

ENVIRONMENTAL ASSESSMENT -- WY-010-EA09-55

Bentonite Mine Plan of Operation
WYW148811

Wyoming State Office -- Worland Field Office

July 2009



MISSION STATEMENT

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EA
for the Wyo-Ben Inc. Bentonite Mining Plan of Operation
WYW148811
Hot Springs County, Wyoming



United States Department of the Interior
Bureau of Land Management
Worland Field Office
P.O. Box 119
Worland, WY 82401



Environmental Assessment -- WY-010-EA09-55

Operator: Wyo-Ben Inc.

Type of Action: Surface Management Plan of Operation (43 CFR 3809.400)

Case serial number: WYW148811

Locations: T43N, R93W, Sec. 18 N2SENE, S2SENE, N2NESW, SWNENE, NESWNE, NWNWSE, and Sec. 19 SWNW, W2SENW, N2NWSW, NWNESW, S2NESE, NWNESE;
T43N, R96W, Sec. 24, SWSE and Sec. 25 E2SWNE, SWSENE, N2SENE, SWNENE, NWNE, NWSWNE;
T44N, R96W, Sec. 28, NWSWSW, S2SWNW, N2NWSW, SWNWSW; Sec. 29, N2SE, SWSE, S2SW; and Sec. 32 W2NWNW

Ownership: Surface: Federal
Minerals: Federal

Prepared by: Peter Sokolosky, *et al*
Date: July 2009

This EA incorporates the Proposed Mine Plan of Operations, and associated access, for the proposed action of mining for bentonite on unpatented placer mining claims pursuant to the Surface Management regulations at 43 CFR 3809. This plan of operation is assigned serial number WYW148811.

1.0 INTRODUCTION

1.1 Purpose and Need

This environmental assessment was prepared in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA) and other statutes relevant to the proposal. Authority for the proposed action and alternatives is contained in the Federal Land Policy and Management Act of 1976, as amended (FLPMA) and the regulations in 43 CFR 2200. Section 102(a)(8) of FLPMA states:

“the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use;”

This plan of operation would allow the operator the ability to mine and remove the minerals the operator has claimed pursuant to the location of placer mining claims. Subpart 3809 - Surface Management to Title 43 of the CFR requires the submission of a plan of operation when mining of so-called locatable minerals is proposed. The operator has submitted a proposal to mine in accordance with 43 CFR 3809.401.

1.2 Decisions to be Made

The Authorized Officer (AO) must determine whether 1) to approve the plan of operation as received, 2) to approve the plan subject to changes or conditions to meet the performance standards of 43 CFR 3809.420 and to prevent unnecessary or undue degradation; or 3) disapprove the plan because the proposed operations would result in unnecessary and undue degradation of the national system of public lands (see 43 CFR 3809.411(d)).

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

Finally, the AO must determine whether or not the proposed action could result in significant impact to the human environment. If not, this determination would be documented in a Finding of No Significant Impact (FONSI.) If the impacts could be significant, an environmental impact statement would be necessary.

1.3 Conformance with Land Use Plans

Name of Plan: Grass Creek Management Plan **Date Approved:** September 1998

Remarks:

This plan has been reviewed to determine if the proposed action conforms to the land use plan as required by 43 CFR 1610.5. The Grass Creek RMP provides that plans of operations are required for locatable minerals development consistent with regulations (43 CFR 3809), on lands open to the staking of mining claims and operation of the mining laws for locatable minerals. (Record of Decision and Approved Resource Management Plan for the Grass Creek Planning Area, pg 15.)

Name of Plan: Washakie Resource Management Plan **Date Approved:** September 1988

Remarks:

This plan has been reviewed to determine if the proposed action conforms to the land use plan as required by 43 CFR 1610.5. The Washakie RMP provides that all public lands not formally withdrawn or segregated from

mineral entry will be open for the exploration and development of locatable minerals..[and] the regulations listed in 43 CFR 3809 and agreements made with the state of Wyoming pursuant to those regulations will be applied to reduce unnecessary and undue degradation of resources as a result of mining (Record of Decision and Approved Resource Management Plan for the Washakie Resource Area, pg 12.)

All three alternatives would be in conformance with these plan decisions and objectives.

1.4 Scoping and Issues Identification

Scoping is an important part of the National Environmental Policy Act (NEPA) process and is used to determine the scope of issues to be addressed and for identifying the key issues related to a proposed action (40 CFR 1500.7). The scoping process can involve federal, state, and local government agencies, resource specialists, industry representatives, local interest groups, and members of the public. Scoping is an interdisciplinary process.

A plan of operation was received by the Worland Field Office November 8, 2008. In accordance with 43 CFR 3809.411 the plan was reviewed and additional information was requested in correspondence dated December 4, 2008. Additional information was received February 9, 2009 and soon after the plan was deemed complete. It was determined that the EA in the matter of the plan would be made available for a comment period for at least 30 days in accordance with 43 CFR 3809.411(c).

The following Worland Field Office personnel reviewed or have been contacted with regard to this EA and Record of Decision.

<u>Name</u>	<u>Title</u>
Mike Bies	Archaeologist
Marit Bovee	Archaeologist
Pete Sokolosky	Geologist
Marilyn Wegweiser	Geologist
Ted Igleheart	Wildlife Biologist
John Elliott	Range Management Specialist
Karen Hepp	T&E Plant Specialist / Range Management Specialists
Monica Goepferd	Civil Engineer
Carol Sheaff	Realty Specialist
Steve Kiracofe	Soil Scientist / Hazmat Specialist
Paul Rau	Outdoor Recreation Planner/VRM
Rance Neighbors	Noxious Weeds Coordinator

2.0 ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.1 Introduction

The proposed action involves the mining of bentonite at six proposed surface mining pit locations where Wyoben Inc., the operator, had located placer claim locations within Hot Springs County (see Figure 1) within the 6th Principle Meridian. There are existing dirt roads that the operator would maintain to BLM standards and in some cases upgrade that would be used as transportation routes for the mined product that would be hauled to a processing plant at Lucerne (general location of plant is shown on Figure 1). Table 1 presents information about each proposed pit area and the anticipated timing of operations thereon. The cast-back method of mining proposed is intended to promote the practice of concurrent reclamation and would minimize the size of disturbances at any particular time. This plan of operation has been assigned serial number WYW148811 which is on file with the Worland Field Office

Figure 1. General location of six proposed bentonite mine areas.

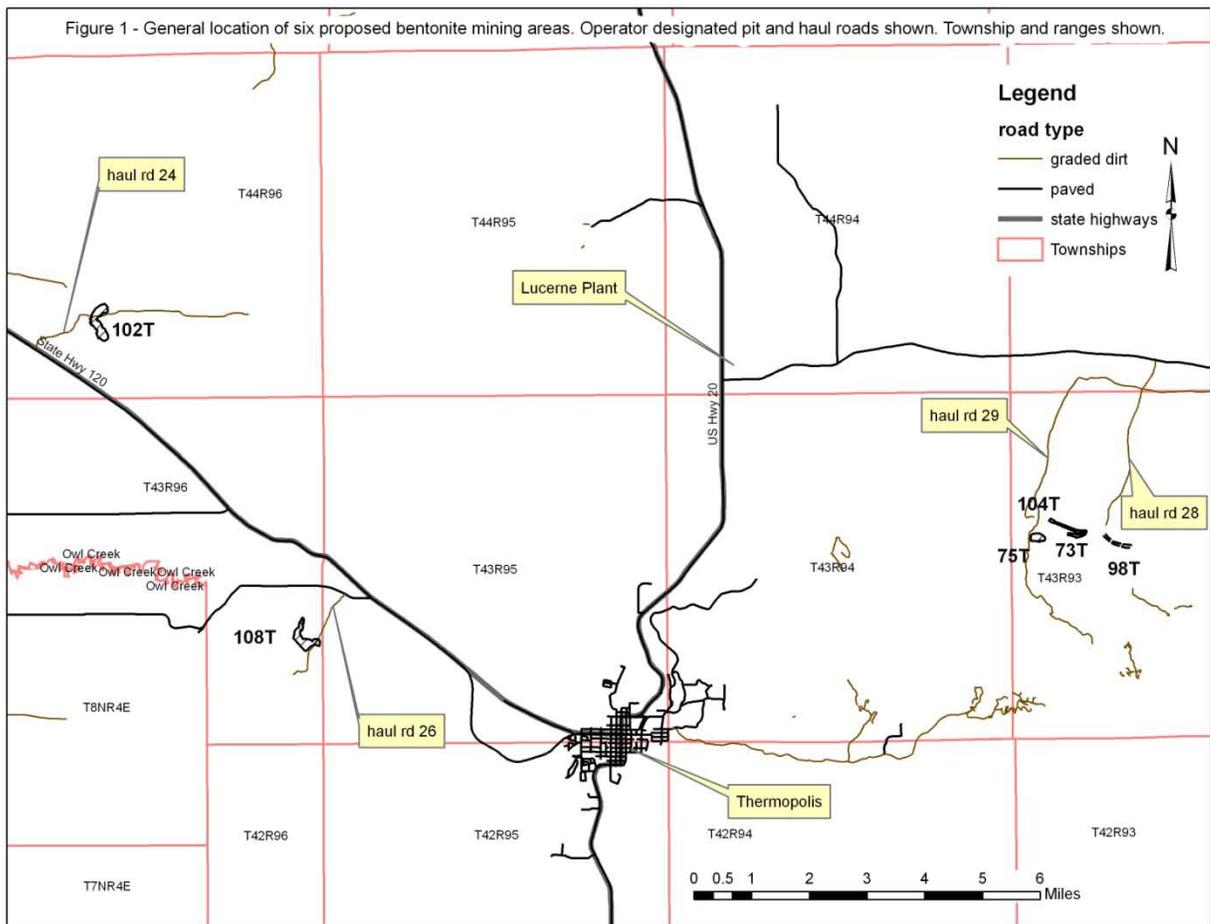


Table 1. Pit locations, projected mining dates, disturbances and operational days per year. The projected dates are only estimates and may change based on weather and market conditions.

PIT NUMBER/location	Projected Opening Date	Projected ending date	Pit Area + associated disturbances (access rd, stockpile area, etc)	Approximate disturbance/year	Operational days / year	Total Disturbance acres
73T / Sec. 17 T43N R93W	May 2010	2017	7.7 acres + 5.8 acres	2.0 acres	200	13.5 acres
75T / Sec. 18 T43N R93W	May 2009	2018	18.8 acres + 0.2 acres	2.4 acres	200	19.0 acres
98T / Sec. 17 T43N R93W	Sep. 2009	2017	16.0 acres + 2.5 acres	2.0 acres	200	18.5 acres
102T / Sec. 28 T44N R96W	Sep. 2009	2018	20.8 acres	2.0 acres	200	20.8 acres
104T / Sec's 17 & 18 T43N R93W	Oct. 2009	2018	19.3 acres	1.7 acres	200	19.3 acres
108T / Sec's 24 & 25 T43N R96W	Nov. 2009	2024	106.2 acres	6.5 acres	200	106.2 acres
GRAND TOTAL			197.3 acres	16.6 acres	--	197.3 acres

2.2 Alternative 1 (Proposed Action)

Plan of Operation as submitted.

