traffic on the existing haul routes which may increase the chances of user conflicts and public health and safety, or reclamation work on mining pits may be compromised by off-road motorized use and hill climbing.

Although impacts to recreation may be minimized through the mine operation procedures, mining safety protocol, and through mitigation measures stipulated from other resource programs, impacts to recreation may still be evident.

VRM: The proposed project would impact visual resources by altering the natural elements of form, line, color, and texture exhibited in the landscape. Visual impacts could be observed by those traveling the bentonite access road that intersects the project area. Surface disturbing activities would be noticed by the degree of contrasts against the surrounding natural elements. Reclamation of mined lands could mitigate these effects over time. Although the proposed activity will create new contrasting elements against the surrounding natural elements within the immediate project area, the new disturbed areas will increase the present level of unnatural, anthropogenic contrasting elements as currently observed surrounding the project area. Although mitigations addressing impacts from other resource programs will benefit the scenic quality unit by minimizing most of the long term contrasting elements, the landscape within the project area may continue to exhibit contrasting elements of form, line, texture, and color.

4.2 Alternative II - No Action

4.2.1 Air Quality

There would be no additional effect on current air quality under Alternative II as the proposed A-7 Plan would not be approved. Particulate matter and other contaminants from exhaust would not be emitted into the air by equipment or haul trucks used in the proposed mining process.

4.2.2 Cultural and Historical Resources and Native American Religious Concerns

Currently, potential impacts to cultural resources include unauthorized surface collection and looting. Additionally, unauthorized off highway vehicle use of the proposed mining area has the potential to impact cultural resources. Under the No Action Alternative, these potential impacts would remain at existing levels. There would be no additional impacts on cultural resources from mining under Alternative II because surface disturbance under the proposed Plan of Operations would not be approved. No impacts to Native American Religious concerns would occur under the No Action alternative, as the BLM would take no action that would adversely affect these areas or locations.

4.2.3 Water (Surface and Ground) and Floodplains

There would be no effect on surface water, ground water, or floodplains as the A-7 Plan would not be approved.
Alternative II proposes the least effect on surface water, as there would be no surface disturbance, leaving the vegetation, soil, and natural drainage patterns in place to naturally control surface water.

4.2.4 Wetlands, Riparian Areas, and Aquatic Resources

There would be no effect on wetlands, riparian areas, or other aquatic resources under Alternative II as the proposed A-7 Plan would not be approved and the proposed surface disturbance would not occur.

4.2.5 Geology and Minerals

There would be no effect on the geology or minerals of the area under Alternative II as the proposed A-7 Plan would not be approved and the proposed surface disturbance would not occur.

4.2.6 Paleontological Resources

There would be no effect on paleontological resources under Alternative I because the proposed A-7 Plan mining would not be approved and the proposed surface disturbance would not occur.

4.2.7 SOILS
There would be no effect on soils under Alternative II as the proposed A-7 Plan would not be approved and the proposed surface disturbance would not occur.

4.2.8 VEGETATION
There would be no effect on vegetation under Alternative II as the proposed A-7 Plan would not be approved and the proposed surface disturbance would not occur.

4.2.9 INVASIVE, NON-NATIVE PLANT SPECIES
There would be no new effects of invasive and non-native species under Alternative II as the proposed A-7 Plan would not be approved and no new disturbance would occur.

4.2.10 WILDLIFE, MIGRATORY BIRDS, AND RAPTORS
There would be no effect on wildlife under Alternative II as the proposed A-7 Plan would not be approved. Wildlife use of the area would continue at current levels and habitat loss would not occur. There would be no effect on migratory birds or raptors under Alternative II as the proposed A-7 Plan would not be approved.

4.2.11 Threatened and Endangered Species and BLM Sensitive Species
There would be no effect on Threatened or Endangered species within the proposed A-7 mining area. BLM Sensitive Species such as the mountain plover would not lose habitat or potential suitable habitat under Alternative II, as no new surface disturbance would be approved.

4.2.12 LIVESTOCK GRAZING AND RANGE MANAGEMENT
There would be no effect on livestock grazing or range management within the proposed A-7 mining areas under Alternative II.

4.2.13 SOCIOECONOMICS
If Alternative II was selected BPM would experience an economic effect on its employees and subcontractors as the A-7 Plan would not be approved. The supply of bentonite to the mill east of Lovell would be reduced under this Alternative, which could in turn, affect the entire operation. No impact to agriculture would occur under Alternative II. Recreational activities in the area such as hunting, wildlife viewing, and driving for pleasure, along with their economic benefits would not be affected.

4.2.14 RECREATION AND VISUAL RESOURCE MANAGEMENT (VRM)
There would be no effect on recreational uses of the public land or on VRM as the A-7 Plan would not be approved.

4.3 Mitigation and Monitoring Measures/Stipulations
Mitigation and monitoring measures which would be implemented by BPM are part of the Proposed Action. They are summarized and numbered in italics below. The following mitigation measures and monitoring requirements are designed to prevent unnecessary and undue degradation during mining and reclamation activities on all Amendment 7 areas.

4.3.1 MITIGATION AND MONITORING MEASURES

Air Quality

(1) BPM will control fugitive dust during mining operations by employing dust suppression measures. To control fugitive dust generated by haul trucks, haul roads will be kept watered by BPM in active mining areas by using a water truck equipped with a spray bar or other BLM-approved method during mining and hauling activities.

Water Quality and Riparian-Wetland Area Management

(2) BPM will follow all mitigation measures outlined in its Mine and Reclamation Plans regarding water quality. Modification of the hydrology of riparian and wetland areas, including jurisdictional waters of the United States, will be avoided whenever possible. Where hydrology is modified, through drainage will be reestablished during final reclamation. Channel design for both temporary and permanent diversions will match pre-mine channel gradients and cross-sectional shapes and dimensions.

(3) BPM will maintain and implement a Storm Water Discharge Permit (SWDP) and associated Storm Water Pollution Prevention Plan (SWPPP) as required by the WDEQ-WQD, per Section 401 of the CWA in the State of Wyoming.

(4) Mining areas will be properly bermed until reclamation is implemented (recontouring, topsoiling, and reseeding). Berms will prevent run-off and sediment-laden water from leaving the pits and open mining areas. Water diversions created during the mining process will allow water to flow around the proposed mining area. Containment berms will be constructed around stockpiles to prevent runoff from contaminating native soils and minimize material loss. Temporary overburden stockpiles will not be placed so as to block intermittent or perennial stream channels.

(5) Fabric fences or certified weed-free straw bale check dams will be installed at discharge points into natural channels. These structures will be moved as needed to accommodate active mining areas. Berms will also be installed around pits and haul roads. Through drainage is required to be reestablished during final reclamation.

(6) During monitoring special attention will be paid to small drainages that cross any of the roadways. Indications of accelerated erosion or head-cutting will necessitate installation of rip rap to slow water flows and reduce the sediment loading downstream. If gradients are too steep and resources are not available to construct properly designed grade control structures the channel will be constructed with more meanders and a higher sinuosity to reduce velocities and erosive forces. In addition, rock and boulder rip-rap may be placed into the outside of bends to prevent accelerated erosion of the channel during high flow events. If sufficient rock is not available, bends can be constructed with shallower radii reducing the chances for flows to undercut banks. These reclamation efforts will restore the mined area to stable channel characteristics and similar water and sediment discharge patterns.

(7) Sediment control during reclamation efforts will be provided by using a combination of Best Management Practices (BMP's). Following final contouring and topsoiling of a reclaimed area it will be ripped along contour to reduce compaction as well as create furrows that reduce runoff potential. In addition, BPM may elect to utilize weed-free mulch to assist in reduction of runoff potential and increase moisture retention. For reclaimed drainage channels straw bale check dams may be placed within the postmine drainage to serve as energy dissipaters/sediment filters. Straw bales used on federal lands must be certified weed-free.

One double set of dams would be placed at the lower boundary of the disturbance, with further check dams installed up-drainage if conditions warrant. These check dams will remain in the drainage until revegetation has been established.

(8) Over time, if erosional features such as head cuts develop within a reclaimed channel BPM will implement one of several remediation measures depending on conditions present. These mitigation measures include, but are not limited to: (1) armoring problematic channel reach with rock, (2) installation of rock check dams to reduce channel gradient, or (3) construction of a drop structure(s) using rock or gabion baskets that are keyed into the channel bed and banks.

(9) In the event BPM temporarily closes a pit, interim management procedures to stabilize the site will be implemented. Berms will be constructed around the pit where highwalls are present. A berm will also be installed at the pit entrance ramps. Bentonite and spoil material stockpiles will be bermed to prevent off-site sedimentation. Drainages that have the potential to receive deleterious material if the constructed berms were to fail would have check dams installed. Berms will be stable, making the check dams precautionary backup measures.

(10) If groundwater or surface quality in the area is determined to be impaired as a result of bentonite mining, Best Management Practices (BMPs) will be implemented to address the impairment. Water resource mitigation is included in BPM's A-7 Plan of Operations submission. BPM will also follow the specifications of their current Storm Water Discharge Permit (SWDP) and Storm Water Pollution Prevention Plan (SWPPP) to comply with Section 401 of the CWA and would coordinate with the U.S. Army Corp of Engineers prior to placing fill in any water feature to facilitate compliance with Section 404 of the CWA.

Soils and Vegetation Mitigation

(11) Associated disturbance relative to mining will be kept to a minimum in order to prevent unnecessary and undue disturbance of native soil profiles. All disturbed areas will be seeded in a timely manner to promote plant growth and further reduce erosion.

(12) BPM will ensure proper separation between topsoil and subsoil material salvaged from mine areas and overburden removed from pits. If it was shown that a particular pit has the potential for acidic, deleterious or toxic material near the surface, BPM will cover the material with at least two feet of a more neutral spoil material from adjacent pits in a lateral castback procedure, or bury that layer deeper in the profile during backfill.

(13) BPM will use live-spreading of topsoil whenever possible and stockpile topsoil for as short a time as possible before re-spreading it. BPM will also seed its topsoil stockpiles to prevent weed growth, reduce erosion, and maintain the soil's biological integrity. BPM would seed subsoil and topsoil stockpiles with Seed Mix No. 1 described below if the stockpiles would not be respread within 6 months.

(14) Topsoil replacement will take place to proper depth to allow re-establishment of vegetation. Replaced topsoil will be left in a roughened state to increase micro-topography and enhance moisture-harvesting capacity of soil. Soil amendments, such as gypsum, straw, or woodchips, may be used by BPM with BLM approval to create soil conditions more amenable to plant growth. If BPM decides to try mulching, they must first contact the BLM for approval.

(15) Reclamation Seed Mix: Within three to five years following the mining of bentonite, the A-7 Plan area will be recontoured and reseeded using the PLS (pure live seed) mixes listed below, as revised by the BLM-CYFO to remove non-native seed species such as Russian Wildrye, and increase the seeding rates of several species* in the mix. (Note: BLM requires the proposed Russian Wild Rye be replaced with a similar native species such as Basin or Canada Wild Rye). A vegetative community dominated by native shrubs and grasses will be reestablished over time. Mitigation measures include use of approved seed mixtures and seeding application rates to reestablish vegetation over time to pre-mine or better conditions. Prior to any seed mix revisions or substitutions, BPM will contact the BLM and the WDEQ for approval of the proposed changes.

(16) All seed used on public lands will be certified cheatgrass and noxious weed-free by certified laboratory testing and will conform to BLM seed policy IM No. 2006-073 (Appendix C). Hay or straw used for check-dam construction or mulching will be certified to be cheatgrass and noxious weed-free. Also as per IM-2006-073, "Copies of the seed lab test results, including purity and germination (viability) rate, must be forwarded to the appropriate BLM office prior to seed application. If the seed does not meet the BLM and State/Federal standard for noxious weed seed content or other crop seed allowances, it shall not be applied to public land." BPM is responsible for reclamation until the reclaimed lands are fully released from the reclamation performance bond.

(17) Seed will be planted in the fall or early winter (occasionally in early spring) as soon as possible after topsoiling. BPM will leave mosaics of undisturbed lands between adjacent pit sequences, which will serve as a seed source for reclamation and act to slow water runoff and reduce erosion and sedimentation.

Noxious or Invasive Weeds

(18) BPM is responsible for managing all noxious and undesirable invading plant species in mined and reclaimed areas including cheat grass, Russian olive, and tamarisk, until revegetation activities are determined to be successful and the bond is released for a given area. In order to decrease the spread of noxious weeds onto public lands BPM will regularly inventory all areas and access routes for the presence of weeds. BPM personnel will be trained to identify weeds and conduct on-going monitoring of weeds. Noxious weeds will be monitored throughout A-7 area mining operations. If noxious or invasive weeds are found anywhere in the A-7 mine area or along haul roads, BPM will take action to remove the weeds with the assistance of Big Horn County Weed and Pest and coordinate with the BLM Cody Field Office to file a Pesticide Use Proposal. BPM will also follow the BLM seed policy IM No. 2006-073 (Appendix C), which will help prevent weed spreading and infestations.

(19) Newly arriving equipment will be cleaned free of plant material off site prior to arriving at the A-7 Plan area.

Wildlife Resources Mitigation: (BLM Sensitive Wildlife Species, Raptors and Migratory Birds)

(20) BPM will implement mitigation and monitoring measures developed with the BLM and USFWS to prevent take of migratory birds and to comply with the Migratory Bird Treaty Act. As a precaution to not cause illegal "take" of protected species under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, and in conformance with BLM and USFWS suggestions, BPM will:

(a) Conduct nest searches in migratory bird and Mountain plover habitat prior to and during ground disturbing activities between April 10th and July 15th. If nesting migratory birds or mountain plover are found, mining operations will halt until the BLM and the USFWS are consulted for further action.

(b) BPM will conduct nest searches within 72 hours of disturbance of previously undisturbed areas for migratory birds and BLM Sensitive Species (which include mountain plover and greater sage-grouse) between April 10th and July 15th.

(21) BPM will monitor the A-7 mine area for raptors between February 1st and July 31st and notify the BLM if any nesting raptors will be affected by mining activities.

(a) Between February 1 and July 31, BPM will monitor existing raptor nests as well as the area within 0.5 miles of any A-7 area disturbance for nesting raptors on highwalls, cliffs, and trees. Mining will stop if nesting birds are detected until the birds have fledged and can leave the nesting area unless an appropriate mitigation plan is developed with the BLM and the USFWS. A mitigation plan would provide short term protection of the habitat only; over the long term, this habitat would be degraded until reclamation is substantially complete.

Reclamation and Visual Aesthetics

(22) Reclamation will be conducted concurrently with mining as much as possible. Use of mine pit areas for bentonite drying will be kept to a minimum so mine pits can be backfilled, recontoured and reseeded in a timely manner. BPM would ensure that reclaimed slopes blend with surrounding native and reclaimed lands. BPM would also ensure that slopes support post-mining land uses and are stable.

(23) Within 3-5 years following completion of mining, disturbed areas will be recontoured to match the surrounding topography, reestablish drainages, and minimize erosion. The entire disturbed area with the exception of the main haul roads will be topsoiled and seeded using the seed mixes provided previously in this document. If necessary, topsoil stockpiles will be seeded in the fall or spring following placement.

(24) In addition to ensuring that at least two feet of final cover is placed over the reclaimed surface, BPM may utilize rock as a reclamation component. Rock can assist reclamation by creating micro-topography that may ultimately establish wind breaks, reduce erosion potential or create conditions that are more favorable to some shrub species. Surface rock may also be stacked to create wildlife habitat.

(25) Unnecessary and undue degradation of native soils and vegetation and other public resources will not be allowed to occur as a result of bentonite mining under this Plan.

Livestock Grazing Management

(26) BPM will contact the BLM to discuss the timing of mining activity in order to prevent cattle trespass issues as necessary. BPM will notify the BLM-CYFO anytime the natural boundary is in a condition where it no longer serves as a boundary between allotments or when the allotment boundary fence is down.

(27) BPM may selectively fence reclaimed lands to control the pattern and duration of domestic cattle grazing. BPM may install temporary fences around seeded areas in locations heavily used by cattle in order to give seedlings a chance to establish. BPM would be responsible for installation, maintenance, and removal of these reclamation fences. Fences would be removed after bond release unless the surface owner requests that they remain and agree to maintenance in writing.

Preferred Seed Mix 1 – Slopes and Mesa Soil Mix

Grasses	Pure Live Seed/pounds/acre
Indian Ricegrass (Rimrock variety)*	2.0 (increased from 1.0)
Bottlebrush Squirreltail (native)*	1.0 (increased from 0.5)
Bluebunch Wheatgrass(Anatone)	1.0
Sandberg Bluegrass (native)	0.5
Alkali Sacaton (native)*	1.0 (increased from 0.5)
Canada Wildrye (native)	1.5
Basin Wildrye (native)*	2.0 (increased from 1.0)
Thickspike Wheatgrass (native)	1.5
Forbs	
Rocky Mountain Bee Plant (native)	0.5
Lewis Blue Flax (native)	0.5
Annual Wild Sunflower (native)	0.5
Shrubs	
Shadscale (native)	1.0
Gardner's saltbush (native)	3.0
Rubber Rabbitbrush (native)*	2.0 (increased from 1.0)
Basin Big Sagebrush (native)	0.5
Four-wing saltbush (native)	2.0
Wyoming Big Sagebrush (native)	0.5
TOTAL	**21.0 LBS. PLS/acre**

Shrub Seed Mix 2

Grasses	Pure Live Seed/pounds/acre
Bluebunch Wheatgrass*	3.0 (increased from 2.0)
Basin Wildrye*	2.0 (increased from 1.0)
Bottlebrush Squirreltail	2.0
Sandberg Bluegrass	0.5
Forbs	
Rocky Mountain Bee Plant	0.5
Lewis Blue Flax	0.5
Western Yarrow	0.5
Shrubs	
Shadscale	2.0
Four-Wing Saltbrush*	3.0 (increased from 2.0)
Winterfat	1.0
Big Sagebrush*	2.0 (increased from 1.0)
Black Sagebrush	0.5
Fringed Sagebrush	0.5
TOTAL	**16.0 LBS. PLS/acre**

**PLS/Seeding rate increased by BLM-CYFO*

Temporary Seed Mix No. 3

Grasses	Pure Live Seed/pounds/acre
Indian Ricegrass	1.0
Basin Wildrye	1.5 (to replace Russian Wildrye)
Bottlebrush Squirreltail	1.0
Sandberg Bluegrass	0.5
TOTAL	**4.0 LBS PLS/acre**

General Monitoring Plan

Monitoring of mining activities and impacts will take place throughout the duration and area of the A-7 Plan. BPM's contractors conduct mining and reclamation operations. BPM will visit and document mining activities throughout the life of the mine. Monitoring will assess the impacts of mining on surface water runoff, mine area drainage and berm stability, haul road stability, high wall stability, to establish the extent of any spills that may occur and any other surface disturbance impacts. The BPM mining supervisor will work with the contractor's field supervisors to ensure mining is being conducted in a lawful and environmentally responsible manner. He/she will supervise and direct the reclamation of pits. Monitoring of field operations and contact with contractor's field supervisors will occur on an almost daily basis.

BPM monitors all its reclaimed lands post closure for off-site sedimentation, erosion and seeding failures. Off-site sedimentation will be controlled by installation of straw bale or fabric check dams into affected drainages. Unacceptable erosion will be repaired at the first available opportunity.

Seeding will be monitored on a regular basis. If BPM finds vegetation establishment inadequate after three to five growing seasons, BPM would determine the reason for failure and mitigate the problem.

The BLM-CYFO will monitor the A-7 mine and reclamation areas at least twice per year to ensure that mining and reclamation are being completed according to the A-7 Plan of operations and in accordance with federal regulations.

Monitoring will be done during times of non-operation or down time when, due to weather, mining or market conditions, pit areas are not actively being mined but remain open. Occupation of the high wall by raptors, incidence of vandalism, failure of roads, berms or other mining features and the general stability of the pit area and mine site will be noted. This includes monitoring of mine hydrology and wildlife activity. Instances of wildlife mortality will be noted during normal operations and reported to the Wyoming Game and Fish when appropriate.

Noise levels of field operations will be monitored during regular inspections by the Wyoming State Mine Inspector and Federal Mine Inspectors. BMP will operate in compliance with MSHA noise standards.

4.3.2 STIPULATIONS

Stipulations required by BLM relative to the Proposed Action are discussed below. The best mitigation for the site has been included in the Proposed Action and described above. (Note: The Authorized Officer as referred to below is the Field Manager of the BLM Cody Field Office).

Cultural Resources Mining Stipulations (compatible with the current 43 CFR 3809 regulations):

The operator is responsible for informing all persons associated with this project that they may be subject to prosecution for knowingly disturbing, altering, injuring, excavating, removing or destroying any historical or archaeological site, structure, building, or object on Federal lands.

The operator shall immediately bring to the attention of the Authorized Officer any cultural resources that might be altered or destroyed on Federal lands by his/her operations. If archaeological, historical, or Native American resources are discovered, the operator is to suspend all operations that further disturb such materials and immediately contact the Authorized Officer. Any such discovery shall be left intact until the operator is told to proceed by the Authorized Officer.

The Authorized Officer shall evaluate the discoveries brought to his/her attention, take action to protect or remove the resource, and allow operations to proceed within 10 working days after notification to the Authorized Officer of such discovery. The decision as to the appropriate measures to mitigate adverse effects to cultural or paleontological resources shall be made by the Authorized Officer after consulting with the operator.

Before a Plan of Operations is approved, the operator is responsible for the cost of any investigations necessary and any mitigation measures required by the Authorized Officer. The Authorized Officer will provide technical and procedural guidelines for the conduct of the required evaluation and mitigation. After the Plan of Operations is approved, or where a Plan of Operations is not involved, the Federal Government (BLM) shall have the responsibility and bear the cost of investigations and salvage of any cultural (and paleontological) values discovered by the operator.

Special Stipulations

Archaeological Resources Protection Act
No person may excavate, remove, damage, or otherwise alter or deface or attempt to excavate, remove, damage, or otherwise alter or deface any archaeological resource located on public lands or Indian lands unless such activity is pursuant to an issued permit.

Human Remains: If human remains are discovered or suspected, the operator shall suspend operations immediately, physically guard the area, and notify BLM immediately.

Paleontological Resources Mining Stipulations (compatible with the current 43 CFR 3809 regulations):

Standard paleontological stipulations would be applied to any approval to protect vertebrate and scientifically significant paleontological resources within the proposed mine area. If scientifically significant fossils (all vertebrate fossils and their tracks or traces, and some invertebrate or plant fossils identified as rare or important by the scientific community) are discovered, BPM would be required to suspend operations that might further disturb such materials, and immediately contact the BLMs Authorized Officer (Cody Field Manager) so the fossil resources could be assessed. Scientifically significant fossil resources would be removed from the area prior to resumption of mining. The following stipulations apply to any approval of the A-7 Plan of Operations:

1. **Collecting:** The project operator is responsible for informing all persons associated with this project including employees, contractors, and subcontractors under their direction that they shall be subject to prosecution for damaging, altering, excavating or removing any vertebrate fossils or other scientifically significant paleontological resources from the project area. Collection of vertebrate fossils (bones, teeth, turtle shells) or other scientifically significant paleontological resources is prohibited without a permit. Unlawful removal, damage, or vandalism of paleontological resources will be prosecuted by federal law enforcement personnel.

2. **Discovery:** If vertebrate or other scientifically significant paleontological resources (fossils) are discovered on BLM-administered land during operations, the Operator shall suspend operations that could disturb the materials, stabilize and protect the site, and immediately contact the BLM Cody Field Office Manager (Authorized Officer).

3. **Avoidance:** All vertebrate or scientifically significant paleontological resources found as a result of the project/action will be avoided during operations. Avoidance in this case means, "No action or disturbance within a distance of at least 50 feet of the outer edge of the paleontological locality."

4.4 Cumulative Impacts

Cumulative impacts are generally discussed in the *Proposed Resource Management Plan and Final Environmental Impact Statement for the Bighorn Basin* (May 2015). Typical activities are described in that document and are incorporated by reference into this environmental analysis. Cumulative impacts are those that would result from the incremental impacts of the Proposed Action or Alternative II, when added to other past, present and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. These reasonably foreseeable future actions refer to future action projections, or estimates, of what is likely to take place when a given Proposed Action is implemented. They are not part of the Proposed Action, but are projections being made so that future impacts, cumulative and otherwise, can be estimated as required by NEPA.

This Environmental Assessment combines the results of internal scoping, describes the Affected Environment and Environmental Consequences of the alternatives with incorporation of a Cumulative Effects Analysis (CEA) as per CEQ guidelines. The geographic area analyzed for this CEA was determined based on interconnected vegetation types/habitats encompassing the area of the Proposed Action located on public lands east of the Bighorn River. This area, herein referred to as the A-7 Cumulative Effects Analysis Area (A-7 CEAA) includes approximately 37,100 acres of contiguous saltbush fans and flats, Wyoming Big Sagebrush, and exposed rock/soil supporting only sparse vegetation (**Figure 8**). This A-7 CEAA was used to analyze the cumulative effects of the Proposed Action for all resources potentially impacted by said action.

4.4.1 Past, Present, Reasonably Foreseeable Future Actions, and Incremental Effects

Past, present and reasonably foreseeable future actions within the A-7 CEAA include bentonite mining and livestock grazing, discussed below. The area also sustains recreational activities such as hunting, off-highway vehicle use, and other activities such as development of small scale rights-of-way and sand and gravel pits but these land uses are not considered among the primary surface-disturbing uses and, therefore, are not further discussed below.

Past Actions:

BENTONITE MINING: Four companies have mined bentonite within the A-7 CEAA including American Colloid Company (ACC), M-I Swaco, Wyo-Ben and BPM. Reclamation success has generally not kept pace with mining disturbance in the past. Past bentonite mining and road construction in the A-7 CEAA has disturbed approximately 4,500 acres, of which 3,300 of these acres (74%) have been reclaimed and reseeded.

LIVESTOCK GRAZING: Livestock grazing has been a major resource-use activity on all public lands within the A-7 CEAA over the past 100 years. It is difficult to quantify the actual direct and indirect impact that past livestock grazing has had on the A-7 CEAA as much grazing occurred prior to the BLM administering grazing permits in the area. BLM has historically implemented rotational grazing strategies, reductions in authorized use, and utilization limits for key plant species in area allotments. These management changes have strived to provide improved plant recovery time ample residual vegetation relative to livestock grazing.

Present Actions:
BENTONITE MINING: Bentonite mining, reclamation and road construction currently affects approximately 1,500 acres at any given time within the A-7 CEAA. Reclamation of mining disturbance takes place concurrently with mining as a necessary part of the cast-back mining process.

LIVESTOCK GRAZING: Both the A-1 Claim and G' Claim areas are situated within BLM grazing allotment #01025, the Mills Allotment. In this Allotment, approximately 117.33 of the 5575.5 acres (~2.1%) are proposed to be mined under the A-7 Plan of Operations. There are 173 animal unit months (AUMs) currently permitted for livestock grazing in this allotment, stocked at 32 acres/AUM. Approximately 3.7 AUMs would be temporarily lost due to disturbance of 117.33 acres in this allotment. The Black Gulch Area is situated in the Crystal Creek Allotment #01023. Approximately 6.13 acres of the 18,850.5 acres (0.03%) within this allotment are planned to be mined under the A-7 Plan of Operations. There are 300 AUMs currently permitted for livestock grazing in this allotment stocked at 63 acres/AUM. Approximately 0.1 AUM would be temporarily lost due to disturbance of 6.13 acres in this allotment. A total of 3.8 AUMS would be temporarily lost over the life of the A-7 Plan on public lands.

Reasonably Foreseeable Future Actions:
BENTONITE MINING: Bentonite mining will continue to result in an increase in surface disturbance within the A-7 CEAA into the foreseeable future, as well as within the Bighorn Basin. The BLM CYFO has received Plans of Operation for review from BPM (this EA), Wyo-Ben and American Colloid Company which propose to disturb up to 2,675.00 additional acres within the A-7 CEAA over the next 20 to 30 years. Of this total, the A-7 Plan proposes to disturb an additional 123.46 acres within the CEAA. The existing disturbance related to mining and road construction (4500 acres) plus the reasonably foreseeable surface disturbance (2,675.0 acres) totals 7175 acres of surface disturbance within the A-7 CEAA, or 20% of the total area within the 37,100-acre CEAA over the next 20-30-years.

LIVESTOCK GRAZING: The present types and numbers of livestock (cattle and sheep) and the number of days/seasons they graze is expected to continue in the future within the A-7 CEAA without any anticipated increases or decreases. However, with the additional 2,657 acres of land being proposed for mining within the A-7 CEAA in the foreseeable future, and assuming an average stocking rate of 50 acres/AUM, an additional 54 AUMs of forage could be lost over the short term as a result of future bentonite mining within the A-7 CEAA.

Incremental effect of each Alternative

ALTERNATIVE I: Incremental Impact of the Proposed Action
Bentonite Mining: The Proposed Action (A-7 Plan of Operations) incrementally adds 123.46 acres of new mining disturbance within the analysis area (37,100 acres) or 0.33% of the total A-7 CEAA. A cumulative effects/GIS analysis was conducted for this EA taking into account known and projected land uses, known wildlife, Threatened and Endangered, and BLM Sensitive species habitats and nesting sites, and general vegetation communities, along with past, current and proposed bentonite mining and other land uses in the CEAA. Maps illustrating these resources are provided in Figures 5-7.

Livestock Grazing: Up to 123.46 acres of public land, which equates to an approximate total of 3.8 AUMs of public land forage would be temporarily lost to grazing as a result of mining the entire A-7 Plan area over time.

Wildlife: Wildlife habitat is lost and made less suitable through fragmentation and degradation until reclamation is successful. The incremental impact of the Proposed Action would temporarily remove a total of 123.46 acres of native vegetation from existing habitats in the A-7 CEAA. Depending on reclamation success after mining, these acres will provide less vegetative forage and cover for wildlife over time, and could result in further habitat fragmentation in the long term.

Soil, Water, Riparian-Wetland Areas, and Aquatic Habitats: Increased mining and road system disturbance, as well as the effects of livestock grazing can modify hydrology, sediment regimes, and water chemistry which can in turn impact riparian-wetland areas, aquatic habitats and aquatic wildlife species. Soil modifications affect biological and physical viability. As surface disturbance associated with mining increases, soil and water-related impacts incrementally accrue inside and outside of the CEA boundary.

ALTERNATIVE II: Incremental Impact of the No Action Alternative
Alternative II would not add to the incremental effects that already exist in the area because the proposed bentonite mining would not take place.

Cumulative Effects Analysis Summary

Alternative I Proposed Action: If the Proposed Action is approved, the total amount of disturbance within the A-7 CEAA would increase by at least 123.46 acres (0.33% of the total CEAA) within the CEAA over the next twenty years. This would also result in a temporary loss of 123.46 acres of wildlife habitat/forage, and a temporary loss of 3.8 AUMs over the life of the mine. An additional 2,550 acres of land have also been proposed for new mining under four other proposed Plans of Operation recently submitted to BLM by Wyo-Ben and American Colloid Company. This additional proposed mining by all companies would result in a temporary loss of 58 AUMs of livestock forage over the next 20-30 years if approved.