2.2.1 Plan of Operation

The plan of operation is on file in the Worland Field Office Branch of Minerals and Lands, and is considered an integral part of this Environmental Assessment (EA) by reference. The contents of the submitted plan are in accordance with the content requirements cited in 43 CFR 3809.401. The operator is concurrently filing certain mine plan information with the Wyoming Dept. of Environmental Quality - Land Quality Division. There exists a Memorandum of Understanding for management of surface mining and exploration for locatable minerals between The BLM and the WYDEQ (MOU no. WY19, last supplemented Nov. 2003). The mining operations Wyo-Ben conducts within the Bighorn Basin are administratively tracked by DEQ-LQD as mine permit 321C.

2.2.1.1 Use of Existing Roads

No right-of-way action would be necessary for the proposed project. The operator would employ BLM road building standards found in the BLM Manual Section 9113 when constructing haul roads. Figure 2 shows typical cross sections of operator constructed haul roads in different topographic circumstances. Only three spur haul roads are proposed in this plan. Those include Haul road HR-29.1 which would cross a large drainage to access proposed pit 75T. Wyo-Ben is proposing a low water crossing in this case as the drainage is large, wide and fairly deep (> 4-feet). The other two proposed roads include HR 31.1 and 31.2, which would access proposed pit 98T. Other proposed pits would be accessed using previously constructed haul roads.

The operator would improve the six existing haul roads to access the six pits of the Amendment 6 Plan of Operations in the following manner:

- 1) If suitable growth medium exists on the roadway, it would be removed with scrapers and salvaged in existing soil stockpiles situated to the side of roadways (Haul roads HR-28.1 and 29 are two roads where suitable growth medium probably exists).

2) The roadway would be bladed, using a motor grader, to BLM standards including a crown towards the center of the road and a ditch on the edges of roads. Water drainages that allow water to drain from the road ditches into native lands would be placed in strategic locations along the edges of the roadway.

3) If Wyo-Ben improves two-track trails to haul road capability, it would be done in a similar manner as explained in 1 and 2 above. The only difference is that more growth medium would be available to save as explained in number 1 above; and new soil stockpiles would be situated to the side of roads.

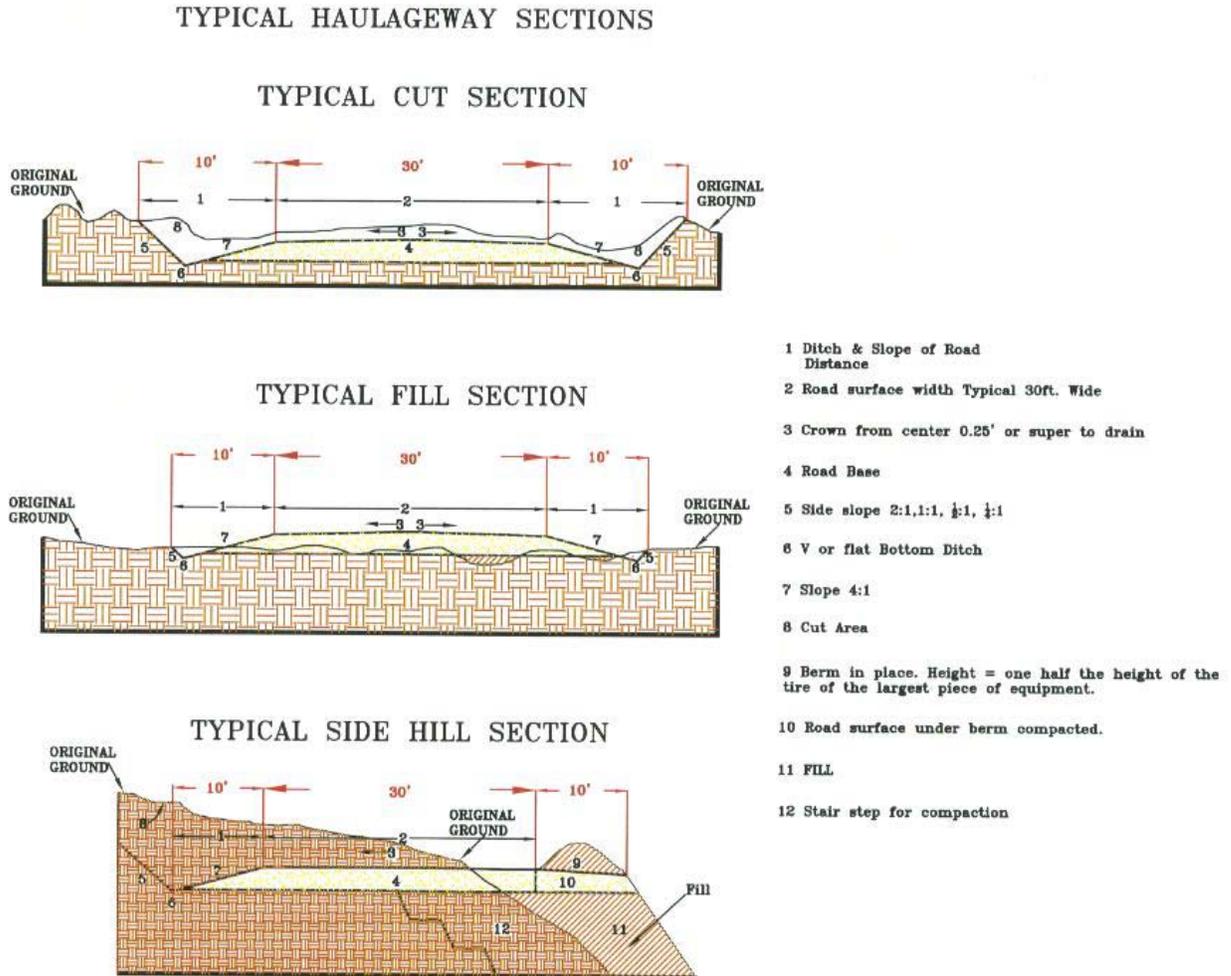
4) When the route of a haul road crosses a drainage then a culvert would be placed in that drainage with the size of the culvert based on the following size table

Culvert Sizing Table

FLOW (Cubic Feet Second)	Single Culvert Diameter (inches) 60 feet Long
9 cfs	18 - inch
18 cfs	24 - inch
31 cfs	30 - inch
49 cfs	36 - inch

There may be cases where the drainage being crossed lends itself better to a low water crossing than the installation of a culvert. In general, low water crossings would be implemented when the drainage is deep (\geq 4-feet deep) and wide with a flat bottom (In the case of this submission, haul road HR-29.1 is proposed as a low water crossing).

Figure 2. Typical Road Sections, extracted from operator's mine plan submittal.



Wyo-Ben, Inc, estimates the average number of hauling days per year to be 80 for all proposed pits of this Amendment/Plan of Operation. For each day bentonite would be hauled, it is estimated that haul trucks would make a combined average total of 28 round trips (4 trucks @ 7 round trips/truck).

Wyo-Ben's contractor uses a tractor trailer water truck system to water haul roads as a means of dust control. Typically roads that are being used for hauling are those that are watered when conditions dictate the need for such actions. The only time roads are less likely to be watered is during winter months when temperatures are below the water freezing point.

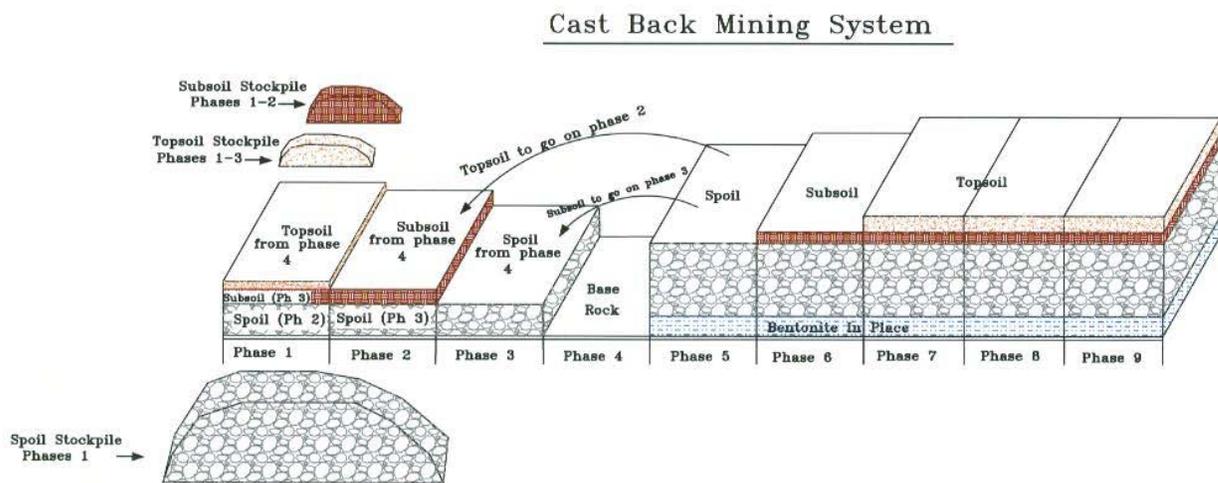
2.2.1.2 Mining Operations

The following is a general discussion of the proposed cast-back surface mining technique that would be used in the proposed action. Figure 3 shows a model of the cast back system. In this process, overburden from the first open pit (phase 1) of a pit sequence is usually stockpiled and contoured adjacent to the first open hole (sometimes referred to as an out-of-pit overburden pile). Top and subsoil are also stockpiled separately in the same general area. Once the bentonite is removed from phase 1, overburden (minus the topsoil and subsoil) from the next open pit of the sequence (phase 2) is cast into the open hole of phase 1. This process repeats itself until the end of the pit sequence. At this time, since there is not overburden available from another phase of mining, material to fill the last hole is

acquired by reducing the highwall's steep grade, also known as a highwall reduction. Highwall reduction would only be employed in the matter of the last phases of mining in pit 102T (see Figure 5 below). The campsites depicted on Figures 4, 5 and 6 are areas where equipment is parked when not in use. Campsites would then be moved onto contoured reclaimed areas as mining progresses. It is not anticipated that a campsite caretaker would be employed to protect equipment during times of non use.

The equipment that would be utilized in the movement of earthen materials at the pit locations would be wheel tractor-scrappers, track-type tractors (aka bull dozers), tracked excavators, motor graders, and wheeled front end loaders. During periods of operation equipment operators would commute to and from the mine on existing roads on a daily basis. The equipment would be parked within the so-called camp areas over night. Equipment service vehicles would occasionally be dispatched to the pit locations for the purpose of conducting on-site maintenance, repair and fueling operations.

Figure 3. Cast Back illustration extracted from operator's mine plan submittal.



The number of proposed phases for each pit area is as follows: 73T/ 2 phases, 75T/ 7 phases, 98T/ 5 phases, 102T/ 5 phases, 104T/ 5 phases, and 108T/ 11 phases. The phase blocks of each pit are shown in Figures 4 through 6.