Based on an analysis of the affected environment and environmental consequences of the Proposed Action, including a review of all past, present and reasonably foreseeable future mining, road construction and livestock grazing within the A-7 CEAA, the cumulative effects analysis indicates that, at this time, coupled with the fact that mining takes place concurrently with reclamation, the incremental effects of the Proposed Action can be mitigated or reduced over time. This determination is dependent on reclamation success, recovery times and adequate precipitation, as well as proper implementation of the required mitigation and monitoring measures, stipulations and Best Management Practices described above and in BPM's proposed Mine and Reclamation Plans.

Alternative II – No Action
Alternative II would not add to the incremental effects that already exist in the area because the proposed bentonite mining would not take place.

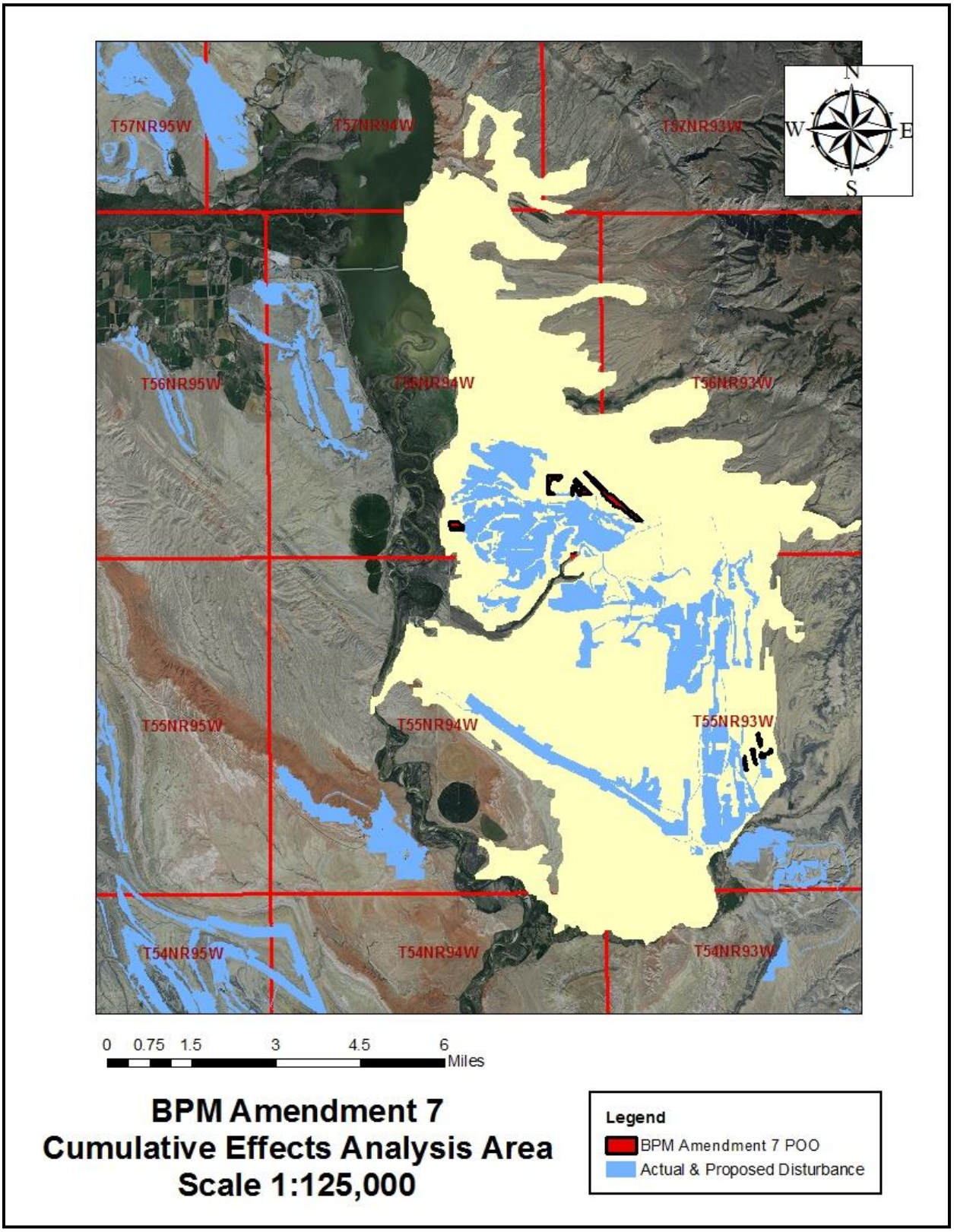


Figure 5. Map of the A-7 Cumulative Effects Analysis Area (A-7 CEAA: 37,100 acres shaded in yellow) used in analysis of cumulative effects of the Proposed Action. The areas shaded in blue are actual and proposed areas of bentonite mining disturbance both within and adjacent to the A-7 CEAA. The proposed A-7 mining areas on public land are shown in red.

4.5 Residual Impacts

Alternative I: Proposed Action

The following are potential residual impacts that could occur as a result of implementation of the Proposed Action:

1) Though recontouring and reseeding of the land would follow the proposed mining process, the landscape would not appear as it did prior to mining. Ridges would be lost or changed, reclaimed road beds may be present, drainages would be altered, and soils and vegetation would be modified.

2) Reseeding would be done during the reclamation process of the Proposed Action, but seeded species may not all reestablish. There would be residual effects on vegetation, as similar species to those that existed pre-mining may not return over the short or long term. Changes in soil characteristics would change the type of vegetation that could grow in the area. The proposed mine area could take decades after initiation of reclamation to achieve vegetative production and species diversity comparable to pre-mine conditions. The area would not function the same ecologically. It may take years to get bond release based on current methods, and pre-mine vegetative diversity and productivity may not be for years after initial disturbance. Also, the disturbed area could be accommodating to weed species; some weed species cannot be eradicated from an area once they establish and would be present in the reseeded areas for the foreseeable future. Changes in vegetation would also affect surface water, soil stability and health, wildlife habitat quality, and grazing.

3) The Proposed Action would involve the removal and replacement of topsoil on mined areas. This handling of topsoil would cause residual effects, as the biota within the soil and the soil's structure and chemistry would be modified during the process. Some soil would be lost to erosion during the proposed mining process. After successful reclamation soils would be able to function as they did before the area was mined and support a diverse vegetative community. Changes in topsoil quality would have a residual effect on vegetation, surface water and related resources, wildlife habitat and grazing.

4) The Proposed Action would cause residual effects to wildlife populations, including those of migratory birds and BLM Sensitive Species, for decades. Even though the area would be reseeded, if the vegetation does not reestablish well or result in species similar to pre-disturbance conditions, wildlife would not be able to use the area as they did prior to mining. Also, habitat fragmentation will continue to occur throughout this, and surrounding, mine areas. Many wildlife species even avoid undisturbed habitat near active mining areas.

5) The Proposed Action may have residual effects on livestock grazing if the vegetation does not reestablish after reclamation. Invasive weed species would also be given a chance to establish in the area, replacing native vegetation. If this happens, the amount of livestock forage in the allotments included in the proposed mining would likely be reduced for years until desirable vegetation reestablishes.

6) The Proposed Action would not result in any unavoidable residual impacts to cultural resources, unless such resources were located during mining or road construction and *not* reported to the BLM authorized officer. Improvement of haul roads could facilitate access to the project area, thereby increasing the potential for additional unauthorized surface collection and looting. However, the Cultural Resource Stipulations listed in Section 4.3.2 would mitigate cultural resource residual impacts.

7) Removal of bentonite under the Proposed Action would constitute an unavoidable long term, post-mining, irreversible and irretrievable (residual) impact on the bentonite resource.

Alternative II: No Action

There would be no residual impacts under the No Action Alternative, as the proposed mining would not be approved; there would be no new disturbance or impact on the land.

5.0 List of Preparers

Preparer: Bureau of Land Management – Cody Field Office

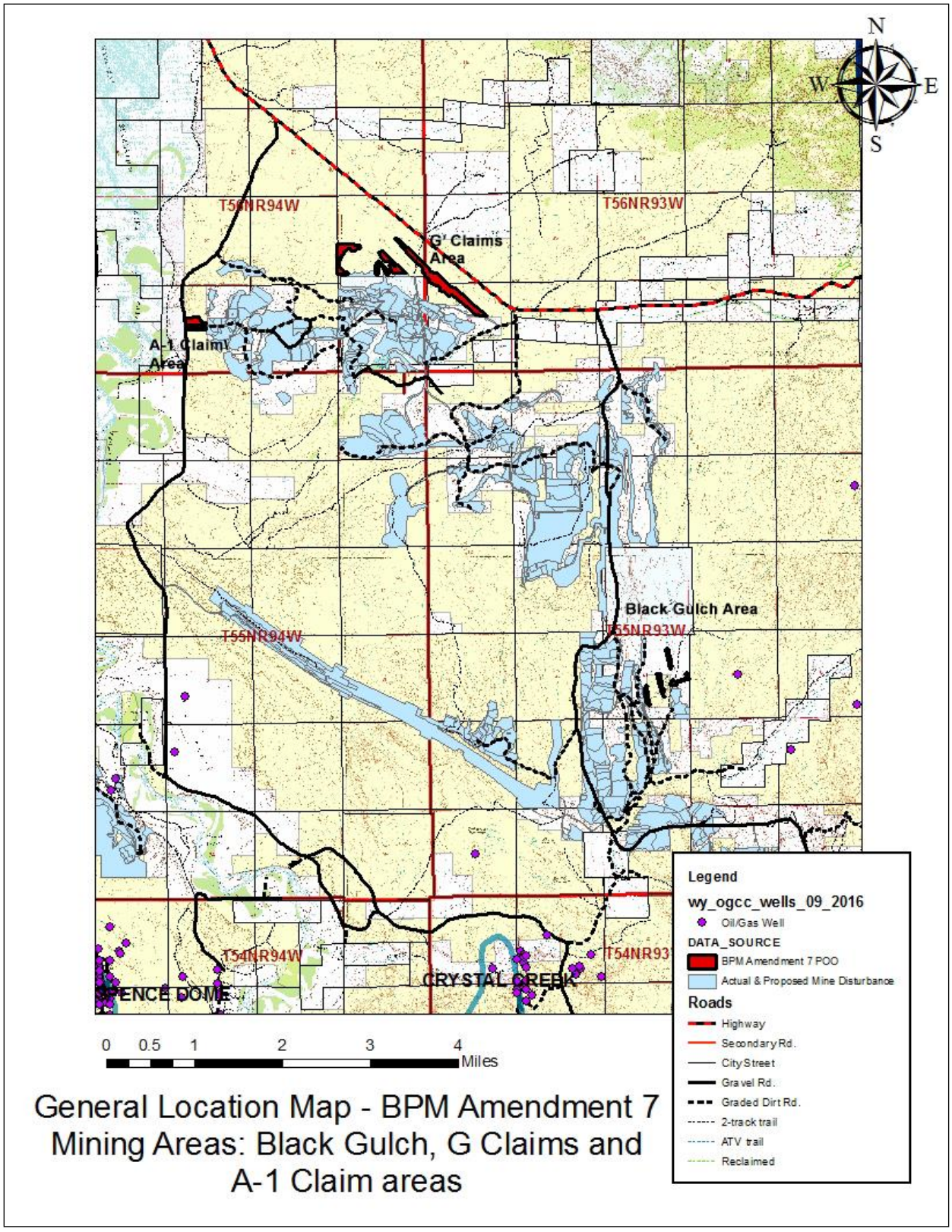
Gretchen Hurley	Geology, Minerals, Paleontology, Air Quality

Reviewers: Bureau of Land Management – Cody Field Office

Alicia Brown	Watershed and Aquatic Resources
Kierson Crume	Cultural Resources and Native American Consultation
Destin Harrell	Wildlife, Migratory Birds, and Special Status Species
Brad Johnson	NEPA
Bryan McKenzie	Range, Vegetation, and Invasive, Non-native Plant Species
Paul Rau	Recreation and VRM
Bradley Johnson	Planning and NEPA

Management: U.S. Bureau of Land Management – Cody Field Office

Chad Krause	Assistant Field Manager Lands and Minerals – Cody Field Office
Delissa Minnick	Field Manager – Cody Field Office



General Location Map - BPM Amendment 7 Mining Areas: Black Gulch, G Claims and A-1 Claim areas

Figure 6. General Land Use: Past, Present and Future: BPM A-7 Plan of Operations Area

No warranty is made by the BLM for use of this data for purposes not intended by the BLM

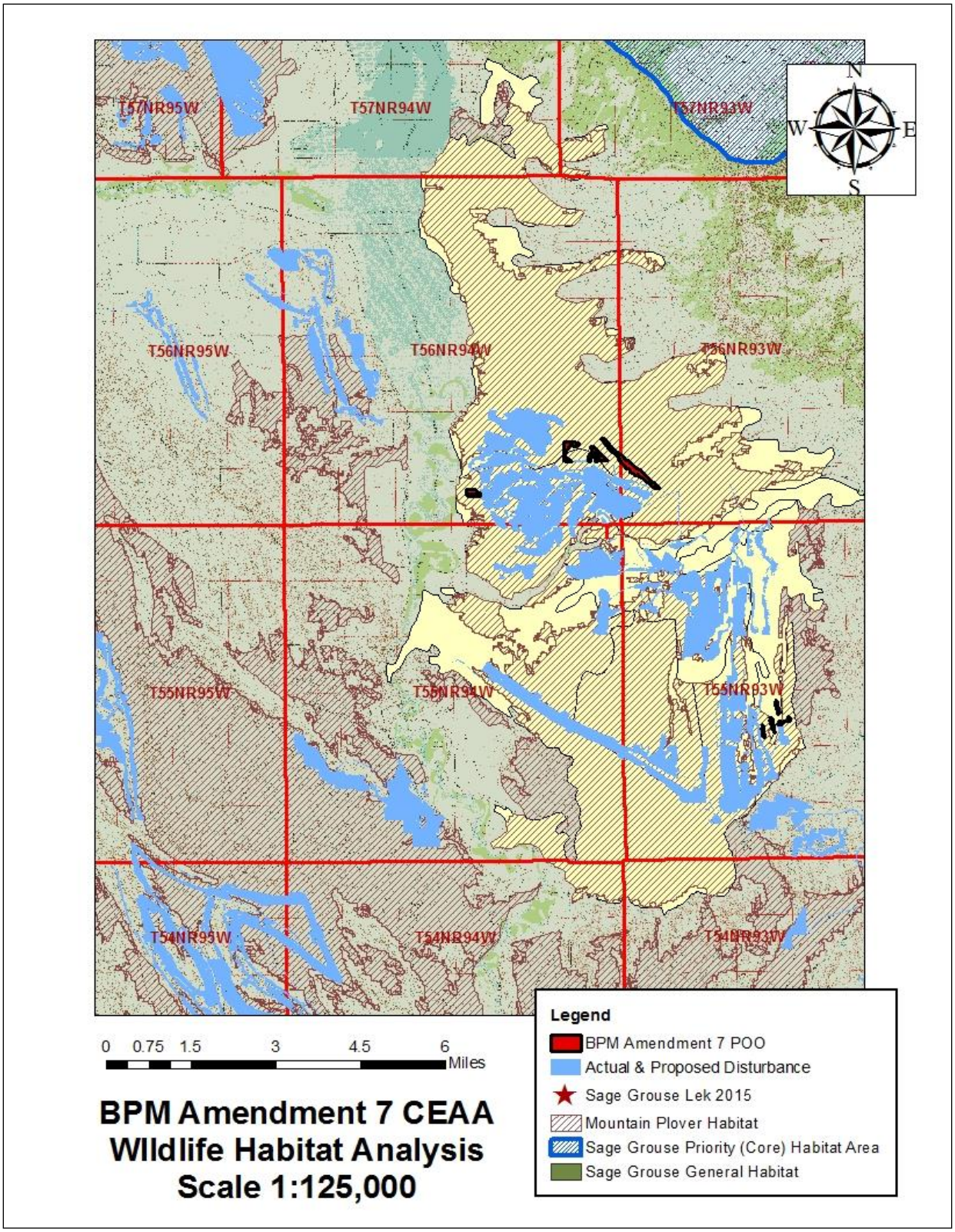


Figure 7. Wildlife Habitat Types: BPM A-7 Plan of Operations Cumulative Effects Analysis Area

No warranty is made by the BLM for use of this data for purposes not intended by the BLM

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Appendix A

Proposed A-7 Mining Areas, Claims, Legal Descriptions, Material Volumes, and Access Road Information

Tabulation of Lands Included in Amendment 7

Black Gulch Area			
Claim	Acres	Ownership	Legal Description
A62, A63	33.19	BPM	Lot 1, Sec. 21, T55N, R93W
A64, A65	40	BPM	SE1/4NE1/4, Sec. 21, T55N, R93W
A66	20	BPM	N1/2NE1/4SW1/4, Sec. 21, T55N, R93W
A59, A60	40	BLM	NW1/2SE1/4, Sec. 21, T55N, R93W
A61	20	BLM	N1/2SW1/4SE1/4, Sec. 21, T55N, R93W
G' Claims Area			
Claim	Acres	Ownership	Legal Description
G1H, G1A	40	BLM	NW1/4SW1/4, Sec. 25, T56N, R94W
G1B	20	BLM	S1/2NE1/4SW1/4, Sec. 25, T56N, R94W
G1F, G1C	40	BLM	NW1/4SE1/4, Sec. 25, T56N, R94W
G1E, G1D	40	BLM	NE1/4SE1/4, Sec. 25, T56N, R94W
G1M, G1N	46.99	BLM	Lot 2, Sec. 25, T56N, R94W
G1O, G1P	46.04	BLM	Lot 1, Sec. 25, T56N, R94W
G3B, G3A	34.86	BLM	Lot 4, Sec. 30, T56N, R93W
G2A	17.07	BLM	N1/2 Lot 1, Sec. 31, T56N, R93W
G2G, G2C	40	BLM	NE1/4NW1/4, Sec. 31, T56N, R93W
G2D	20	BLM	S1/2NW1/4NE1/4, Sec. 31, T56N, R93W
G2E	20	BLM	N1/2SW1/4NE1/4, Sec. 31, T56N, R93W
Claim A1 Area			
Claim	Acres	Ownership	Legal Description
A1	20	BLM	S1/2SE1/4NW1/4, Sec. 34, T56N, R94W
Carr Area	Acres	Ownership	Legal Description
Carr Area 1	550	Lee Carr	NW1/4, S1/2, NW1/4NW1/4NE1/4,S1/2 NW1/4NE1/4, SW1/4NE1/4, Sec. 27, T58N, R97W
Carr Area 2	494	Lee Carr	S1/2NW1/4, SW1/4NE1/4, S1/2, W1/2 of Lot 2, Lot3, Lot 4, Sec. 21, T58N, R97W
Cowley School Section Area	Acres	Ownership	Legal Description
Cowley SS	640	State of Wyoming	Sec. 36, T58N, R97W
Total	2,222.15		

Black Gulch Mine Area: Section 21, T. 55 N., R. 93 W. (Mixed land status)

Table MP-1 Mine Schedule, Overburden and Clay per Claim				
MINE SEQUENCE	**CLAIM**	**BED**	**OVERBURDEN**	**CLAY**
Black Gulch			**Bank CY**	**Bank CY**
Mine Block 1	A66	2nd	36,513	7,938
	A66	1st	30,145	2,444
	A65	1st	3,565	411
			70,223	10,793
Mine Block 2	A65	1st	20,008.6	2,565
	A64	1st	24,755.0	2,710
			44,763.6	5,275
Mine Block 3	A60	3rd	35,216	2,468
	A65	1st	24,200	2,420
	A63	1st	18,811	1,283
			78,227	6,171
Mine Block 4	A61	3rd	38,130	2,444
	A59	2nd	36,663	7,260
			74,793	9,704
Mine Block 5	A60	2nd	42,382.3	5,969
			42,382.3	5,969

A-1 Claim Area: Section 34, T. 56 N., R. 94 W. (Mixed land status)

MINE SEQUENCE	**CLAIM**	**BED**	**OVERBURDEN**	**CLAY**
Claim A1			**Bank CY**	**Bank CY**
Mine Block 1	A1	10th	203,224	19,989
	A1	9th	75,181	22554
			278,405	42,543
Mine Block 2	A1	10th	77,722	9,922
	A1	9th	38,881	11,664
			116,603	21,586
Mine Block 3	A1	10th	45,485	5,856
	A1	9th	64,195	11,132
			109,680	16,988
Mine Block 4	A1	10th	30,524	4,162
	A1	9th	72,193	10,938
			102,717	15,100
Mine Block 5	A1	10th	24,871	3,969
	A1	9th	59,590	10,454
			84,461	14,423
Mine Block 6	A1	10th	16,843	2,807
	A1	9th	50,413	9,002
			67,256	11,809
Mine Block 7	A1	9th	87,923	9,002
			87,923	9,002

G Claim Area: Section 25, T. 56 N., R. 94 W.; Sections 30-31, T. 56 N., R. 93 W.
(Mixed land status)

MINE SEQUENCE	CLAIM	BED	OVERBURDEN	CLAY
G Claims			Bank CY	Bank CY
Mine Block 1	G2E	2nd	181,239	22,942
	G2D	2nd	9,035	1,129
			190,274	24,071
Mine Block 2	G2C	2nd	206,752	21,425
			206,752	21,425
Mine Block 3	G2C	2nd	74,536	9,938
	G2G	2nd	87,862	12,552
	G2A	2nd	8,535	742
			107,933	23,232
Mine Block 4	G2A	2nd	219,930	27,491
	G2G	2nd	15,682	2,614
	G3A	2nd	45,302	7,550
			280,914	37,655
Mine Block 5	G2A	2nd	34,364	2,291
	G3A	2nd	265,426	29,492
	G3B	2nd	37,720	5,389
	G1P	2nd	61,968	5,389
			399,477	42,560
Mine Block 6	G3B	2nd	7,341	1,129
	G1P	2nd	108,900	12,100
	G1D	2nd	123,694	14,552
			239,935	27,782
Mine Block 7	G1D	2nd	41,947	6,453
	G1F	2nd	43,560	5,808
	G1E	2nd	55,499	6,937
			141,005	19,199
Mine Block 8	G1P	3rd	10,648	1,331
	G1O	3rd	217,800	18,150
			228,448	19,481
Mine Block 9	G1C	3rd	122,049	10,769
	G1B	3rd	10,971	968
			133,019	11,737

Mine Block 10	G1O	3rd	88,733	6,655
	G1N	3rd	96,800	7,260
			185,533	13,915
Mine Block 11	G1M	3rd	161,656	12,124
			161,656	12,124
Mine Block 12	G1M	3rd	16,133	1,210
	G1A	3rd	138,747	10,406
			154,880	11,616
Mine Block 13	G1H	3rd	322,667	24,200
			322,667	24,200

Carr Claims Area: Sections 21 and 27, T. 58 N., R. 97 W. (Private Land)

MINE SEQUENCE	CLAIM	BED	OVERBURDEN	CLAY
Carr Claims			Bank CY	Bank CY
Mine Block 1	CARR 1	Upper Windy	659,208	98,881
	CARR 1	Lower Windy	387,200	58,080
			1,046,408	156,961
Mine Block 2	CARR 1	Upper Windy	766,979	115,047
	CARR 1	Lower Windy	435,600	87,120
			1,202,579	202,167
Mine Block 3	CARR 1	Upper Windy	748,264	112,240
	CARR 1	Lower Windy	484,000	96,800
			1,232,264	209,040
Mine Block 4	CARR 1	Upper Windy	574,024	86,104
	CARR 1	Lower Windy	363,000	72,600
			937,024	158,704
Mine Block 5	CARR 2	Upper Windy	308,147	46,222
	CARR 2	Lower Windy	135,520	33,880
			443,667	80,102
Mine Block 6	CARR 2	Upper Windy	370,099	55,515
	CARR 2	Lower Windy	154,880	38,720
			524,979	94,235
Mine Block 7	CARR 2	Upper Windy	546,597	81,990
	CARR 2	Lower Windy	232,320	58,080
			778,917	140,070
Mine Block 8	CARR 2	Upper Windy	444,312	66,647
	CARR 2	Lower Windy	193,600	48,400
			637,912	115,047

Cowley School Section Area: Section 36, T. 58 N., R. 97 W. (State land)

MINE SEQUENCE	CLAIM	BED	OVERBURDEN	CLAY
Cowley SS			Bank CY	Bank CY
Mine Block 1	Cowley SS	F2	1,290,667	258,133
	Cowley SS	F3	363,000	72,600
			1,653,667	330,733
Mine Block 2	Cowley SS	F2	1,452,000	290,400
	Cowley SS	F3	242,000	48,400
			1,694,000	338,800

Proposed BPM Amendment 7 Access Road Disturbance by Area

Proposed Amendment 7 Access Road Disturbance

Black Gulch Access Road T55N R93W

	Center Line Length	Ride-of-way Width	Disturbance Width	Disturbance Area	Surface
Sec. 21	ft	ft	ft	Acre	Ownership
N1/2NE1/4 SW1/4	632.2	60. 0	30.0	0.44	BPM

G' Claims Access Road T56N R94W

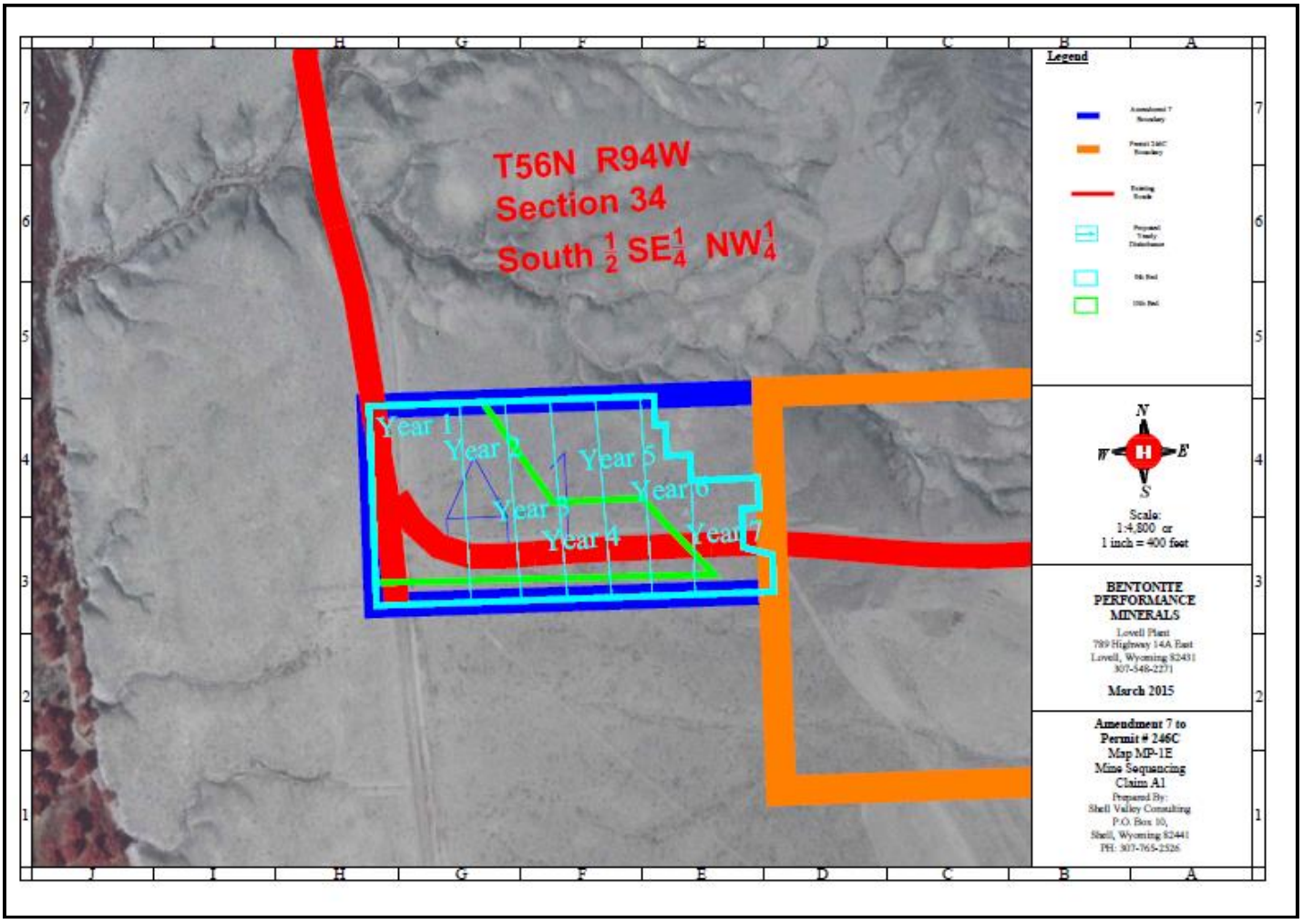
	Center Line Length	Ride-of-way Width	Disturbance Width	Disturbance Area	Surface
Sec. 25	ft	ft	ft	Acre	Ownership
NW1/4 SE1/4	435.56	60. 0	30.0	0.3	BLM

Carr Area Access Roads T58N R97W

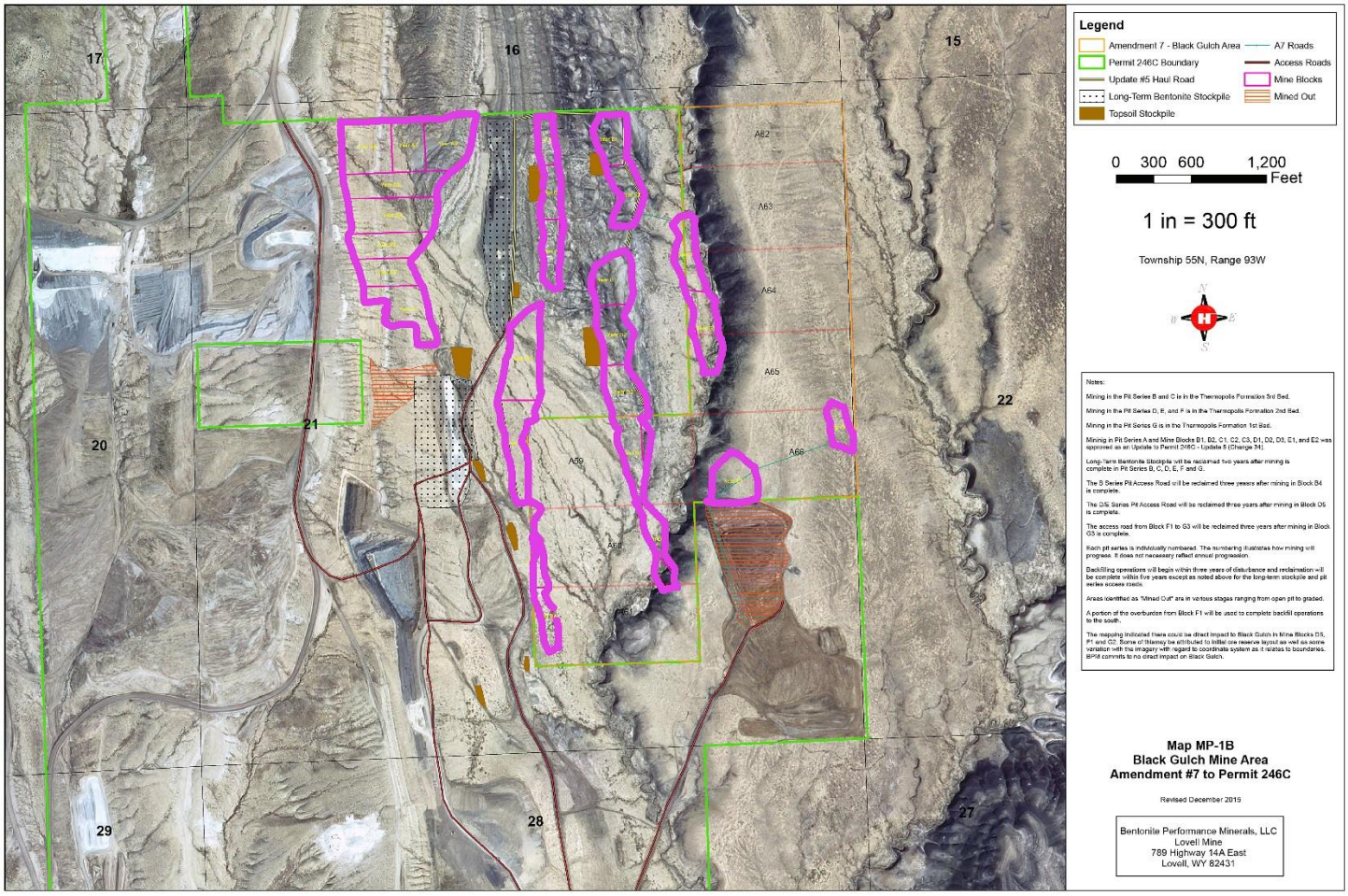
	Center Line Length	Ride-of-way Width	Disturbance Width	Disturbance Area	Surface
Sec. 27	ft	ft	ft	Acre	Ownership
SE1/4 SE1/4	684.45	60. 0	30.0	0.47	Lee Carr
SE1/4 NW1/4	925.21	60.0	30.0	0.64	Lee Carr
NW1/4 NW1/4	1102.81	60.0	30.0	0.76	Lee Carr