Figure 4. Block phases for pits 73T, 75T, 98T and 104T. Not to scale. Excerpted from operator submitted plan of operation; these four areas with topography are displayed immediately below. Abbreviations BP – bentonite stockpiling area, TS – topsoil stockpile, SS – subsoil stockpile, SP – spoil [overburden-waste] stockpile, OB- overburden

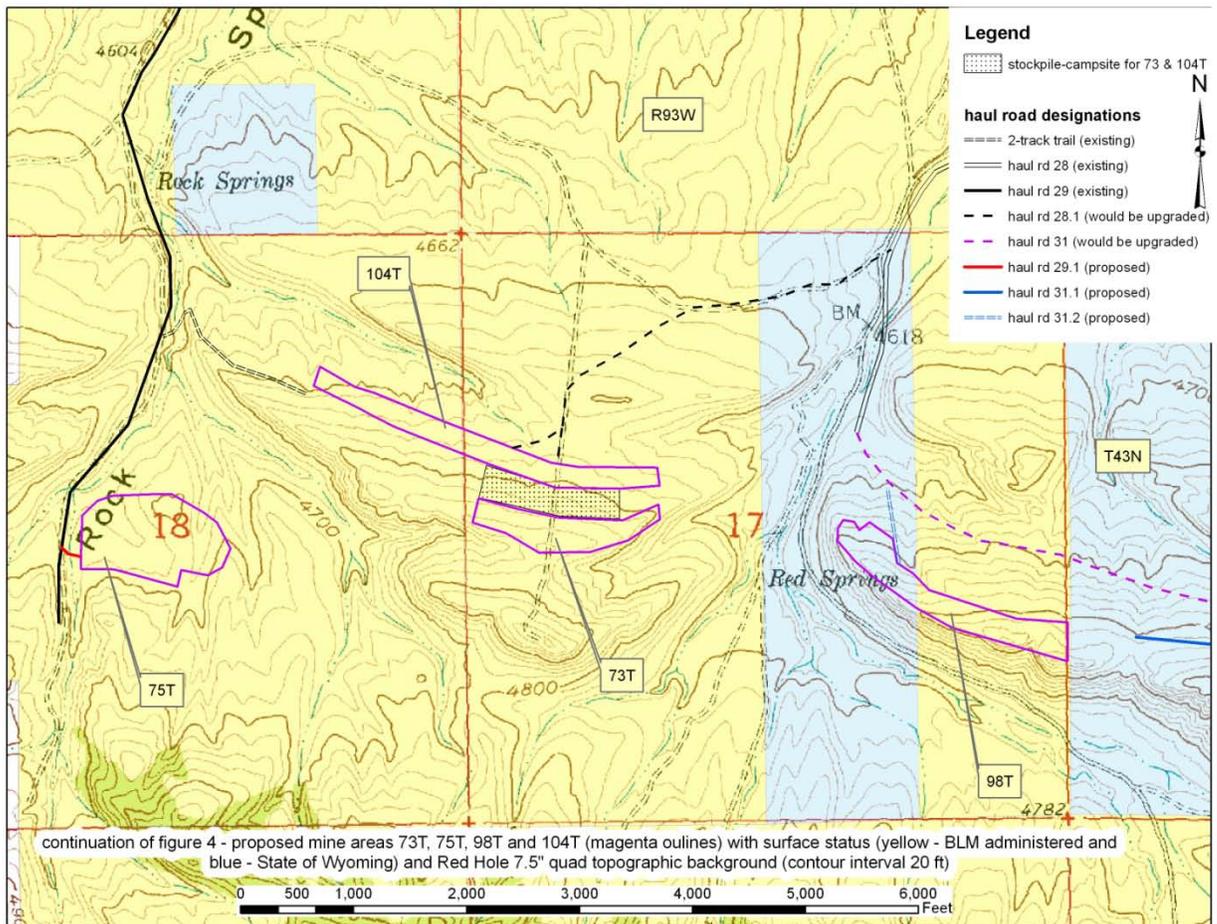
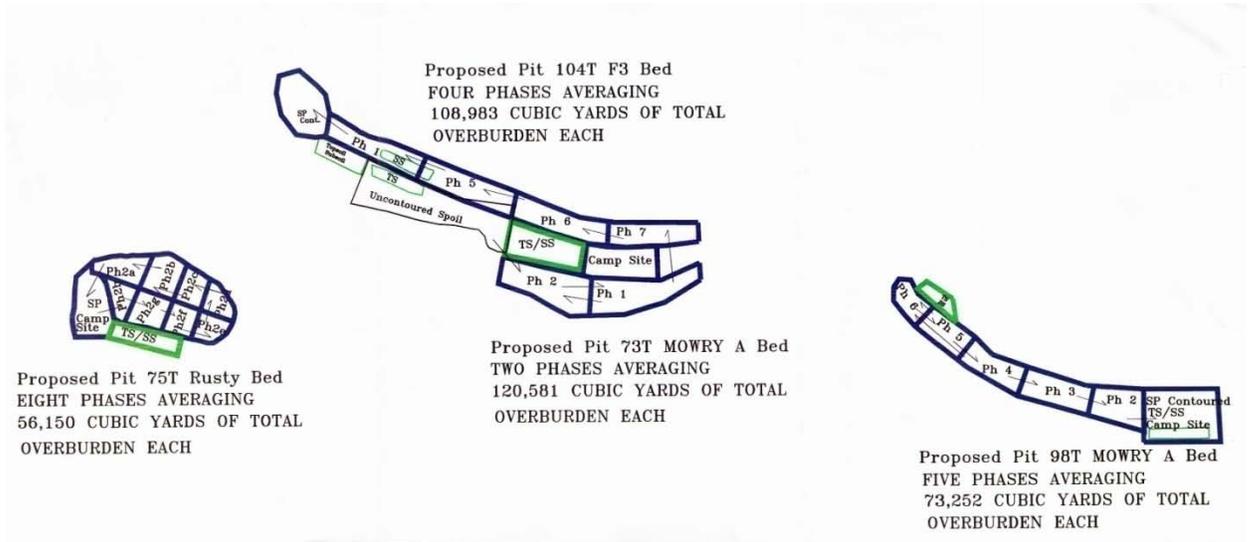


Figure 5. Block phases for pit 102T. Not to scale. Excerpted from operator submitted plan of operation

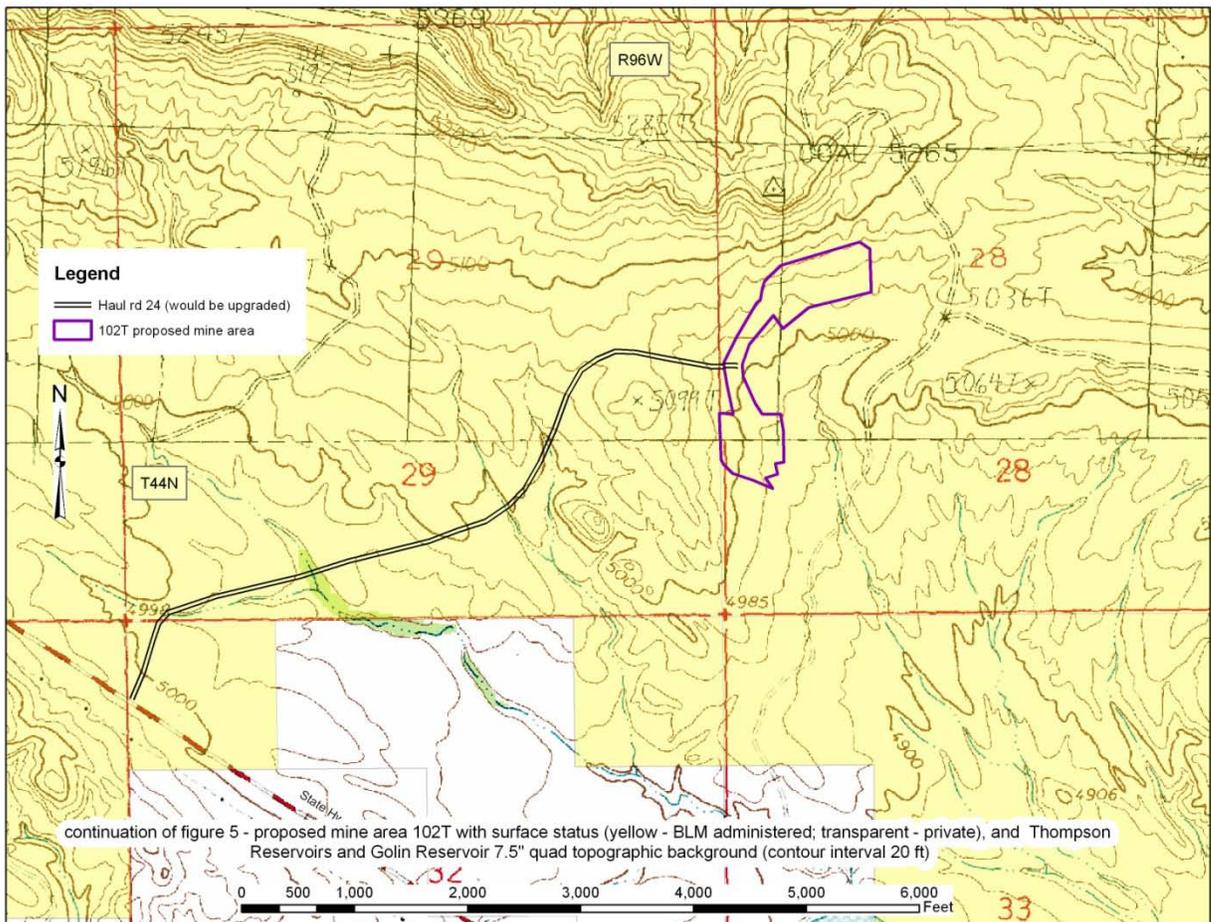
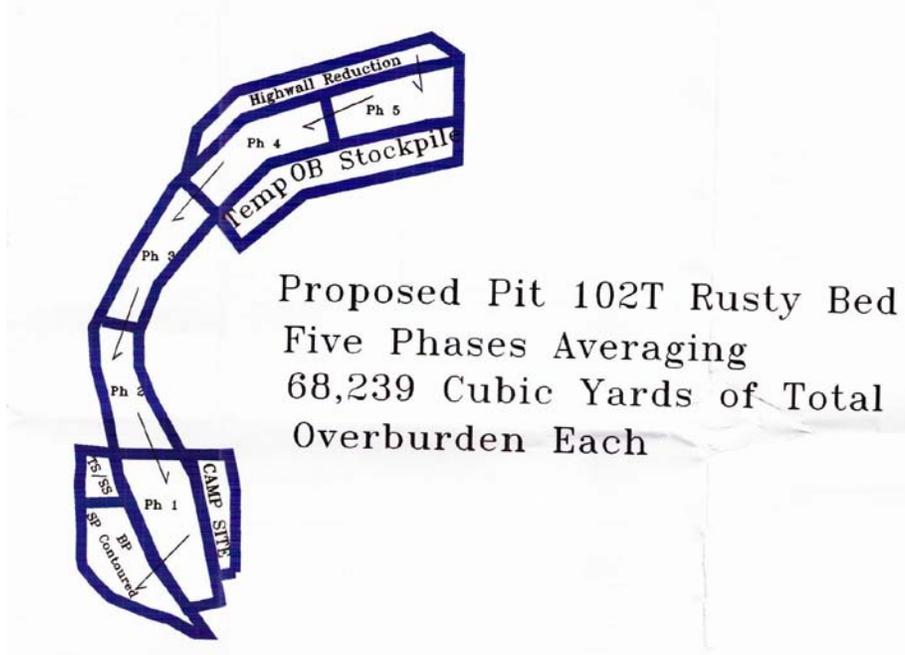
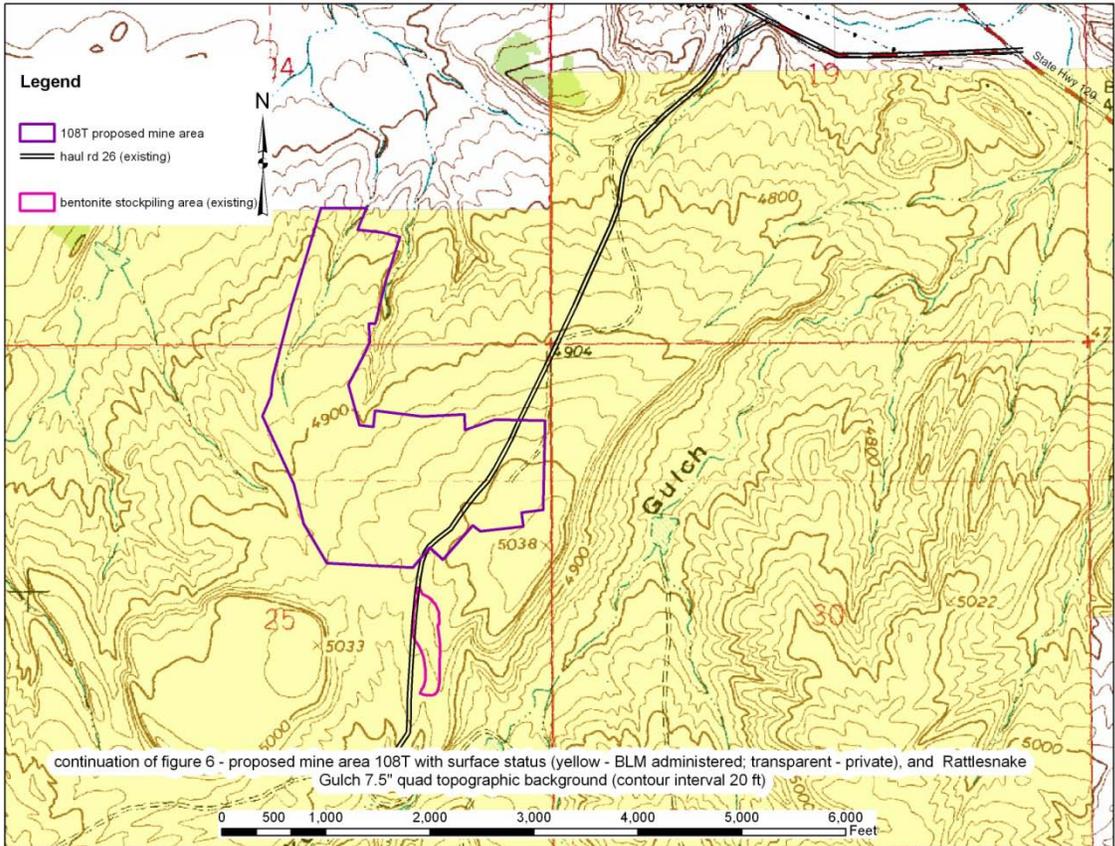
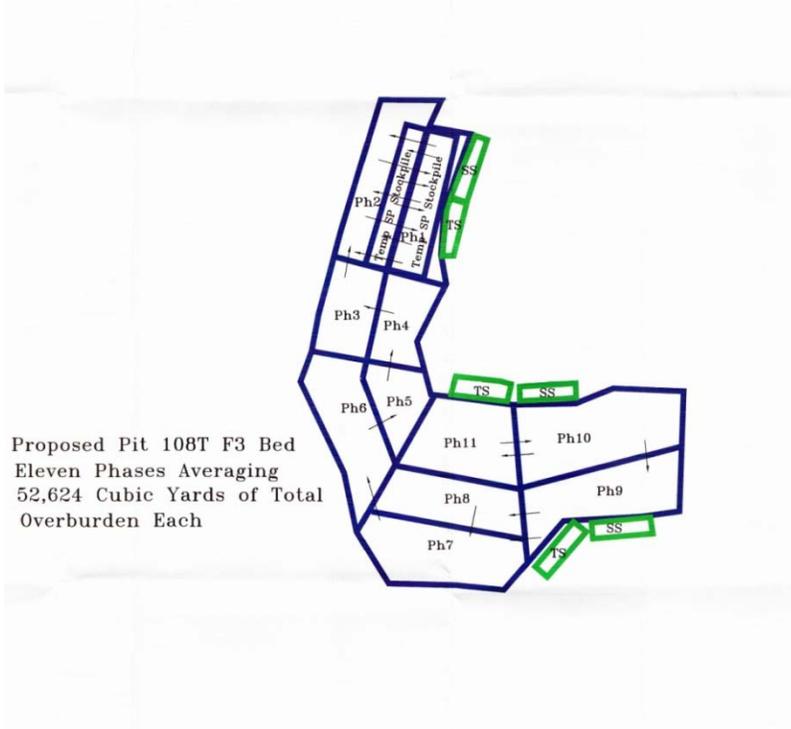