	Center Line Length	Ride-of-way Width	Disturbance Width	Disturbance Area	Surface
Sec. 21	ft	ft	ft	Acre	Ownership
S1/2 SE1/4	1159.07	60. 0	30.0	0.8	Lee Carr
S1/2NW1/4	820.42	60.0	30.0	0.57	Lee Carr

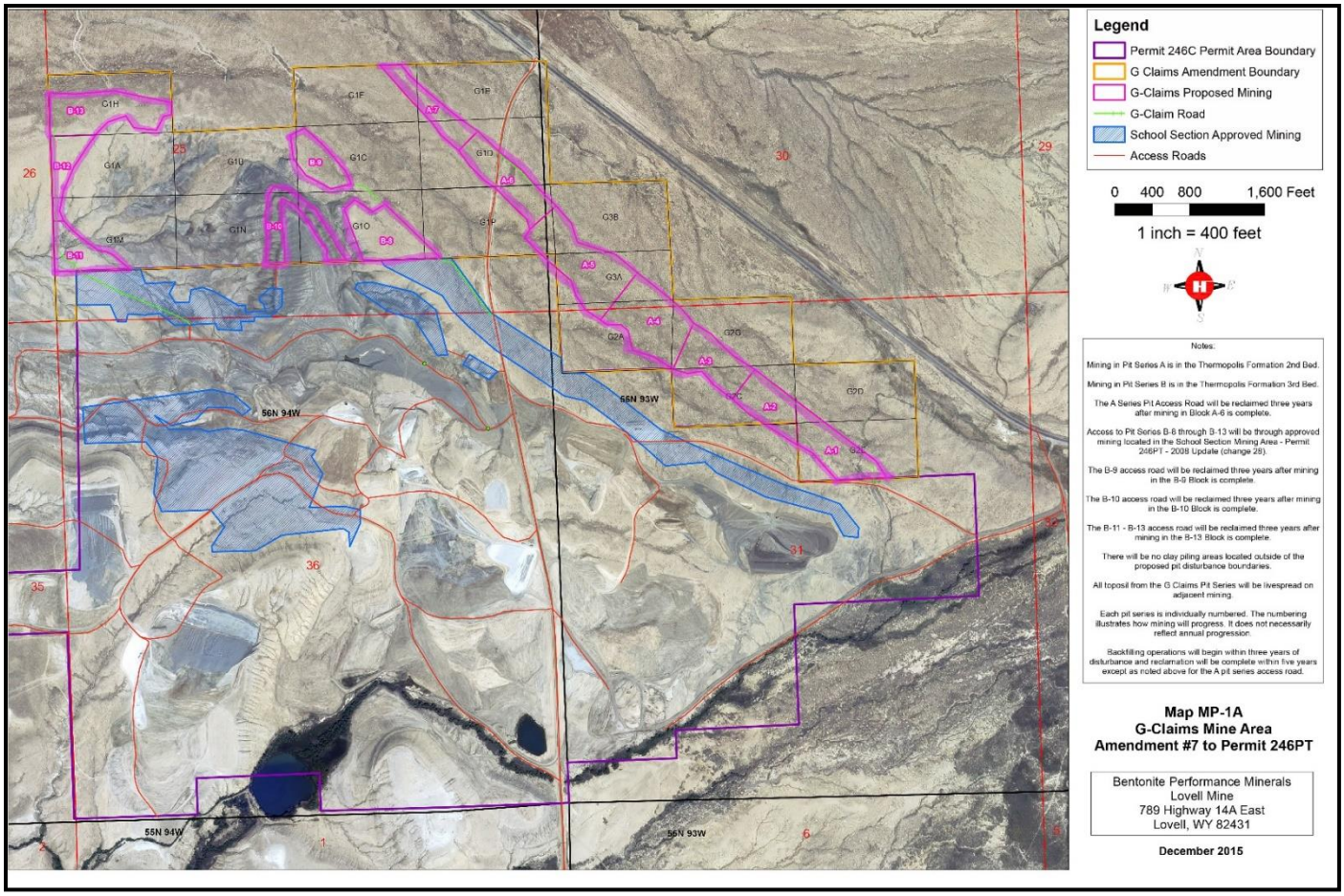
Appendix B
A-7 Plan of Operations
Detailed Mine Plan Maps



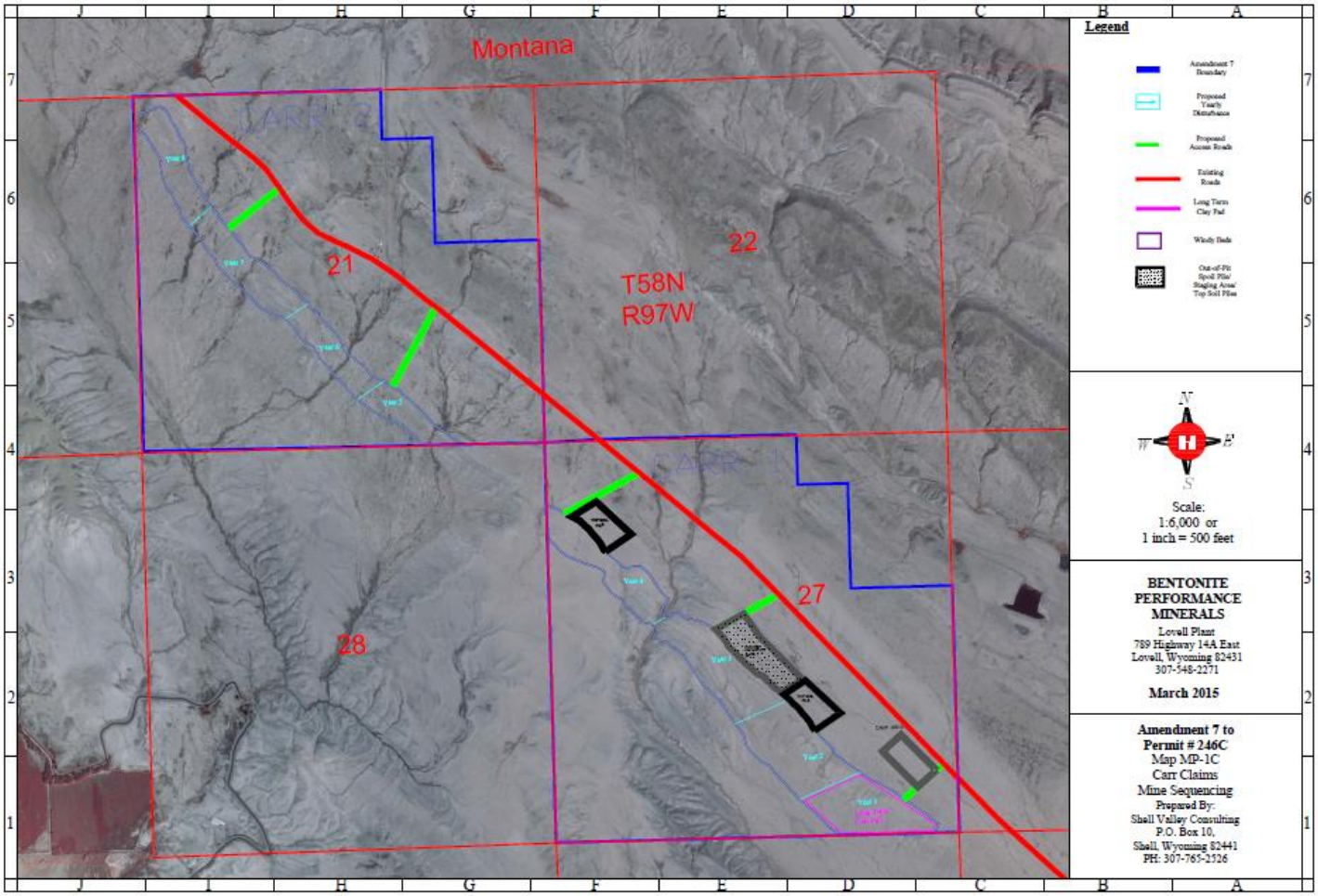
A-1 Claim Area – BPM Amendment 7 to Permit 246C: Section 34, T. 56 N., R. 94 W., 6th P.M., Big Horn County, WY. Areas proposed for mining and related disturbance on BLM land are outlined in blue and analyzed in this EA.



<u>Black Gulch Area Mine Plan</u> – BPM Amendment 7 to Permit 246C: Section 21, T. 55 N., R. 93 W., 6th P.M., Big Horn County, WY. Various land status throughout, areas proposed for mining and related disturbance are outlined in pink and analyzed in this EA.



<u>G-Claims Mine Area</u> – BPM Amendment 7 to Permit 246C: Section 25, T. 56 N., R. 94 W., and Sections 30-31, T. 56 N., R. 93 W., 6th P.M., Big Horn County, WY. Various land status throughout, areas proposed for mining and related disturbance are outlined in pink and analyzed in this EA.



<u>"Carr" Mine Area</u> – BPM Amendment 7 to Permit 246C: Sections 21 & 27, T. 58 N., R. 97 W., 6th P.M., Big Horn County, WY. All private lands proposed for mining and related disturbance are outlined in blue and not analyzed in this EA as no BLM land is involved.

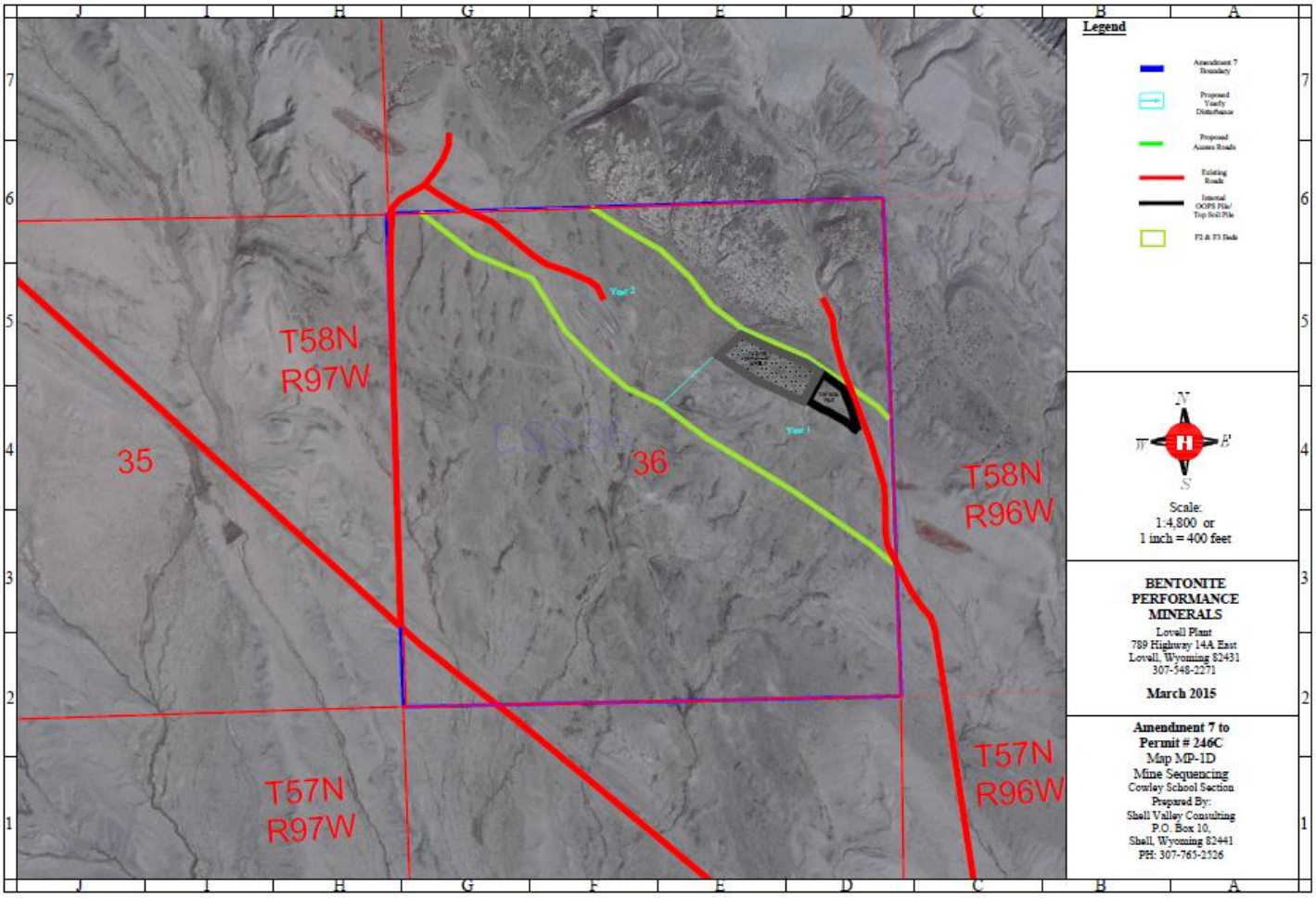


Figure 6. "School Section" Mine Area – BPM Amendment 7 to Permit 246C: Section 36, T. 58 N., R. 97 W., 6th P.M. Big Horn County, WY. All State of Wyoming lands proposed for mining and related disturbance are outlined in green and not analyzed in this EA.

Appendix C
A-7 Plan of Operations
Detailed Descriptions of the Mine and Reclamation Plans

MINE PLAN (Detailed)

BPM has submitted a complete Mine Plan for the A-7 Plan of Operations. A general description of this Mine Plan is provided in Chapter 2.0, with a detailed description provided in this appendix, which explains how BPM conducts its mining operations to prevent unnecessary and undue degradation of the public lands.