Figure 6. Block phases for pit 108T. Not to scale. Excerpted from operator submitted plan of operation



2.2.1.3 Reclamation

The reclamation/revegetation process would be designed to restore a mosaic vegetation scheme consisting of site specific dominance of various life forms (shrubs, grasses, and forbs) with a diverse species composition. Additional revegetation goals include site stabilization/erosion control and visual aesthetics. Land use restoration goals include wildlife habitat and livestock grazing.

Reclamation backfill would be achieved during the castback mining process using variously sized Caterpillar tractor-scrappers and backhoes depending on availability. The operator’s mining contractors typically use Caterpillar 631 and 637 tractor-scrappers. These are supplemented with Caterpillar tractor-dozers ranging from D-8 to D-11 in size. Dozers, and occasionally large backhoes in narrow pits, are used for backfilling, contouring, and drainage construction.

Final reclamation contours would be consistent with those necessary to reestablish the projected post-mining land use goals of domestic livestock grazing and wildlife habitat. Final slopes and surface contours would approximate native gradients and would blend with adjacent topography. Through drainage would be reestablished in all backfilled phases. Ephemeral channels to be impacted by this proposed mining activity would be temporarily directed around open pits during active mining stages. Channel design for both temporary and permanent diversions would match pre-mine channel gradients and cross-sectional shapes. Temporary diversions would comply with Wyoming Non-coal 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 (including reconstructed channels and adjacent topography) would comply with Wyoming Non-coal rules, chapter 3, section 2 (e) (iv), to be erosionally stable during the passage of the peak runoff from a 100 year, 6 hour precipitation event by matching native drainage gradients, cross section and their flood plains.

Reclamation backfill would follow the castback mining sequence illustrated on Figure 2. Following backfilling and contouring, all compacted surfaces would be ripped to improve water infiltration and retention. Subsoil and topsoil would be replaced from stockpiles or hauled directly during the castback mining sequence. Average topsoil and subsoil redistribution depths are reported in Table 2 below. Where necessary on initial pit cuts, out-of-pit overburden stockpiles would be contoured in-place and used for temporary bentonite and soil stockpile locations. Final reclamation of these areas would include deep-ripping, spreading topsoil/subsoil and seeding. All topsoil stockpiles would be seeded if they are present for more than one year.

Table 2. Projected topsoil (TS) and subsoil (SS) stockpile volumes and average soil replacement depths.

PIT No.	Total affected	Stockpile volume		Average TS/SS	Total TS/SS
	Acres	topsoil (bank cy's)	subsoil (bank cy's)	replacement depth in inches	to be removed in cubic yards
75T	18.8	5,700 yd ³	10,800yd ³	6”/ 15”	15,165 yd ³ / 28,774 yd ³
98T	16.0	4,400 yd ³	12,300yd ³	6”/ 17”	12,907 yd ³ / 36,570 yd ³
102T	20.8	10,700 yd ³	35,000yd ³	6”/ 20”	16,780 yd ³ / 55,930 yd ³
73T/104T	32.8	11,740 yd ³	44,600yd ³	6”/ 23”	26,460 yd ³ / 101,425 yd ³
108T	106.2	35,800 yd ³	18,100yd ³	6”/ 3”	85,670 yd ³ / 42,834 yd ³

The operator would comply with the requirements listed in Non-coal rules, Chapter 13, Section 3 (a) (vi) regarding the timeliness of reclamation.

Timeliness of Haul Road Reclamation

Reclamation of haul roads would be accomplished by contouring to restore drainage patterns, remove culverts, and blend with surrounding topography. These areas would then be deep-ripped, subsoiled/topsoiled and seeded. Haul roads would be reclaimed when they are no longer needed to access pits. There may be situations where a current pit accessed by a particular haul road may be totally reclaimed through seeding, but future pits which may or

may not be permitted to mine would be accessed by that haul road. In those cases, the haul road would not be reclaimed until those future pits are mined and fully reclaimed. Finally, potential situations may occur where the operator may enter into an agreement with the land owner in which the haul road would be left as a permanent access road, but Wyo-Ben would no longer be responsible for maintenance or a reclamation bond.

Drill-Hole Plugging

All drill holes are filled with overburden that is augured out of the hole during the drilling process immediately after the intended drill sample has been obtained.

Feasibility of Pit Backfill

As previously mentioned, the operator would utilize a cast-back mining procedure when stripping pits. This method of mining is both economical and environmentally compatible. Using the castback method allows reclamation to remain concurrent with mining as backfilling and contouring of a previous phase is occurring at the same time the current phase of a pit is being stripped. Moving material between phases of a pit is safer than pushing it laterally into the open hole over the highwall.

Isolation and Control of Acid-Forming, Toxic, or Deleterious Material

The operator would characterize the overburden from the surface down to the bentonite in each pit it plans to mine. In this process, a material sample would be obtained every five feet down to the bentonite and chemical and physical parameters are analyzed. If it is shown that a particular pit has the potential for acidic, deleterious or toxic material near the surface, the operator would attempt to cover it with at least two feet of a more neutral spoil material from adjacent pits in a lateral cast back procedure, or bury that layer deeper in the profile during backfill. If deleterious material (bentonite, spoil) is intentionally placed on the surface, it would be bermed to prevent off-site sedimentation of the material.

Post Closure Management

The operator would monitor all its reclaimed lands post closure for off-site sedimentation, erosion and seeding failures. Off-site sedimentation is controlled by installation of straw bail or fabric check dams into affected drainages. If unacceptable erosion is detected, it is repaired at the first available opportunity. Repair in the past has mostly been accomplished by reconstructing the drainage and lining it with erosion control fabric, rock, or installation of rock gabions. Finally, seeding is monitored on a regular basis. If after three to five growing seasons vegetation establishment is not adequate, Wyo-Ben would determine the reason for failure and mitigate the problem including reseeding of the site.

Revegetation Techniques and Seed Mixtures

Revegetation considerations include use of the area for domestic livestock grazing and wildlife habitat. Revegetation procedures would begin following contouring and topsoiling of the disturbed areas as previously described.

Seedbed preparations may include deep-ripping after soil replacement to break up the surface and loosen the soil. Additional surface manipulations such as deep parallel furrows or pitting may be used to enhance moisture harvesting capacities of the areas receiving seed. Seed mixtures would be broadcast seeded. In general, seeding shall be conducted in the fall and early winter (prior to freeze-up) to take full advantage of fall, winter and spring moisture. From time to time, the operator may attempt spring seeding on areas where live topsoil has been directly placed during winter months to reduce destruction of native species volunteering during the first growing season and prior to what would be the fall seeding period. Attempts would be made to coordinate with the BLM and grazing permittees to avoid excessive early season use on newly seeded areas. The operator would consider the use of temporary fencing to protect these areas if coordination attempts are not successful.

Composition of the proposed seed mixture is detailed below. Use of all species depends on seed availability in the year of seeding.