Mining Methods and Material Handling:

Bentonite is either: (1) Mined and hauled directly to the plant, (2) Ripped in place using a dozer or tractor equipped with a deep chisel to promote drying then load the bentonite on to haul trucks for delivery to the plant, and (3) Mined and stockpiled bentonite within a mined out section of the pit, ripping the stockpile regularly to promote drying, and once an optimum moisture level is reached (10% or less) load the bentonite on to haul trucks for delivery to the plant. In areas where the pit cannot provide sediment control (runoff protection from stockpiles) and/or where there is the potential of contamination of adjacent stockpiles of suitable material, berms would be constructed.

For the A-7 Plan of Operations, storage and stockpile sites would be temporarily constructed near active pits on an as needed basis within the disturbance boundary unless identified separately on mine plan maps. Topsoil would be live spread to the extent possible to allow for concurrent reclamation. Clay would be piled on existing clay pads/stockpiles or on field drying locations for the Black Gulch area on patented land. Clay from the G-Claims area would be hauled to the plant directly, or piled on the A1 claim. Clay from the A1 area would be stockpiled on the A1 disturbance footprint or hauled to the plant. The A1 disturbance footprint would be used as a long term clay-piling area to support mining operations in the 2012 Update West Area (approved previously). Reclamation of long term disturbance would take place within three years of completing mining in the Year 18 mining block of the 2012 Update West area.

BPM mines bentonite using the castback mining method. Each series begins with an initial pit that requires relocation of overburden to a stockpile or to a adjacent pit. Topsoil and subsoil from the initial pit is moved with scrapers and stockpiled adjacent to the pit series or live spread on adjacent mined areas. BPM and its contractors generally use dozers to rip the overburden and rubber-tired scrapers to separate and salvage topsoil and subsoil. Once the initial pit has been mined of clay the next pit is initiated and topsoil/subsoil are either stockpiled or live-spread. Overburden from the second pit is then cast back into the initial pit. Topsoil and subsoil from the third pit is then directly placed on previously contoured lands on the initial pit thereby completing the backfilling process. This process continues until the final pit has been mined, after which it is contoured into the surrounding topography to reestablish through-drainage using spoil backfill and highwall reduction if necessary. Stockpiled topsoil and subsoil are then replaced over the final pit in the series, and all topsoiled areas are reseeded.

The practice of castback mining eliminates the need for long-distance transport of backfill and cover material. It also decreases the disturbance footprint by reducing the amount of room needed for overburden and soil stockpiles. Castback mining is amenable to continuous reclamation efforts because it incorporates the practice of "live-spreading" rather than stockpiling topsoil. With "live" placement a source of microfauna and seed is available, thus, the potential for reclamation success is enhanced. When topsoil and subsoil are stockpiled for an extended period of time seeds and microfauna die, the amount of organic matter decreases, and other chemical and physical soil changes occur, degrading the topsoil's ability to support desirable vegetation.

Suitable overburden cap material is classified as either clean overburden or chemically suitable material. Clean overburden is any non-bentonitic overburden that exists near or at the surface and is not chemically suitable to be used as a topsoil replacement. In mine areas that do not have chemically suitable overburden available, BPM would salvage two feet of the upper overburden and stockpile it separately for reclamation. This material would be used as a cap over bentonitic overburden or for final cover in mine areas that are to remain barren postmine. Suitable material is any overburden that exists below the topsoil and subsoil that has been determined to be chemically suitable as a topsoil replacement. This material may be spread as a sub-cover beneath topsoil and/or subsoil or as a topsoil replacement where topsoil reserves are insufficient. When live placement of this material is not possible, the material will be stockpiled independently to ensure that it does not come into contact with any unsuitable or bentonitic material.

At the end of a pit sequence, if overburden is not available from another phase of mining, material needed to fill the last hole would be acquired by reducing the steep grade of a highwall through a "highwall reduction". A highwall reduction would be accomplished by removing topsoil and subsoil adjacent to the last phase and bulldozing the underlying material into the open hole of the last phase. After contouring the last phase, soil would be spread over the area using both material from the highwall reduction area and previous phases. The area of disturbance in the highwall reduction would be determined by the following three factors: the depth of the highwall of the last phase, the size of the phase, and the amount of swelling of overburden. In general, a tall highwall or a larger pit would require more disturbance in the highwall reduction area. If the overburden in the next-to-last phase has a high swell factor, more material would be available to fill the last pit in a series in turn minimizing the disturbance required for highwall reduction.
In general, BPM would decrease the size of its phases as they progress through the pit sequence so the last phases would be smaller than the first phases to reduce the potential disturbance from a highwall reduction.

BPM would salvage all topsoil and subsoil from affected lands including: (1) All pit areas and buffer zones around their perimeter; (2) All equipment parking and fueling areas, and (3) All out-of-pit-spoil areas. To minimize wind and water erosion and unnecessary compaction, stockpiles would be constructed with side slopes of 3:1 or flatter. New topsoil and subsoil stockpiles would be tilled and seeded with a temporary seed mix during the first available fall seeding period. In general, "A" soil horizons are salvaged as topsoil; "B" horizons and "C" horizons are salvaged as subsoil. Bedrock and overburden material are not salvaged with the subsoil. Topsoil salvage operations are supervised by the Stripping Supervisor. Salvage instructions would be taken from the soils information provided in the Plan of Operations and transferred to the pit diagram for the Stripping Supervisor. *When practical, BPM would leave mosaics of undisturbed lands between adjacent pit sequences, which would serve as a seed source for the reclamation and would act to slow water runoff and reduce erosion and sedimentation*.

Temporary hydrologic diversions would comply with WDEQ-LQD Noncoal rules, Chapter 3, Section 2(e)(ii)(F) to allow passage of peak runoff from a 2 year, 6 hour precipitation event in a non-erosive manner. Permanent diversions would comply with WDEQ-LQD Noncoal rules, Chapter 3, Section 2(e)(iv), in that they would have sufficient capacity for peak runoff from a 100 year, 6 hour precipitation event. *If necessary, sediment control fabric fences would be installed at discharge points into natural channels.*

If recontoured land awaiting final reclamation is present, BPM direct-hauls and redistributes subsoil and topsoil into their pre-mining vertical arrangement, mitigating the potential loss of top and subsoils. If recontoured lands are not available, this material is stockpiled near the area where it would be used during reclamation. The final pit in a series is typically reclaimed with subsoil and topsoil material from the initial pit or subsequent pits in the series. Topsoil and subsoil stockpiles are marked with signs reading TOPSOIL or SUBSOIL with lettering at least six (6) inches tall to aid in final pit reclamation.

Blasting Plans: BPM uses explosives to blast and loosen deeper overburden that cannot be ripped by dozers. Blasting areas located within BPM's mining claims between Highway 14A east of the Yellowtail Reservoir causeway are located throughout the area due to the various pit types being mined at any given time.
One man-made dwelling is located within one-half mile of the area covered under this of the permit in Section 21, T. 58 N., R. 97 W. on private land in the Carr area where no blasting is necessary.

Blasting would take place between sunrise to sunset, generally in the afternoon, and can occur any day of the seven-day week. Signs that state "Blasting Area" are posted at all public entrances that provide access to a blasting area. Areas in which loaded holes are awaiting firing are guarded against unauthorized entry. Signs are posted at all public entrances to the permit area from public roads or highways stating "*Warning! Explosives in Use*". An explanation of the use of sirens as a blast warning is provided. All personnel in adjacent areas at risk to injury from fly rock are removed before the blast is initiated.

All explosive agents are stored in one of two approved locations on BPM-patented land within the mine perimeter. Explosive powder (ANFO) is stored in a silo away from the locked magazines containing blasting caps. Non-explosive inventory is stored in a secured trailer at the same sites. All blasting agents received into inventory or depleted are recorded and updated within 24 hours by licensed blasters. Inventory records are kept at the storage site used by Specialized Blasting Services.
A siren is used for warning of an imminent blast, which is audible within a range of one-half mile from the point of the blast. All persons within the area notified of the meaning of the siren. Overburden is then loaded onto trucks and removed from the pit.

Out-of-Pit Spoil Piles: The A-7 Plan of Operations does not propose to construct any Out-of-Pit Spoil (OOPs) piles on federal lands although two such piles are planned, one on patented land and one on state land. OOPS Pile 1 is planned to be located on patented (private) land in Section 27, T. 58 N., R. 97 W., along a drainage divide and is surrounded by mining on one side. The graded pile would be blended into the surrounding reclamation. BPM would ensure the re-graded slope gradient is equal to or less than the maximum valley slope. The second OOPS is proposed to be located on State land in Section 36, T. 58 N., R. 96 W., within the proposed Year 1 disturbance line, adjacent to mining.

Haul Roads and Access: BPM would primarily use existing haul and access roads while mining under the A-7 Plan of Operations. BPM plans to disturb up to 0.3 acres in the G' Claims area for haul road construction. All other haul road disturbance proposed under this Plan would take place on private land. More information on proposed haul road disturbance and locations is provided in Appendix A. All haul roads and access roads would be constructed and maintained in accordance to the performance standards in the BLM Manual 9113, Wyoming BLM Manual 9113 Supplement, BLM Manual Handbook H-9113-1, and BLM Manual 9112. All haul roads, access roads and roads between pits are described in detail below.

Side slopes of haul roads within the A-7 area would generally be shaped to 3:1 or flatter to facilitate revegetation. If BPM needs a steeper side slope than 3:1 in any specific area, WDEQ-LQD's and BLM approval is be required. BPM would build embankment slopes for culvert crossings at a 2:1 slope. BPM would construct ditches that run adjacent and parallel with the roadway shoulder. The ditches will collect the runoff from the roadway and from adjacent upstream areas and direct it into surrounding drainages for downstream flow. Turnouts will be made where long sight distances exist from straight alignment and level road conditions occur. BPM utilizes three primary roadway erosion control structures including installation of culverts, a road base predominately of gravel to resist water erosion and lower dust from passing vehicles, and ditch turnouts, wherever possible, off the road into adjacent drainages. Ditch turnouts would be built often to promote adequate drainage. During monitoring special attention would be paid to small drainages that cross any of the roadways. Indications of accelerated erosion or head-cutting will necessitate installation of rip rap to slow water flows and reduce the sediment loading downstream.

RECLAMATION PLAN (Detailed)
BPM has submitted a complete Reclamation Plan for the A-7 Plan of Operations. A general description of this reclamation plan is provided in Chapter 2.0, and a detailed description is provided in this appendix.

Slope restoration: BPM would replace the topography to an approximate original contour after mining is complete. This would be achieved with slope distribution and blending practices. In general the steepest slopes that would be constructed would be 4:1 except where a 3:1 is needed for blending with adjacent native slopes. Highwall reduction would not be the primary means of contouring the last pit in a sequence. Spoil would be moved into the final pit sequence to achieve Approximate Original Contour. If all spoil is returned to the pit and further sloping is needed, 3:1 slopes would be constructed to reduce any remaining highwall. BPM would ensure that reclaimed slopes blend with surrounding native and reclaimed lands. BPM would also ensure that slopes support post-mining land uses and are stable.

Drainage restoration: No permanent impoundments would be constructed on public lands proposed to be mined under the A-7 Plan. All backfilling, grading and contouring operations would replace existing drainage patterns and create drainage on all reclaimed lands. Restored drainage patterns would be adequate to prevent excessive erosion or stream and watershed instability. This includes sinuosity, slope and channel hydraulic geometry. Drainages would be restored to erosion resistant contours with stream bank and channel geometry that is at least as stable as the pre-mine conditions.

A generic concave stream channel design would be used for minor channels and swales within small watersheds. Larger channels, topography, and contouring would generally be constructed with rubber tired scrapers and dozers. Channels would generally be constructed with large concave or trapezoidal bottoms that average between 10 and 12 feet in width. Pilot channels would most likely develop within reclaimed channels. Pilot channels should exhibit geometry, profiles, and sinuosity's that are similar to native channels. Comparable to native channels, the pilot channels should develop incised characteristics with bottom widths of one to four feet. Natural meanders would also develop.

Reclaimed channels would be built with similar sinuosity and stream gradient as the original channel. Premine stream gradients have been mapped and provided in the A-7 Plan as longitudinal profiles. Premine data would be used to establish maximum gradients during reclamation to help ensure stability. Erosion-resistant material such as large rock and boulders would be placed in the channel, on stream banks, in areas of changing gradients or obvious areas of potential accelerated erosion when available. Channel density (linear feet of channel/square foot of watershed) would be restored as well. When removing culvert road crossings, fill material would be removed and channels restored to the approximate premine stream gradient, channel geometry, and bank slope characteristics as outlined in the Plan of Operations.

Where undisturbed channels enter restored channels transition zones would be constructed. Transition zones would encompass a minimum of 50 linear feet above and below where the channels join. Velocity and flow control structures such as rip rap, straw bales or waddles, and sediment bars may be constructed within transition zones to dampen hydraulic problems. Contouring would be accomplished so constructed channels match channel geometry and bank slope of the natural channel. At the transition zones, substantial breaks in slope may be unavoidable and at these locations, grade control structures may be built using appropriately sized, angular rock. They must also be designed with the proper footing and keys.

If gradients are too steep and resources are not available to construct properly designed grade control structures then the channel may be constructed with more meanders and a higher sinuosity to reduce velocities and erosive forces. In addition, rock and boulder rip-rap may be placed into the outside of bends to prevent accelerated erosion of the channel during high flow events.

If sufficient rock is not available, bends can be constructed with shallower radii reducing the chances for flows to undercut banks. These reclamation efforts will restore the mined area to stable channel characteristics and similar water and sediment discharge patterns.

Wetland restoration: BPM states that no jurisdictional wetlands would be disturbed on public lands as a result of mining under the Amendment 7 Plan of Operations.

Replacement of Topsoil, Subsoil, Suitable Material, and Rock: BPM uses dump trucks to replace rock and overburden to or from active mining pits or stockpiles. Bulldozers are then used to contour, grade, and shape this material, preparing it for finer overburden placement over the coarser material. Finer overburden is then removed from active mining pits or stockpiles and distributed evenly the area being reclaimed. Contouring, shaping, and grading are completed using scrapers. Contouring includes the development of channels, hill slopes, and draws, thereby restoring the mined area to similar premine topography. The finished grade would eliminate ridges and gullies.

BPM uses scrapers to replace all spoil cover material (clean overburden, suitable overburden, subsoil, and topsoil). Timing of replacement is dependent on the location of the operation within the pit series. For example, cover material salvaged during the early stages of pit series development will generally be stockpiled for future distribution. As mining progresses through a pit series, cover material would be direct hauled to a previously mined out, backfilled and contoured pit. Redistributed cover would be graded but always left in a roughened condition to protect it from wind and water erosion. All surfaces in final cover will be ripped along the contour with a ripping depth not to exceed two feet to prevent contamination from underlying material.

Whether an area was barren or vegetated prior to mining, BPM would cover contoured overburden and any bentonitic spoil with a minimum of two (2) feet of clean or chemically-suitable material to include topsoil and/or subsoil. Clean overburden would be used as cover material in post-mine areas designated as replacement for pre-mine barren lands. If opportunities arise during mining to salvage additional suitable cover material (e.g., subsoil and chemically suitable overburden) beyond what is required to meet revegetation commitments, the material would be salvaged and spread over lands that were naturally barren. Chemically suitable material would be used as partial or complete cover in areas that are revegetated post-mine.