Seed Species

Rate-lb PLS/acre

Fourwing saltbush (<i>Atriplex canescens</i>)		2.0
Gardner saltbush (<i>A. gardneri</i>)		3.0
Russian wildrye (<i>Elymus junceus</i>)		3.0
Bottlebrush squirreltail (<i>Sitanion hystrix</i>)		0.5
Indian ricegrass (<i>Oryzopsis hymenoides</i>)		3.0
Bluebunch wheatgrass (<i>Agropyron spicatum</i>)	0.5	
Slender wheatgrass (<i>Agropyron trachycaulum</i>)	0.5	
Sand dropseed (<i>Sporobolus. cryptandrus</i>)		0.5
Sandberg bluegrass (<i>Poa sandbergii</i>)	1.0	
Shadscale saltbush (<i>Atriplex confertifolia</i>)		1.0
Cicer Milkvetch (<i>Astragalus cicer</i>)		0.5
Desert Parsley (<i>Lomatium sp.</i>)		1.0
Western Yarrow (<i>Achillea millifolium</i>)	0.5	
Wyoming Big Sagebrush (<i>Artemisia tridentata</i>)	<u>2.0</u>	
	19.0 lb/acre	

Rubber Rabbitbrush and Winterfat may also be seeded onto reclaimed lands at 0.5 pounds per acre. Monitoring of past reclamation successes and failures may influence seed mixture composition and surface preparation techniques.

Quality Assurance

The operator would utilize two drill trucks to characterize the volume and quality of bentonite in the various beds during the development of pits we mine. This allows us to tighten planned disturbance boundaries of our pits, which in many cases, reduces the amount of disturbance that would otherwise occur. Soils of proposed mine areas are characterized to an order 2 level. This allows us to determine the quality and volume of soils that can be saved to produce quality reclamation when conditions allow. The operator commits to save all available top and subsoil for reclamation during the initial stripping part of the mining process, and would either stockpile or spread it live. The stripping of pit phases is accomplished using a castback mining procedure. This practice allows reclamation to be concurrent with mining. Typically, previously mined phases of a pit are reclaimed through backfilling and contouring almost adjacent to the open phase of a pit, with soiled and seeded phases not far from this. Before a pit is backfilled, bentonite cleanings are pushed against the bottom of the highwall to ensure they would be buried deep. In the reclamation of bentonite stockpile areas, the pad (portion of bentonite near the bottom of a stockpile that is not used) is buried, followed by the ripping and soiling of the area. All compacted areas, such as roads and other stockpile areas are also ripped prior to soiling to reduce compaction. The movement of overburden during the mining process is done in a tiered castback process, which places material from the current phase of mining into a previous open pit in approximately the same order as it was removed. This process is employed unless overburden testing reveals the need to place at least two feet of neutral spoil material over a toxic layer near the surface (i.e., very high SAR or acid potential).

2.2.1.4 Operator committed practices

Interim Management Plan

In the event the operator temporarily closes a pit, interim management procedures would be implemented as follows: Berms would be placed in all areas around the pit phase where a highwall occurs. A berm would also be installed at the ramps of the pit to prevent entrance. Temporary water diversions would be made around the pit to prevent water from entering the particular pit phase. Bentonite stockpiles and stockpiles with potential deleterious material (spoil piles, etc.) would be bermed to prevent off-site sedimentation. Ephemeral drainages that have the potential to receive deleterious material would have check dams installed. If soil piles are expected to be in place for an extended period due to the temporary closure of the pit, they would be seeded to prevent erosion and loss of soil. Finally, the pit area would be monitored on a regular basis to determine if problems are occurring that need to be addressed.

Monitoring Plan

The operator would utilize contractors to conduct the mining and reclamation operations of our business. The operator's mining supervisor (currently Greg Sweetser) works with our contractor's field supervisors to ensure that mining is being conducted in a lawful and environmentally responsible manner. The mining supervisor also supervises and directs the reclamation of pits. Monitoring of field operations and contact with our contractor's field supervisors occurs on an almost daily basis. This ensures that mining and reclamation is being conducted according to the operator's standards of mine regulation compliance, reclamation and safety. The operator would monitor its reclaimed lands as explained below in post closure management.

Spill Management Plan

The operator would immediately notify both the Wyoming Water Quality Division (WQD) of the Department of Environmental Quality and the Worland Field Office of the BLM for any accidental spills of petroleum products involving more than twenty-five gallons. Soils contaminated by smaller petroleum spills would be removed to the operator's Lucerne sill site for natural weathering treatment. Additionally, spills of antifreeze or battery acid products would also be reported to BLM/WQD, and soils treated as explained below. Natural weathering treatment would be conducted by spreading the contaminated soils relatively thin over a designated area at the Lucerne mill, where natural decomposition and bacterial consumption of the contaminant can occur.

No solid wastes, either hazardous or non-hazardous, would be disposed of at these sites. All bulk fuel storage tanks would be bermed for spill containment.

Sediment Control

Ephemeral channels draining basins of greater than 5 acres in area would be temporarily directed around open pits during active mining stages. Channel design for both temporary and permanent diversions would match pre-mine channel gradients and cross-sectional shapes. Temporary diversions would comply with Wyoming Department of Environmental Quality Non-coal 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 (including reconstructed channels and adjacent topography) would comply with Non-coal rules, chapter 3, section 2(e)(iv), to be erosionally stable during the passage of the 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. These structures would be moved periodically to accommodate active mining areas.

Noxious Weed Management Plan

The operator would implement the following management plan to address noxious weed control on all of its activities conducted on Federal lands:

- Noxious weeds known by the Hot Springs County Weed and Pest office to exist in the County would be the subject of this weed management plan..
- All The operator, Inc. activity areas and access routes would be inventoried for infestations of noxious weeds of concern. The operator would conduct on-going monitoring of noxious weed presence at all of our activity sites and their access routes and take action, in cooperation with the Hot Springs County Weed and Pest, to remove noxious weeds when located. Any areas found to contain noxious weeds during on-going monitoring would be reported to the Worland Field office of BLM weed coordinator.
- Since mining equipment would be shuttled between Big Horn County and Hot Springs County, all active mining areas of the basin would be inventoried on a yearly basis for the presence of noxious weeds. If noxious weeds are found in active mining areas of Big Horn County where equipment is intended to be shuttled to Hot Springs County, The operator would power wash that equipment to prevent the spread of noxious weeds to Hot Springs County.
- All off-road access would be limited to only necessary routes to minimize impacted areas and reduce spread of weeds.

- Access would be controlled through infested areas until weed removal is accomplished.
- The operator would train mining personnel (including contractor representatives) to identify noxious weeds of particular concern to assist in the monitoring process. Weed identification materials would be made readily available to assist in field identification.
- Vegetation would be reestablished on all soil disturbed by construction, reconstruction or maintenance activities at the first available window of opportunity. This may mean waiting until the fall planting season to help ensure the success of vegetation establishment.
- All seed obtained from commercial sources would be laboratory tested for the presence of noxious weed seed. Native seed offered by local collectors would only be utilized after the operator consults with the collectors to ensure they possess the skills necessary to recognize noxious weeds of concern and sign a statement certifying that they have not collected seed in areas with noxious weed infestations.
- All hay or straw used for check-dam construction or mulching would be certified by the operator as weed-free.

Wildlife

Based on operator's past practices, and information from both the FWS and WG&F contained in their response letters concerning this bentonite mine proposal, the operator is proposing the following operator committed practices intended to reduce impacts to wildlife and its habitat.

Sage Grouse: The operator would observe the following practices for all pits in which sagebrush habitat and sage grouse are known to exist (Proposed Pits of the Red Hole area, and 108T): During the mating season, from March 1 through May 15, no mining or hauling activity would occur within ½ mile of a lek during the consecutive hours between 6:00 pm and 8:00 am to reduce impacts to mating birds due to audio and visual distractions. Furthermore, no initial surface disturbing activities would occur between May 15 (nesting season) and July 15 (brooding season) in areas that are within 0.6 mile of active leks. Areas planned for disturbance that are further than 0.6 mile from active leks would be checked for possible nesting or brooding sage grouse during appropriate times of the year immediately before any activities begin. If nesting or brooding sage grouse hens or chicks are found, mining would be halted until the birds can survive independent of the immediate nest habitat. Other mitigation efforts would include staying current with reclamation, including the separation and saving or direct spreading of top and subsoil in order to increase the chances of quick revegetation success. The operator would use a seed mix that would establish a diverse population of vegetation. Wyoming big sagebrush seed would be targeted to areas most likely to support sagebrush establishment at a rate of two to four pounds per acre. Fencing of new reclamation by the operator would also be considered on a case-by-case basis, mostly based on the expectation of domestic livestock grazing. The operator would consider constructing open water sources when appropriate conditions allow for such structures.

The operator, with the aid of BLM and WG&F, would determine the location of leks that occur near our planned mining areas. Those leks would be monitored three times per year on a yearly basis, usually during the month of April, to determine possible impacts due to mining. Results of monitoring would be displayed in the operator's annual report. If it is determined that the operator's mining is substantially negatively impacting those populations, the operator would consult with BLM/LQD/FWS for mitigation recommendations.

Big game crucial range: The WG&F noted that the location of proposed pit 108T does not occur within designated big game crucial winter range, but mule deer and pronghorn use the habitat year-long. The area of Proposed pit 102T does occur in crucial winter/year-long habitat, and pits of the Red Hole occur within winter/year-long habitat for mule deer and crucial winter/year long habitat for antelope. The operator would voluntarily restrict mining operations to ½ hour before sunrise to ½ hour after sunset during the winter months in those areas considered to contain big game crucial winter range. The operator commits to stay current with reclamation of mine sites, and use a diverse seed mix composed of grasses, forbs and shrubs in order to reduce potential hardships to these animals. Further, with recommendations from BLM/LQD, monitoring routes would be established in known mule deer/antelope habitat to assess impacts to those species throughout the year. If it is determined that mining is having an impact, the operator would consult with WG&F, BLM and LQD regarding further recommendations for mitigation.

Raptors: If an active bald eagle, or ferruginous hawk nest is observed, the operator would contact FWS personnel and avoid activity within a ½ mile (shielded view) or 1 mile (unobstructed sight distance) buffer of the nest. All other active raptor nests would be given a ½ mile buffer from mining activity.

Mountain plover: The operator regards this species as a migratory bird of special interest and conduct ground searches as we the operator would do for other birds in this classification (See paragraph below). If a nest, or nesting plovers are found, the operator would notify the FWS, BLM and LQD for mitigation recommendations.

Migratory birds: The FWS indicated likely habitat exists for certain migratory birds in the project area. The operator would conduct ocular and birdcall surveys within proposed affected areas during the spring breeding period (April 10 to July 10) to determine presence or absence of migratory bird species; and surveys would be conducted according to methodology provided by the FWS. If nesting activity by these species, or any species listed as a “species of special concern” in the Wyoming Natural Diversity Database (Fertig and Beauvais, 1999) is noted, the BLM, LQD and USFWS would be notified for mitigation recommendations.

Aquatic species: To protect aquatic species of Owl Creek and ultimately the Big Horn River, the operator commits to installing fabric fence or certified weed free straw bale check dams on reclaimed drainages that have the potential to release sedimentation off site.

No power lines or fences would be constructed as part of this proposed activity. Postmine topography would be designed to maximize topographic diversity, enhancing both vegetation diversity and wildlife habitat. The operator would observe a recommended haul road speed limit of 45 mph.

If previously unidentified significant habitat or significant wildlife usage are observed during the course of conducting this proposed activity, the operator would implement mitigation and notify all relevant regulatory authority.

2.3 Alternative 2 (Proposed Action with additional Conditions of Approval (COA's))

Based on BLM staff specialists input, certain conditions of approval would be necessary and proper to provide adequate protection of resource values. These include: a speed limit of 30 mph be observed on all dirt roads, adopt all mitigating measures identified for Alternative 1;

2.4 Alternative 3 (No Action)

No action implies that on-going development and other land use activities would be allowed to continue in the area, but the proposed action would be disapproved. Additional plans of operation would be considered by the BLM on a case-by-case basis.

2.5 Alternatives Considered but Eliminated From Detailed Study

The surface location of the proposed action could be situated at different locations. Different surface locations may result in a deviation of effects from the proposed alternative, and may result in a net positive or net negative change in potential effects. However, the relocation may remove the operation from lands where the quality of quantity of bentonite is known through exploration and would not meet the operator needs, may be outside of placer claims located by the Wyo-Ben Inc., or beyond the outcropping of the bentonite clay layer itself. The proposed locations appear to be the best feasible to minimize potential direct effects upon protected resources. This left no unresolved resource conflicts and no identified needs to consider additional alternatives.

3.0 AFFECTED ENVIRONMENT

Resources and features not present, and not discussed in this EA, include: riparian areas, Class I visual management areas, Class I Airsheds, prime or unique farmlands, Wild and Scenic Rivers, wetlands, wilderness. Other than livestock grazing and wildlife use, there are no known land uses, or proposals for use, that occur in the area such as special recreation areas that would be affected by, or have the potential for cumulative impacts with this proposed action.

3.1 Location and Land Ownership

The proposed bentonite pits and related roads are located in Hot Springs County Wyoming, and 6th principal meridian. Legal descriptions down to the section are found in Table 1 of this document. The pits would be located on lands owned and managed by the federal government (BLM), except for the eastern and western ends of pit 98T that occur on State lands and a portion of the haul road thereto. Certain portions of haul road 26 and 28 cross private lands.

3.2 Geology

Sedimentary rocks of Cretaceous age outcrop at the location of proposed mining. They include the Frontier Formation that contains the company designated F-3 bentonite bed, and the Mowry Shale that contains the so-called Rusty and Mowry A bentonite beds. Those beds are listed on Figures 4, 5 and 6. The formations are deformed and dip at various angles in response to folding of the rocks along the southern margin of the larger geologic feature called the Bighorn Basin. The bentonite beds of interest to the company have been mined in the area, see figures accompanying the cumulative affects section of this EA.

3.3 Hydrology

The proposed plan lies within the Kirby Creek Watershed known by the Hydrologic Unit Code (HUC) #1008000705. There are 3 sub-watersheds inside the Kirby Creek Watershed that are within the cumulative affects area; these are Lower Kirby Creek (HUC # 100800070505), Middle Kirby Creek (HUC# 100800070504), and Alkali-Kirby Creek (HUC# 100800070502). The other sub-watersheds affected in the western pit localities are the Coal Draw (HUC#100800070404) and Owl Creek (HUC#1008000703). These drainages within all of these watersheds are all tributaries to the Bighorn River.

3.3.1 Surface Water / Surface Water Quality / Riparian.

There exist 2.35 miles of intermittent public stream segments within the cumulative affects area. The area is also dissected by 2.75 miles of inventoried ephemeral drainages within the area. These tributaries flow north into Kirby Creek which is a primary tributary to the Bighorn River. The drainage patterns would be temporarily re-routed around the proposed pits.

The riparian area impacts include possible additional erosion and deposition from the increased activity around the pits and from new roads in the area. The riparian areas if they receive excessive amounts of sediment can become unstable, more erosive and degrade in their functioning capability. Currently there is 0.82 miles of stream segment along Rock Springs Draw that is rated as functioning at risk with a downward trend, due to head cutting of soil, blocked culverts and blown out roads near the stream.

There are also 52 stock reservoirs that are found within these sub-watersheds, these are located within the cumulative affects area. These reservoirs capture surface flow, trap sediment and provide water sources for livestock and wildlife.

The reservoirs within the area that may receive potential indirect effects is the Shumway Stock reservoir, located 0.35 miles below Pit #108T in the SESW Sec.24 T 43N R96W, also a reservoir in SW Sec.7 T 43N R93W, both have the potential to receive increased sedimentation during a large storm event.

3.3.2 Ground Water / Ground Water Quality

Using all available USGS ground water data and the Wyoming State Engineer online database, the Rock Springs Well was located. This well lies within pit #75T located in SENE Sec 13 T 43N R 94W (USGS#434144108043601). The ground elevation of the well is 4750 feet above sea level with the completed depth of 559 feet below land surface. This well is completed in the lower Cretaceous Cloverly Formation aquifer. The static water level in 1970 was at 35 below surface elevation (4715 ft above sea level). The Cloverly Formation is located below the Frontier and Mowry Formations to be mined according to this plan. According to the well log there is no evidence of any water bearing formations above 500 feet in depth that are expected to be encountered.

Significant springs located nearby the proposed pits are the following in T 43 N R 93 W: Red Springs, NWSW Sec 17, and Rock Spring SESW Sec 7, these springs are found in the Cretaceous Mowry Shale and the Frontier Formations. There are also various other smaller springs that have been developed within the cumulative affects area.

3.4 Air Quality

No site-specific air quality data are available from the plan of operation area. There is general information about Bighorn Basin-wide background air quality as shown in the Table 3 below (BLM, 2009). The plan area is within the southern part of the Bighorn Basin. The background air quality within the basin is in compliance with state and national ambient air quality standards as listed in Table 2. The air-shed within the proposed plan area is classified as PSD Class II (Prevention of Significant Deterioration; Wyoming DEQ, 2008). The PSD program under the Clean Air Act ensures air quality in areas with clean air does not significantly deteriorate, while maintaining a margin for future industrial growth. In PSD II areas, moderate incremental increases in pollutant concentrations are allowed, although the concentrations are not allowed to reach the concentrations set by the Wyoming and National Ambient Air Quality Standards as listed on the table.

Table 3. Concentrations of Criteria Air Pollutants and Background Air Quality for the Bighorn Basin Planning Area (BLM, 2009)

Pollutant	Averaging Time	NAAQS ($\mu\text{g}/\text{m}^3$)	WAAQS ($\mu\text{g}/\text{m}^3$)	Background ($\mu\text{g}/\text{m}^3$)	Data Source
Carbon Monoxide (CO)	1 hour ¹	40,000	40,000	1,979	Data collected from Yellowstone National Park, WY near 'Old Faithful' geyser during 2005.
	8 hour ¹	10,000	10,000	931	
Nitrogen Dioxide (NO ₂)	Annual (Arithmetic Mean)	100	100	3.4	Thunder Basin National Grassland
Ozone (O ₃)	1 hour ²	235	235	169	
	8 hour ³	157	157	141.3	
Particulate Matter (PM10) ⁸	24 hour ⁴	150	150	N/A	Wyoming Department of Environmental Quality (DEQ), State and Local Air Monitoring Station (SLAMs)
	Annual (Arithmetic Mean) ⁵	Revoked Dec. 2006	50	16.1 18.6	
Particulate Matter (PM2.5) ⁸	24 hour ⁶	35	65	11 3.9	DEQ SLAMs
	Annual ⁷	15	15	3.3 7.5	
Sulfur Dioxide (SO ₂)	3 hour ¹	1300	695	93	Data collected at the Lost Cabin Gas Plant – preconstruction monitoring in Fremont County, WY 1986-1987.
	24 hour ¹	365	260	32	
	Annual (Arith. Mean)	80	60	4	

1 Not to be exceeded more than once per year.

2 The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 235 $\mu\text{g}/\text{m}^3$ (micrograms per cubic meter) is less than 1. As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the fourteen 8-hour ozone non-attainment Early Action Compact Areas.

3 To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each

Table 3. Concentrations of Criteria Air Pollutants and Background Air Quality for the Bighorn Basin Planning Area (BLM, 2009)

monitor within an area over each year must not exceed 157 $\mu\text{g}/\text{m}^3$.
4 Not to be exceeded more than once per year on average over 3 years.
5 Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM10 standard in 2006 (effective December 17, 2006).
6 To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 $\mu\text{g}/\text{m}^3$ (effective December 17, 2006).
7 To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 $\mu\text{g}/\text{m}^3$.
8 Particulate matter data collected by Wyoming DEQ-Air Quality Division (AQD) at Emerson Building, Cheyenne, Wyoming, Year 2001, second highest 24-hour concentrations. These data were determined by Wyoming DEQ-AQD to be the most representative co-located PM10 and PM2.5 data available.

The primary air-borne pollutant within the plan of Operation area is Particulate Matter (PM) 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 diesel fuels by trucks and buses, incineration of garbage, mixing and application of fertilizers and pesticides, road construction, mining operations, agricultural and forest burning, and operation of fireplaces and woodstoves. There are no air quality monitoring stations within Hot Springs County so there is no local background air quality information available. The closest ones are in Cody, Sheridan, Lander and Casper (Wyoming DEQ, 2008). No monitoring of past and current open pit bentonite mines has been conducted, so quantitative information about pollutant emissions as listed in Table 3 are not available. An air quality permit from the Wyoming Department of Environmental Quality has not required for the operation of bentonite mines within the Bighorn Basin.

3.5 Soils

The soil characteristics in the project area are as varied as the landscapes on which they were formed. The most ubiquitous and limiting soil characteristic is shallow depth to bedrock with the majority of the soils being characterized as being shallow to moderately deep (<20-40 inches). In addition, there are significant areas of saline soils in all but the western most parcels. The western portion of the project area contains deep, clayey soils contrasted with shallow, sandy soils within the same landscape setting. Throughout the project area there are areas of deep, loamy soils but, these are limited in scope. Slope range from 0 to 60 percent.

Soil in the project area support a sagebrush bunchgrass and desert shrub plant communities. The dominant Ecological Sites are listed below:

Saline Upland 10-14 inch p.z. R032XY344WY

- Shallow Loamy 10-14 in .pz. R032XY362WY
- Shallow Clayey 10-14 in. pz. R032XY358WY

Runoff and erosion rates were calculated for the project area using the Water Erosion Prediction Project (WEPP), U.S. Forest Service web based interfaces. Based on WEPP, natural erosion rates are low averaging only 0.1 tons per acre per year; however based on a 50-year return interval erosion rates could approach 2.4 tons per acre per year.

Shallow soil depths, saline soils and soils high in clay content would make reclamation difficult. To aid in reclamation success, a more detailed Order 1 soil survey has been conducted by the WyoBen. This survey has mapped and quantified areas of soils suitable for use as reclamation cover. This soil survey data prepared by WyoBen is available in the mine plan.

Soil characteristics with respect to their limitations for reclamation are depicted in the two soil maps (Figures 7 and 8).

Figure 7. Soil limitations, eastern parcel.