Subsoil would be spread over chemically suitable material only. Dependent on the conditions present (e.g. topsoil availability) and the need to meet post-mine revegetation requirements, subsoil may be used as a base for topsoil or used as a topsoil substitute where topsoil availability is limited. Topsoil would be spread at a minimum depth of four inches, concentrating on areas that are most conducive to harvesting moisture (e.g., low spots, swales, and north and east facing slopes). Respread would be concentrated in these areas until the topsoil resource has been exhausted or the minimum replacement depth has been achieved. Where shortages of topsoil exist, BPM may elect to create mosaic patterns within the reclamation whereby there are pockets of topsoil respread surrounded by a final cover composed entirely of subsoil and/or suitable material. *In addition to ensuring that at least two feet of final cover is placed over the reclaimed surface, BPM may utilize rock as a reclamation component. Rock can assist reclamation by creating micro-topography that may ultimately establish wind breaks, reduce erosion potential or create conditions that are more favorable to some shrub species. Surface rock may also be stacked to create wildlife habitat.*

Postmine Sediment and Erosion Control: Sediment control during reclamation efforts would be provided by using a combination of Best Management Practices (BMP's). Following final contouring and topsoiling of a reclaimed area it would be ripped along contour which serves to reduce any compaction present as well as create furrows that will reduce runoff potential. In addition, BPM may elect to utilize weed-free mulch to assist in reduction of runoff potential and increase moisture retention. For reclaimed drainage channels straw bale check dams would be placed within the postmine drainage to serve as energy dissipaters/sediment filters. Straw bales used on federal lands must be certified weed-free.

One double set of dams would be placed at the lower boundary of the disturbance, with further check dams installed up-drainage if conditions warrant. These check dams will remain in the drainage until revegetation has been established.

If through time erosional features, such as head cuts, develop within a reclaimed channel BPM will implement one of several remediation measures, depending on the conditions present. These mitigation measures could include, but are not limited to: (1) armoring problematic channel reach with rock, (2) installation of rock check dams to reduce channel gradient, or (3) construction of a drop structure(s) using rock or gabion baskets that are keyed into the channel bed and banks.

Haul Road Restoration: Haul roads would be restored to pre-mine conditions after all mining and reclamation is concluded where applicable. This includes removal of fill, restoration and backfill of cuts, removal of culverts, and reconstruction and restoration of channels. If a road was present before mining operations and upgraded for mining purposes, the road would be reclaimed to its original state.

Reclamation Schedule: BPM would apply the schedule outlined in WDEQ-LQD Non-coal Chapter 13, Section 3 (a)(vi) for the timing of reclamation. Reclamation would begin within two years and be completed within four years of the date the land is first affected except where field drying is taking place, in which case reclamation would begin within three years and be completed within five years.
If delays to the committed schedule are anticipated, and dependent on the nature and extent of the delay, BPM would work with the WDEQ/LQD and BLM to resolve the issue with either a Chapter 7 revision or a request for Interim Mine Stabilization. Each Annual Report will clearly identify the status of all affected lands within the permit area using at least the following categories: (a) Open pit affected land, (b) Unreclaimed associated affected land, (c) Backfilled, graded and contoured land, (d) Subsoiled/topsoiled land, (e) Permanently seeded land, and (f) Full bond released land. Each Annual Report will clearly identify each new cut (proposed mining) in all pit sequences which will experience mining operations during the next (upcoming) Annual Report cycle.

Seeding: BPM uses two permanent seed mixes, both of which are provided in Table 4 below. BPM has proposed a mix of primarily native species, with the inclusion of Russian Wild Rye, a non-native species which has been approved by BLM in the past.

(Note: BLM will require the Russian Wild Rye be replaced with a similar native species such as Basin or Canada Wild Rye). BPM has also prepared a temporary use seed mix composed of grasses.

BPM would prepare the seedbed with either a pitter or a spring-tooth chisel plow. The seed box is mounted on the chisel plow or pitter, and set to release seed behind one of the implements. These techniques prepare the soil for seed, create a micro-topography advantageous to trapping soil and nutrients and improve the probability of seed germination and establishment. All seeding will be on the topographic contour unless safety considerations take precedence or perpendicular to the prevailing wind direction on very flat lands.

All permanent seeding will occur from October to November of each year or as long as the topsoil remains unfrozen. Generally, fall seeding allows maximum moisture retention and utilization of winter and spring precipitation.

If approved, BPM would use certified weed-free seed (per BLM policy IM-2006-073) and standard agricultural practices to minimize introduction of noxious weeds. BPM will consult with appropriate federal (BLM), county, and state agencies when other weed control methods, for example spraying, are appropriate to control localized weed infestations on stockpiles or revegetated lands. BPM would continue these practices until the reclaimed lands are fully released from the reclamation performance bond. BPM would seed subsoil and topsoil stockpiles with Seed Mix No. 1 described below if the stockpiles would not be respread within 6

months. In addition, BPM would seed haul road cut and fill slopes using broadcast methods if they are 3 to 1 or flatter, with a mixture comprised of only the perennial grasses listed in seed mix number 1. BPM does not propose irrigation of any reclaimed or revegetated A- 7 lands.

Protection of Reclamation Efforts: BPM would protect young vegetative growth from being destroyed by livestock until the vegetation is capable of renewing itself. BPM would employ some combination of grazing deferral, controlled grazing and/or fencing based upon agreement with respective surface owners (and/or public land livestock grazing permittees/lessees). BPM would also seek to coordinate domestic cattle grazing on revegetated lands so that the self-renewing capacity of the revegetation is not negatively impacted. Based upon agreements with respective surface owners, *BPM may selectively fence reclaimed lands to control the pattern and duration of domestic cattle grazing. Fences would be removed after bond release unless the surface owner requests that they remain and agree to maintenance in writing.*

Habitat Restoration Plan for Sagebrush Vegetation Communities: The A-7 Plan area includes important wildlife habitat such as sagebrush, therefore, BPM would prioritize the reestablishment of sage lands as part of post-mine reclamation. Specific to re-establishment of Big Sagebrush, BPM may choose to experiment with other known sagebrush species that could be accepted as either a substitute or an addition to Basin Big Sagebrush. BPM would commit to selective seeding the Shrub (Sagebrush) Mix No. 2 on one acre per every 20 acres of disturbed land that was identified, pre-mine, as Mixed Desert Shrub (MDS; which equates to approximately 9.5 acres). To maximize the potential for success, every attempt would be made to select seeding areas with a reduced exposure to wind and with the potential to trap moisture. Prior to seeding the Shrub Mix, BPM would either avoid the target areas with the Standard Mix, or would seed all areas with the Standard Mix, and then chemically treat the areas after the immediate growing season and prior to seeding the Shrub Mix. While the latter technique would put the sage seeding a year behind the general seeding, it may be a preferable alternative for seeding smaller plots where there is concern of broadcast seed drift from the Standard Mix.

In addition to sagebrush seed, the Shrub Mix consists of select forbs, shrubs, and grasses that would be less likely to out-compete the sagebrush. The presence of non-sagebrush species in the Shrub Mix not only enhances the habitat value of the mix, but also provides weed and erosion control in the form of ground cover. Specific to re-establishment of sagebrush, BPM may at some point choose to experiment with other known full-shrub sagebrush species that could be accepted as either a substitute, or an addition to sagebrush. Examples of non-Big Sagebrush species that could be added to the *sagebrush mix* include:

(1) **Other full shrubs** (four-wing saltbush and spiny hopsage);
(2) **Sub-shrubs** (shadscale, winterfat, fringed sage, and dragon sagewort);
(3) **Grasses** (bluebunch wheatgrass, bottlebrush squirreltail, Indian ricegrass, prairie sand reed, Sandberg bluegrass, and basin wildrye); and
(4) **Forbs** (sweet vetch, globemallow, bee plant, evening primrose, basin daisy, and phlox).

In cases where the plot-seeding of sagebrush does not result in visible sagebrush germination and persistence, other application techniques may be utilized to mitigate lack of response. These mitigation measures may utilize one or more of several promising techniques, including (1) Reseeding with Zeba® treated seed, (2) Irrigated bare root transplants, (3) Water enhancing products [Rainbird® gel packs or Zeba® granular application(s)], (4) Supplemental watering efforts, (5) Soil amendments, or (6) Any other technique identified by research or practice as a likely means to increase sagebrush establishment success.

Specific to the bond release process in this type of vegetative community, BPM and the WDEQ/LQD agree generally that "Sagebrush Enhancement Areas" are not to be evaluated independently of the parent MDS vegetation community type.

Rather, the enhancement areas would be lumped in with the other MDS community for purposes of quantitative vegetative sampling. The eventual Bond Release request would include a map that illustrates locations of these "Sagebrush Enhancement Area(s)".

BPM has proposed in their reclamation plan that "…*bond release would be granted provided that perennial vegetative cover of the entire bond release community type is equal or greater than its native counterpart".* However, BPM (and WDEQ-LQD and BLM) understands it is important to establish which techniques and species provide the best chance for reclamation success and, thus, will provide a qualitative evaluation of the "Sagebrush Enhancement Area" reclamation success.

Methods for the evaluation of reclamation success (generally): Reclamation success is based upon restoring landscapes to the approximate original contour and vegetative community in a stable, non-erosive manner and restore the postmine land uses of grazing and wildlife habitat. BPM acknowledges bond release may only be approved when reclamation demonstrates that vegetation cover is equal to or greater than a similar native parcel, and be as hydraulically stable as pre-mine conditions. Revegetation would be reestablished and provide sufficient cover to prevent erosion. Bond release procedure to determine revegetation success would utilize the "Extended Reference Area" for comparison analysis. Vegetation transects on adjacent undisturbed lands for each affected vegetation map unit will be sampled for perennial species cover and species diversity. A minimum of 20 transects and a maximum of 50 would be sampled for each affected plant community map unit. Adequate sample size would be calculated using sample adequacy calculations outlined in Appendix D8 and LQD Guideline 2. Establishment of suitable vegetation and wildlife habitat will be evaluated through vegetation and wildlife monitoring described in Appendices D8 and D9.

Appendix D.
Climate and Air Quality Data

CLIMATE: Climate of the A-7 Plan area is typical of cold desert regions of the inter-mountain west. The A-7 Plan area falls under normal conditions, in a 5 to 9-inch precipitation zone. However, the entire Bighorn Basin has been experiencing a severe drought since 1999 with precipitation rates generally much lower than average (NCDC, 2011). Outside of drought conditions, climate in this area was typical of cold desert regions of the inter-mountain west, with long, cold winters; hot, dry summers and moderate to high winds.

Average maximum temperatures for the A-7 Plan area are during the months of June, July and August as expected, and average minimum temperatures are during the months of December, January and February. Between 1897 and 2016, the mean average annual high temperature in the area was 59.0˚F, and the mean average annual low temperature is 30.1˚F (see the table below). Average total precipitation for the area is 6.64 inches/year with most of this precipitation falling during the months of May and June. This area has average annual precipitation of 5 to 9 inches, approximately 80% of which falls between April and October. The remainder falls during the months of December through February in the form of snow and/or rain. The growing season for cool season species is approximately April 15 to June 30.

The following table provides a summary of climatic data for Lovell, Wyoming from 1897 to 2016 as recorded by the Lovell, Wyoming HPRCC station (2011):

LOVELL, WYOMING (485770)
Period of Record Monthly Climate Summary
Period of Record: 04/01/1897 to 05/31/2016

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	29.6	36.7	47.6	59.2	69.1	78.9	88.3	85.9	74.0	61.1	44.8	33.0	**59.0**
Average Min. Temperature (F)	4.6	10.9	20.7	30.8	41.0	49.0	54.3	51.1	40.8	30.6	18.9	8.4	**30.1**
Average Total Precipitation (in.)	0.29	0.21	0.33	0.63	1.16	1.13	0.62	0.48	0.70	0.58	0.28	0.24	**6.64**
Average Total Snow Fall (in.)	4.1	2.4	2.5	1.2	0.2	0.0	0.0	0.0	0.4	0.7	1.7	3.8	**17.1**
Average Snow Depth (in.)	2	1	0	0	0	0	0	0	0	0	0	1	**0**

Percent of possible observations for period of record.
Max. Temp.: 98.5% Min. Temp.: 98.6% Precipitation: 98.2% Snowfall: 91.8% Snow Depth: 82.6%
Check Station Metadata or Metadata graphics for more detail about data completeness.

Source:
http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?wy5770

Air Quality Indicators

Wyoming Ambient Air Quality Standards (WAAQS) and National Ambient Air Quality Standards (NAAQS) identify maximum limits for concentrations of criteria air pollutants at all locations to which the public has access. The WAAQS and NAAQS are legally enforceable standards. Concentrations above the WAAQS and NAAQS represent a risk to human health that, by law, require public safeguards to be implemented.

State standards must be at least as protective of human health as federal standards, and may be more restrictive than federal standards, as allowed by the Clean Air Act. The Wyoming Prevention of Significant Deterioration (PSD) program establishes allowable increases of a given pollutant for a particular area from specific sources. In Wyoming, it is the responsibility of Wyoming Department of Environmental Quality (DEQ) Air Quality Division, subject to United States Environmental Protection Agency (EPA) oversight, to ensure compliance with federal and state air quality standards; setting maximum allowable limits (NAAQS and WAAQS) for six criteria pollutants—CO (carbon monoxide), SO_2 (sulfur dioxide), NO_2 (nitrogen dioxide), O_3 (ozone) and particulate matter (PM_{10} and $PM_{2.5}$); and setting maximum allowable increases (PSD Increments) above legal baseline concentrations for three of these pollutants (SO2, NO2, and PM10) in Class I and Class II areas.

Criteria Air Pollutants

The EPA established air quality standards (NAAQS) for criteria pollutants. Criteria pollutants include CO, NO2, O3, PM10 and PM2.5, SO2, and lead (Pb). Air-pollutant concentrations greater than the NAAQS represent a risk to human health.

Hazardous Air Pollutants (HAPs)

There are a wide variety of HAPs, including benzene, toluene, ethylbenzene, xylene (also referred to as BTEX), N-hexane, and formaldehyde. There are no federal air quality standards for HAPs (there are exposure thresholds), but some states have established "significance thresholds" to evaluate human exposure for potential chronic inhalation illness and cancer risks.

Visibility

Visibility, also referred to as visual range, is a subjective measure of the distance that light or an object can clearly be seen by an observer. Light extinction is used as a measure of visibility and is calculated from the monitored components of fine particle mass (aerosols) and relative humidity. It is expressed in terms of deciviews, a measure for describing perceived changes in visibility. One deciview is defined as a change in visibility that is just perceptible to an average person, which is approximately a 10 percent change in light extinction. To estimate potential visibility impairment, monitored aerosol concentrations are used to reconstruct visibility conditions for each day monitored. The aerosol species include ammonium sulfate, ammonium nitrate, organic mass, elemental carbon, soil elements, and coarse mass. The daily values are then ranked from clearest to haziest and divided into three categories to indicate the mean visibility for all days (average), the 20 percent of days with the clearest visibility (20 percent clearest), and the 20 percent of days with the worst visibility (20 percent haziest). Visibility can also be defined by standard visual range (SVR) measured in miles, which is the farthest distance at which an observer can see a black object viewed against the sky above the horizon; the larger the SVR, the cleaner the air
.

Since 1980, the Interagency Monitoring of Protected Visual Environments (IMPROVE) network has measured visibility in national parks and wilderness areas. These are managed as high visual quality Class I and II areas under the federal visual resource management (VRM) program. There are six IMPROVE stations in Wyoming, including one in the Planning Area at the North Absaroka site and two adjacent to the Planning Area (in the BLM Buffalo Field Office planning area) at the Thunder Basin National Grasslands and Cloud Peak National Wilderness areas.

Atmospheric Deposition

Atmospheric deposition refers to processes in which air pollutants are removed from the atmosphere and deposited into terrestrial and aquatic ecosystems. Air pollutants can be deposited by precipitation (rain and snow) or the gravitational settling of gaseous pollutants on soil, water, and vegetation. Much of the concern about deposition is due to secondary formation of acids and other compounds from emitted nitrogen and sulfur species, such as oxides of nitrogen (NOx) and SO2, which can contribute to acidification of lakes, streams, and soils and affect other ecosystem characteristics, including nutrient cycling and biological diversity.