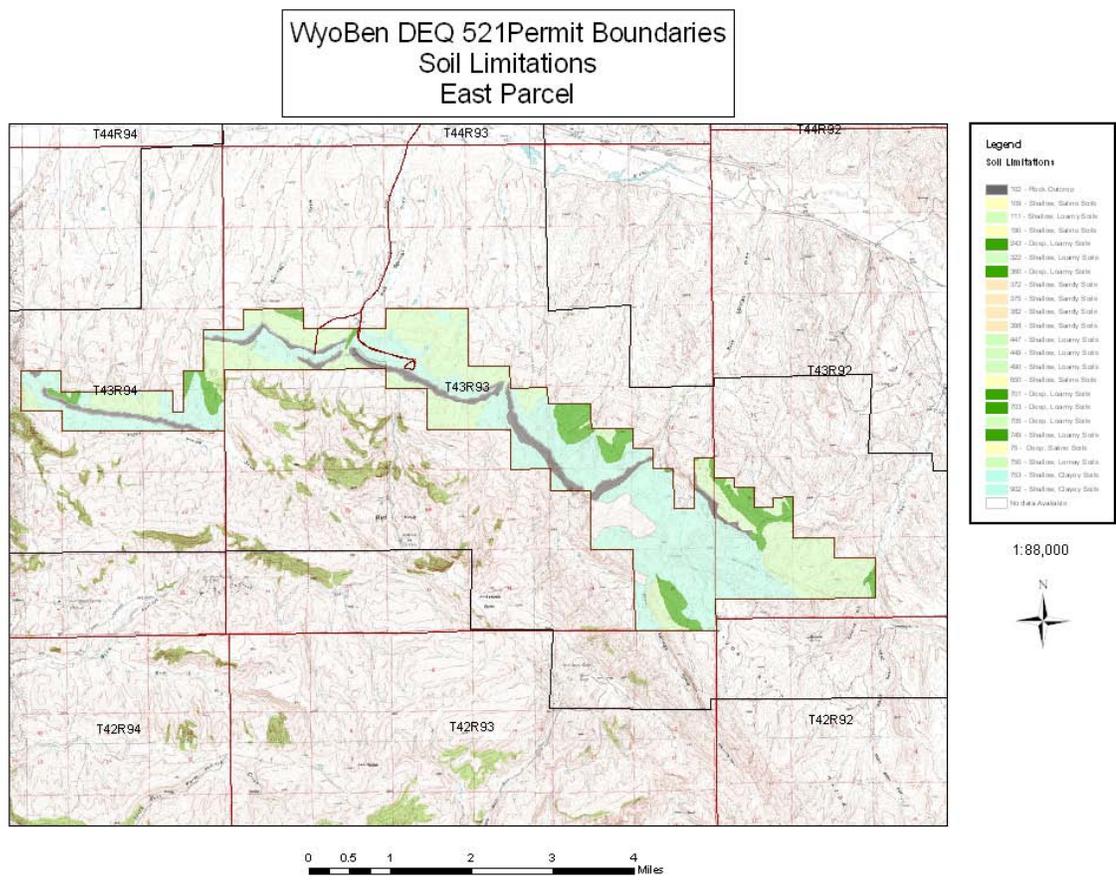
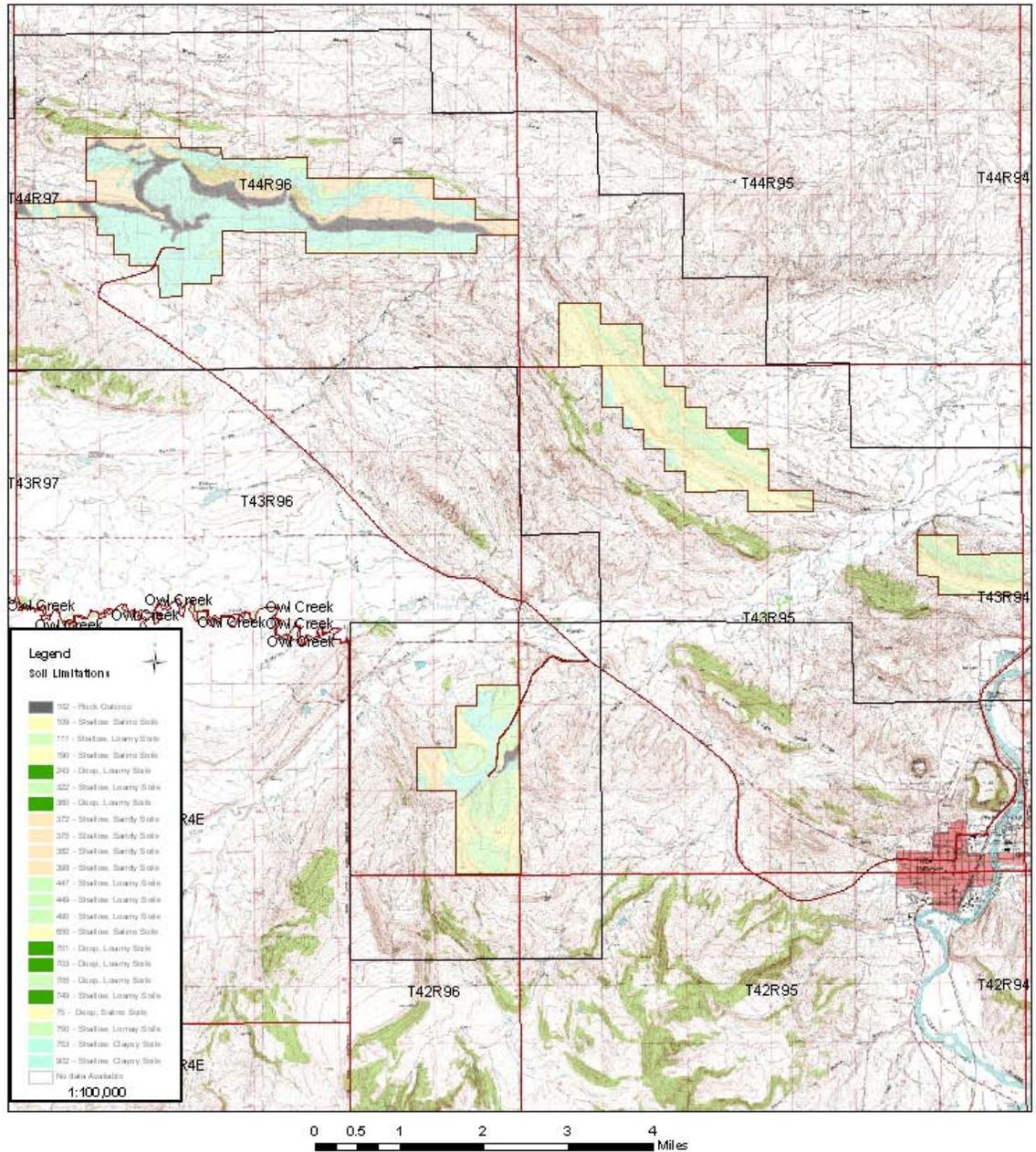


Figure 8. Soil limitations, western parcels.

WyoBen DEQ 521 Permit Boundaries
Soil Limitations
West Parcels



3.6 Vegetation / Invasive Plant Species

3.6.1 Vegetation

The majority of the project area within proposed pits 73T/104T, 75T, and 98T would affect Loamy and Shallow Loamy 10-14 inch range sites involving approximately 57 acres. The remaining 12 acres of disturbance include previously disturbed land and bare outcrop with sparse vegetation.

A perennial grass/big sagebrush community makes up the majority of the Loamy ranges sites. This plant community is dominated by cool-season grasses, while short warm-season grasses and miscellaneous forbs account for the balance of the understory. Plains prickly-pear cactus and weedy annuals also occur in some areas of this community.

A perennial grass/mixed shrub plant community makes up the majority of the Shallow Loamy range sites. This plant community is dominated by cool-season grasses, while short warm-season grasses and miscellaneous forbs account for the balance of the understory. A variety of shrubs is a conspicuous part of the overall production.

At the proposed location of pits 102T and 108T, field observations of the grazing allotments indicate the location to be primarily loamy/shallow loamy/clayey sites. The vegetative community is comprised of cool season perennial grasses dominating, with an influence of woody species and forbs.

3.6.2 Invasive Species

Invasive weed species known to exist within the proposed mining areas include but are not limited to: Canada thistle, Musk thistle, Russian knapweed, Houndstongue, Saltcedar, Russian olive, and Whitetop. The proposed mining areas East of Thermopolis lies within the Kirby Creek Weed Management Area and CRM (Coordinated Resource Management). This area is intensely monitored for the presence of noxious and invasive weed species and an aggressive weed treatment program is in place.

3.7 Livestock grazing

Pits 73T, 75T, 98T, and 104T occur in the Red Springs Allotment (#00658). There are 2,286 acres in the allotment. The public lands are stocked at 5 acres per AUM. Livestock are permitted in the allotment as follows;

Red Springs Allotment

85 cattle	May 15 to June 30	88% P.L.	116 AUMs
85 cattle	July 1 to August 15	88% P.L.	113 AUMs
85 cattle	August 16 to October 17	88% P.L.	155 AUMs

Red Springs Allotment is involved in a deferred rotation with the Black Willow Allotment (#00659). Spring use (May 15 to June 30) is authorized every other year.

Pit 108T would occur in three different allotments. These allotments are the Shumway Ind. No. 00648, the South Owl Creek No. 00610, and the Plummer No. 00635. The allotments are permitted for grazing use by three different permittees. Grazing occurs as follows:

Shumway	July 15 to August 31
South Owl Creek	May 15 to August 15 (1 of 3 years)
	July 15 to October 15 (2 of 3 years)
Plummer	April 15 to December 1

Pit 102T would occur in two different allotments. These allotments are the South Coal Draw No. 00645 and the Steer No. 00647. The allotments are permitted for grazing use by a single permittee. Grazing occurs as follows:

South Coal Draw	September 1 to January 31
Steer	September 1 to January 31

Figure 9. Range allotments, impacts to existing range fences and fence division as mitigation, pit 108T