Substances deposited include:

- Acids, such as sulfuric (H2SO4) and nitric (HNO3), sometimes referred to as acid rain.
- Air toxics, such as pesticides, herbicides, and volatile organic compounds (VOC).
- Heavy metals, such as mercury.
- Nutrients, such as nitrates (NO3-) and ammonium (NH4+).

The accurate measurement of atmospheric deposition is complicated by contributions to deposition by several components rain, snow, cloud water, particle settling, and gaseous pollutants. Deposition varies with precipitation and other meteorological variables (e.g., temperature, humidity, winds, and atmospheric stability), which in turn, vary with elevation and time.

Monitoring of Air Quality, Visibility, and Deposition in the Planning Area

Although various state and federal agencies monitor air pollutant concentrations, visibility, and atmospheric deposition throughout Wyoming, at present there are only a few air quality monitors in and near the Planning Area. Table 3-1 lists the available air quality monitoring sites in the Bighorn Basin and relevant sites nearby. The Wyoming DEQ Air Quality Division operates a PM10 and PM2.5 monitor as part of the State and Local Air Monitoring Site (SLAMS) network in Cody, Wyoming (Park County).

Additional SLAMS and Special Purpose Monitoring (SPM) sites operate in nearby counties. These include several IMPROVE monitors and BLM-administered sites that are part of the Wyoming Air Resource Monitoring System (WARMS). The "Basin" WARMS site, located northwest of Worland, has only been operating since 2010 and has a limited data record available. This site was recently upgraded to a full Clean Air Status and Trends Network (CASTNet) site in 2012, but although deposition and SO2 data are collected at this monitor, only ozone data were available for the analysis presented below. Atmospheric deposition (wet) measurements of NH4, sulfate (SO4), and various metals are taken at the Sinks Canyon site, which the BLM operates as part of the National Atmospheric Deposition Program (NADP), as well as the South Pass and Yellowstone Park sites. Figure 3-1 presents a map of northwestern Wyoming and parts of Montana and Utah that includes an outline of the Planning Area, the locations of Class I and II areas, and the locations of the various air quality and meteorological monitors discussed in this analysis.

With only one long-term air quality monitor (Cody – measuring PM10 and PM2.5), one relatively new monitor (Basin – measuring ozone, NO3-, ammonium, nitric acid, sulfate, and SO2) within the Planning Area, and one monitor (North Absaroka/IMPROVE) located just outside the Planning Area, it is difficult to accurately assess existing air quality conditions throughout the area. However, as noted above, air quality, visibility, and atmospheric deposition are monitored throughout Wyoming, including adjacent planning areas. Therefore, the BLM assessed recent air quality conditions in the Bighorn Basin by examining data collected at the Cody and Basin monitors, supplemented by various monitors in neighboring planning areas, as summarized in Table 3-1. While there are limited ambient air quality monitoring data available in the study area, air quality is generally considered to be good, with no regions in the Planning Area designated as non-attainment for NAAQS or WAAQS. Since the Planning Area is in attainment of NAAQS, a General Conformity Determination is not required. Based on measurements in the area, visibility in the Planning Area is considered excellent. It should be noted that the monitoring data presented in this analysis were selected from the available list of sites in nearby areas that would most closely match conditions in the Planning Area. For example, no data are presented for air quality monitoring sites located in the Upper Green River Basin (Sublette County), because, although some of these sites are closer to the Planning Area than other sites presented in the analysis, this area is located on the other side of the Wind River Range and has meteorological and emissions characteristics far different from those experienced in the Planning Area.

Trends

This section describes recent trends in air quality in the Planning Area by examining data collected at the Cody PM10 monitor and nearby North Absaroka IMPROVE site, and as best as can be inferred criteria pollutant (ozone), visibility, and deposition data collected at monitoring sites further outside the Bighorn Basin in adjacent areas. Because measurements of carbon monoxide (CO) are typically representative of local air quality and the Yellowstone monitor is the only site that measures CO near the Planning Area, the CO data presented in Table 3-3 may not be representative of conditions in the Planning Area.

Air Pollutant Concentrations

This section presents air quality data collected at the various monitors in and near the Planning Area (see Table 3-1) for PM10, PM2.5, O3, SO2, SO4, NO3, and NH4. There are currently no measurements of HAPs within the Planning Area. Figure 3-2 shows annual peak 24-hour average PM10 concentrations at the Cody site for 2000 through 2012. Over this period, peak 24-hour average measurements of PM10 were well below the NAAQS (150 micrograms per cubic meter [µg/m3]) and vary considerably from year to year. There is no real discernible trend during this period.

Ozone
10 Highest Daily Maximum 8-hour running averages
Basin
WARMS Network
01/01/2015 - 12/31/2015

Value	Date	Start and End Time of Daily Maximum 8-Hour Average	Daily Maximum 8-Hour Average (ppb)
1	05/02/2015	12 - 19	61
2	07/16/2015	10 - 17	61
3	08/21/2015	10 - 17	61
4	06/11/2015	12 - 19	59
5	07/26/2015	11 - 18	59
6	08/24/2015	12 - 19	59
7	06/03/2015	13 - 20	58
8	07/03/2015	11 - 18	58
9	07/04/2015	11 - 18	58
10	05/01/2015	11 - 18	57

0 Days this period with 8-hour averages > 70 ppb

PM2.5 E-BAM
10 Highest 24-Hour Averages
Basin
WARMS Network
01/01/2015 - 12/31/2015

Value	Date	Hour	Concentration (ug/m3 lc)
1	12/03/2015	00-23	22
2	09/14/2015	00-23	14
3	12/01/2015	00-23	14
4	12/02/2015	00-23	14
5	12/30/2015	00-23	14
6	12/05/2015	00-23	12
7	11/30/2015	00-23	11
8	12/04/2015	00-23	10
9	12/06/2015	00-23	10
10	12/09/2015	00-23	10

WARMS Network - Filter Pack Data
January 1, 2015 to December 31, 2015

Basin On Date	Off Date	p-SO4 (µg/m³)	p-NO3 (µg/m³)	p-NH4 (µg/m³)	HNO3 (µg/m³)	SO2 (µg/m³)	Total NO3 (µg/m³)	Ca (µg/m³)	Cl (µg/m³)	Mg (µg/m³)	Na (µg/m³)	K (µg/m³)	Vol (m³)	Valid Hours	Lab Codes/Comments
Average*		0.72	0.93	0.4	0.41	1.25	0.93	0.17	0.01	0.02	0.04	0.05			
StDev*		0.36	0.67	0.35	0.38	0.73	0.67	0.13	0.01	0.02	0.03	0.04			

Appendix E
BLM seed policy in IM-2006-073

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240
January 20, 2006

EMS TRANSMISSION 01/27/2006
Instruction Memorandum No. 2006-073
Expires: 09/30/2007

To: All Field Officials

From: Director

Subject: Weed-Free Seed Use on Lands Administered by the Bureau of Land Management

Program Area: All programs which place seed, or approve the placement of seed on public lands.
Purpose: This Instruction Memorandum (IM) describes Bureau of Land Management (BLM) policy for the quality of seed purchased by BLM for use on public lands.

Background: The BLM Manual Section 1745 (1992) establishes policy and guidance for transplantation, augmentation, and reestablishment of habitat on public land utilizing native, and when necessary, introduced plant species. This action will comply with all Federal and State regulations, restrictions, and requirements governing the release and distribution of non-native exotic plants, including weed seeds.

BLM's Partners Against Weeds – An Action Plan for the Bureau of Land Management, January 1996, outlines BLM's plan to prevent and control the spread of noxious and invasive weeds on BLM lands. In addition, the 1999 Executive Order No. 13112 on Invasive Species states that each Federal agency shall not authorize, fund, or carry out actions that are likely to cause or promote the introduction or spread of invasive species in the United States.

The BLM obtains/purchases native or introduced plant seed, from seed producers and collectors for stabilization, rehabilitation, or restoration of public land. Prior to BLM accepting seed from any source, all seed must be tested for noxious weed seed at official state seed analysis labs. Noxious weed seed is not allowed in certified seed according to individual State's Department of Agriculture seed law and the Federal Seed Act. It has been acceptable for the seed lot (excluding species on the State and Federal noxious weed seed list) to contain from 0.5 percent to 2.0 percent of other "weed" seed depending on the State. "Other weed seed" is defined as any non-noxious weed seed, such as cheatgrass (downy brome) or Russian thistle, in the State(s) of concern. When purchased, all seed must also be of certified quality or source-identified.

Policy/Action: All Field Offices are required to use seed on public lands that contain no noxious weed seed and meets certified seed quality. All seed to be applied on public land must have a valid seed test, within one year of the acceptance date, from a seed analysis lab by a registered seed analyst (Association of Official Seed Analysts). The seed lab results shall show no more than 0.5 percent by weight of other weed seeds; and the seed lot shall contain no noxious, prohibited, or restricted weed seeds according to State seed laws in the respective State(s). The seed procured for use on public land will meet the Federal Seed Act criteria. Seed may contain up to 2.0 percent of "other crop seed" by weight which includes the seed of other agronomic crops and native plants; however, a lower percent of other crop seed is recommended. Copies of the seed lab test results, including purity and germination (viability) rate, must be forwarded to the appropriate BLM office prior to seed application. If the seed does not meet the BLM and State/Federal standard for noxious weed seed content or other crop seed allowances, it shall not be applied to public land. All seed test results must be retained in the seeding project file.

The BLM State contracts for seed may be more restrictive with "other weed seeds" of concern as deemed necessary.

All donated seed or seed used for "mitigation or restoration" by contractors per a reclamation plan must meet BLM's noxious weed seed policy prior to use on public lands.

An exemption will be allowed for small reclamation projects, less than 20 acres or not to exceed 200 pounds of seed, which have an approved BLM reclamation or rehabilitation plan or permit.

The seed will be accepted if accompanied by an official seed analysis report that provides documentation to show no noxious weed seed per State(s) weed law and no more than 0.5% other weed seeds. For this exception, any one of three seed test documents will be accepted:

1. A certified "blue" tag or tags.
2. An independent seed lab test.
3. A seed lab analysis supplied by a vendor either by seed lot or by seed mix.

Straw or mulches applied as part of seeding, stabilization, rehabilitation, or restoration projects on public lands must be certified to be weed seed-free.

Timeframe: Effective immediately.
Budget Impact: Approximately 80% of the seed used on public lands is purchased during a National Seed Buy (three times a year average) via a national seed contract. Under this contract, the seed must be tested prior to acceptance and payment. Therefore, there will be no new costs associated with the National Seed Buy. For offices and programs not currently testing their seed for noxious weeds or are approving project proponents to apply seed on public land without first testing for noxious weeds there will be a slight increase in the cost of seeding treatments. A typical seed test costs between $120-220 per lot for purity, germination, and noxious weed seed analysis.
Manual/Handbook Sections Affected: None.
Coordination: Coordination for this IM has been with WO-200, WO-220, WO-230, WO-270, WO-310, ID-930, BC-660.
Contact: If you have any questions on policy, please contact Jack Hamby, National ES&R Program Lead, at (202) 452-7747 or via email at Jack_Hamby@blm.gov. Questions pertaining to seed test, viability, seed lot tags, or weed seeds should be directed to Scott M. Lambert, National Seed Coordinator, Idaho State Office, at (208) 373-3894 or by e-mail Scott_Lambert@blm.gov.

Signed by:
Lawrence E. Benna
Acting, Director

Authenticated by:
Robert M. Williams
Policy and Records Group,WO-560

Appendix F
BPM A-7 Soils Information

Soil Map Units, Areas and Volumes for Black Gulch, G Claims and A-1 Claim areas (above) and Carr/Cowley School Section areas of A- 7 Plan of Operations (Nyhenhuis, 2009)

TABLE D7-3A Nyenhuis Report (Black Gulch, G' Claims, Claim A1) Soil Map Unit Acreage Summary

Map Unit No.	Map Unit Name	Total Area (acres)	Total Area (%)	Total Affected Area (acres)	Total Affected Area (%)	Topsoil Volume (cubic yds)	Subsoil Volume (cubic yds)
8	Mudray shaly loam, 2 to 12% slopes	144.98	27%	24.27	18%	14683	0
9	Saddle very gravelly loam, 2 to 18% slopes	8.62	2%	0.34	0%	455	455
11	Persayo, lithic – Chipeta – Rock Outcrop complex, 3 to 50% slopes	22.82	4%	0.86	1%	458	458
12	Apron Variant very gravelly sandy clay loam, 2 to 30% slopes	210.54	39%	82.38	63%	132906	132906
12AC	Apron Variant very gravelly sandy clay loam, 2 to 30% slopes	68.47	13%	12.25	9%	19763	19763
14	Chipeta gravelly clay, 2 to 30% slopes	1.76	0%	0.58	0%	351	309
RL	Reclaimed Land	0.17	0%	0.00	0%	0	0
DL	Disturbed Lands	6.43	1%	2.90	2%	0	0
SBO	Shale - Bentonite Outcrops	50.32	9%	6.87	5%	0	0
BL-SBO	Badlands - Shale – Bentonite Outcrops	24.04	4%	0.80	1%	0	0
Total		538.15	100%	131.25	100%	168617	153892

Note: All Access Roads acreages have been included

TABLE D7-3B SVC Report (Carr Area & Cowley SS) Soil Map Unit Acreage Summary

Map Unit No.	Map Unit Name	Total Area Mapped (acres)	Total Area (%)	Total Affected Area (acres)	Total Affected Area (%)	Topsoil Volume (cubic yds)	Subsoil Volume (cubic yds)
MU1	Sayles & others	126.89	11%	71.70	24%	28919	0
MU2	Stutzman & Persayo; <15% Apron inclustions	56.93	5%	7.39	3%	5961	17884
MU3	Greybull, Stutzman Taxadjunct	168.76	14%	28.30	10%	22829	22829
MU4	Greybull, Stutzman & 30% MU3 inclusions	89.20	8%	9.27	3%	7478	22433
MU5	Apron Variant very gravelly sandy clay loam, 2 to 30% slopes	33.92	3%	2.13	1%	1718	15464
MU5s	Sodic Lostwells	15.05	1%	3.25	1%	2622	23595
MU6	Torchlight	35.53	3%	8.01	3%	6461	32307
MU7	Mudray	5.63	0%	0.60	0%	484	0
OC-MU1	Barren Outcrop w/ <40% MU1 inclusion	34.14	3%	23.80	8%	3840	0
SS1	Oceanet	11.70	1%	1.65	1%	1331	3107
SS2	Apron	33.06	3%	23.88	8%	19263	173369
SS3	Kinnear	42.43	4%	2.76	1%	2226	11132
SS4	Uffens; 10% Sayles/Persayo inclusions	235.89	20%	51.68	18%	41689	41689
SS5	Lostwells	70.71	6%	3.54	1%	2856	25700
SS6	Sayles, Persayo Complex, 20% OC inclusions	90.18	8%	16.43	6%	6998	0
SS6s	Shallow Torriorthents	6.64	1%	6.64	2%	0	0
SS7	Unnaded Haplargid	2.52	0%	1.02	0%	823	7405
OC	Barren Clay/ Shale Outcrop	60.27	5%	1.62	1%	0	0
RL	Reclaimed Lands	24.81	2%	24.71	8%	23242	0
RO/TR	Sandstone Rock Outcrop/ Travessilla Complex	35.57	3%	0.00	0%	0	0
DL	Disturbed Land (Exsisting Roads)	5.78	0%	4.96	2%	0	0
Total		1185.61	100%	293.34	100%	178739	396913

Note: All Access Roads and Out of pit spoil piles acreages have been included

*Total disturbance acreages do not include 10 acres projected in the Carr Area that will be affected by topsoil stockpiles without topsoil salvage.