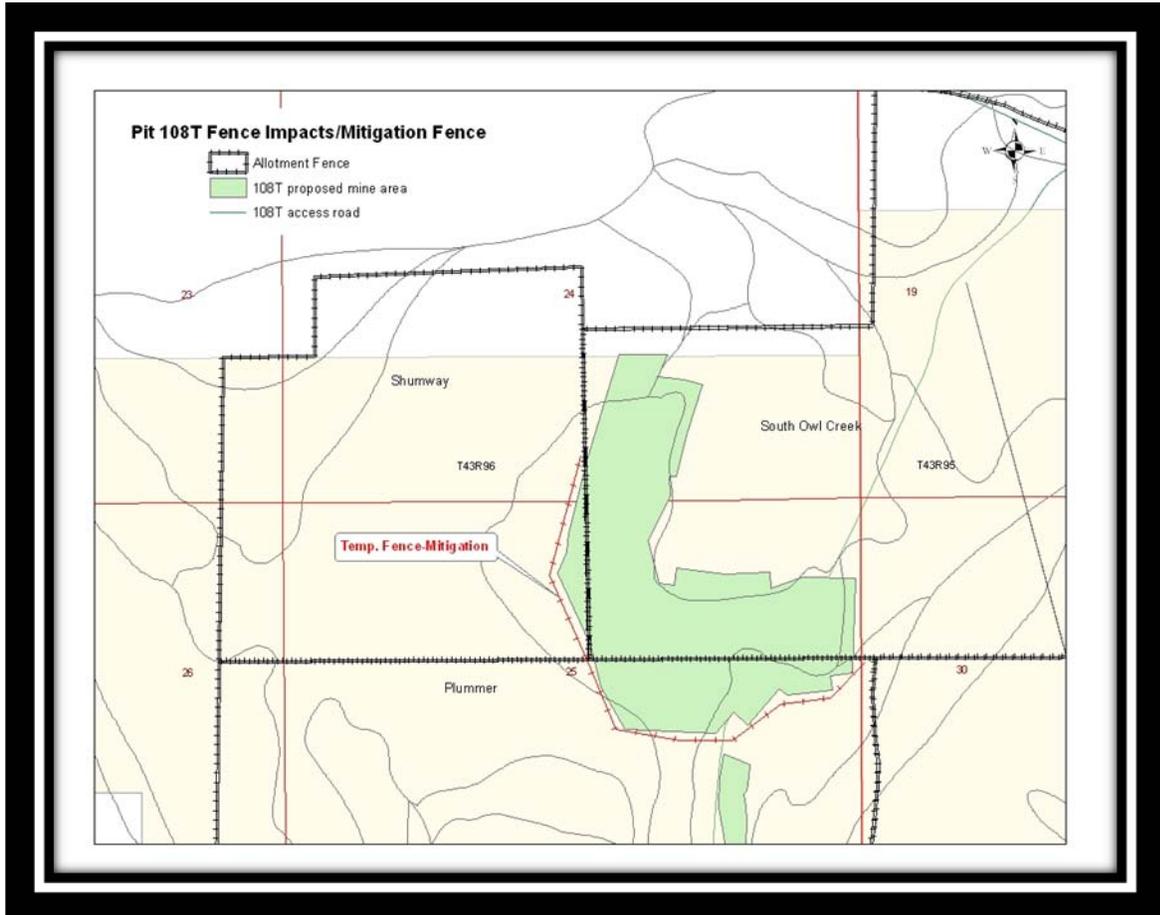
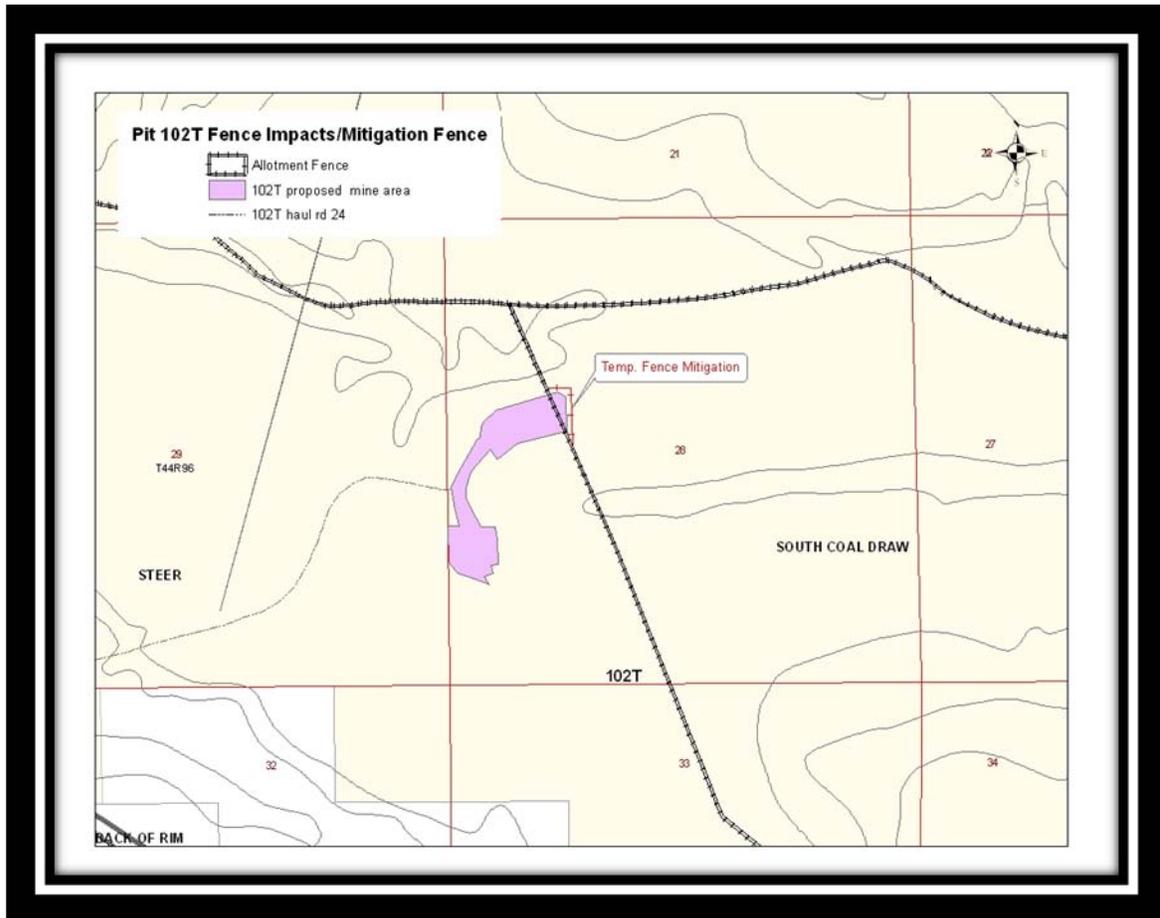


Figure 10. Range allotments, impacts to existing range fences and fence division as mitigation, pit 102T



3.8 Wildlife

Portions of the proposed project areas are designated as big game crucial wintering habitat. These areas play an important role in the winter survival of elk, mule deer, and antelope. Mule deer and antelope are known to utilize these habitat areas on a year-long basis. Wildlife habitat exists in the proposed project areas for numerous additional species such as sage-grouse, numerous small mammals and predators, passerines, and raptors. Many sagebrush obligate migratory bird species use this area including the following: sage sparrows, sage thrashers, horned larks, vesper sparrows, Brewer's sparrows, and loggerhead shrikes. These songbirds mate, nest, and over-summer in the areas proposed to be mined.

3.9 Threatened & Endangered Species

3.9.1 Threatened, Endangered, Candidate, and BLM Sensitive -- Plant Species

There are no threatened and endangered or BLM sensitive plant species in the project areas.

3.9.2 Threatened and Endangered, Migratory, and BLM Sensitive – Wildlife Species

There is active breeding, nesting, and early brood-rearing habitat for greater sage-grouse within the proposed project areas. Mining activity may also affect the quality of nearby habitat found to be suitable for mountain plover. Numerous raptor nests where nesting activity may be disturbed have been identified in or near the proposed project areas. The proposed mining area is suitable habitat for two BLM sensitive species, white-tailed prairie dogs and greater sage-grouse, though only greater sage-grouse are known to be using the area. There are no threatened or endangered wildlife species known to exist in the project areas.

3.10 Recreation and Visual Resources

3.10.1 Recreation

The project areas are located on BLM-administered public lands managed as an Extensive Recreation Management Area (ERMA). Recreation management objectives for the ERMA are custodial management, which includes addressing use and user conflicts, public health and safety, and resource protection. Recreation resources in an ERMA is not the priority resource managed for, but is a recognized land use in response to the recreational resources within the area. Such management includes signing, facility development in response to resource protection, visitor health and safety, or use and user conflict, monitoring, trend data collection, and enforcement. Recreational activities include consumptive, non-consumptive, motorized, and non-motorized uses. Hunting, fishing, hiking, horseback riding, sightseeing, rock collecting, camping, and driving for pleasure (including ATV, 4-wheel drive, and motorcycle activities) are popular in these areas. The project areas are located in accessible BLM-administered public lands within close proximity to Thermopolis, which provides for recreational opportunities targeted for a community-based market. Recreational settings are assessed as middle to front country. Such criteria includes on or near 4-wheel drive roads on a naturally-appearing landscape except for obvious primitive roads to on or near improved county roads on a landscape partially modified by roads, utility lines, but none overpower the natural landscape. BLM-administered public lands south of project area 108T was analyzed as a Special Recreation Management Area during the Grass Creek RMP, but determined to be managed as an ERMA (Grass Creek RMP, 1998). Travel management limits all motorized use to existing roads and trails.

3.10.2 Visual Resources

Visual inventories of the project areas were completed in the late 1970's and early 1980's, and have rated most of the project area as moderately scenic and sensitive, with the exception of public lands surrounding 108T, which rated as highly scenic and sensitive, thus prescribed the area as a class II. The rest of the project areas are located on BLM-administered public lands managed as a Class III and IV Visual Resource Management (VRM) areas.

Class II objectives are to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class III VRM objectives are to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

The objectives of class IV are to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements of form, line, color, and texture.

3.11 Cultural and Historical Resources

A Class III cultural inventory was conducted of the proposed project area. No historic properties will be affected. The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If paleontological, historical or archaeological materials are uncovered during operations, the operator is to immediately stop work that might further disturb such materials, and contact the authorized officer (AO).

Within ten (10) working days the AO will evaluate the discoveries and take necessary actions to protect or remove the resource. Decisions regarding the appropriate measures to mitigate effects to such resources will be made in consultation with the operator.

3.12 Socioeconomics and Environmental Justice

The proposed plan is within Hot Springs County which had an estimated population of 4,553 in 2005, a 6.7 percent decrease from April 2000 (US Census Bureau, 2009). 24.5% of the population is over age 65 and 21% are disabled. As shown on Figure 1 the proposed pits are east and northwest of Thermopolis and East Thermopolis

which had populations of 3,172 and 274 respectively in 2000 (latest town specific information available). In 2005 the per capita income was \$31,763 in Hot Springs County. Mining at 30% and government at 25% were the largest contributors to earnings by place of work within the County, with health care and social assistance at 10%. For a complete listing see Table 2-50 in the Analysis of the Management Situation for the Bighorn Basin Resource Management Plan Revision Project, BLM 2009. The mining sector includes jobs in oil and gas sector. There was no shipment of manufactured products from the County in 2007.

The population of Hot Springs County consisted of 4.3% who are classified as minority (non-White) and 11% that are low income; i.e., live below the poverty level. Bureau of Land Management Instruction Memorandum no. 2002-164 implements Executive Order 12898 of Feb. 11, 1994 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." Such populations would be able to review information about this mine plan during a 30 day review period this is a requirement of 43 CFR 3809.411(c).

3.13 Hazardous Materials / Public Health and Safety

The operator would utilize mechanized earthmoving equipment as part of mine and reclamation activities and there would be some on-site fueling and repairing of equipment. There may be accidental spills of fuels, lubricants, antifreeze, and battery acids. The operator submitted a spill management plan with their plan, under section 2.2.1.4 above which outlines how spills would be handled.

The public and public land users who travel the existing improved dirt roads that the operator would use to access the six pits would notice an increase in traffic when equipment is being mobilized or demobilized from the pits or hauling of bentonite is taking place. These dirt roads were constructed to resource functional classification as per BLM manual section 9113 with a design speed of 30 mph where the terrain is level and rolling. The operator has committed to dust control measures as needed when bentonite is actively being hauled along the dirt portions of their designated haul roads and to upgrade and maintain such segments to the standards in the BLM's road standards manual section 9113.

3.14 Paleontology

The project area is located in geological formations with moderate sensitivity for paleontological resources. A paleontological inventory is not required in advance. The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing paleontological localities, or for collecting vertebrate fossils. If paleontological, historical or archaeological materials are uncovered during operations, the operator is to immediately stop work that might further disturb such materials, and contact the authorized officer (AO).

Within ten (10) working days the AO will evaluate the discoveries and take necessary actions to protect or remove the resource. Decisions regarding the appropriate measures to mitigate effects to such resources will be made in consultation with the operator.

4.0 ENVIRONMENTAL CONSEQUENCES

4.0.1 Mandatory Critical Elements

Table 4. Mandatory Critical Elements	PROPOSED ACTION	PROPOSED ACTION WITH COA'S	NO ACTION
Air Quality	See section 4.4.1	See section 4.4.2	See section 4.4.3
Special Designated Areas; e.g., ACEC, natural area, etc.	Not present		
Cultural Resources	Not present		
Prime or Unique Farmlands	Not present		
Flood Plains	Not present		
Native American Religious Concerns	Class III cultural inventories revealed the project area does not contain Native American cultural resources.		
Hazardous Wastes	See section 4.13.1	See section 4.13.2	NOT AFFECTED
Water Quality	See section 4.4.1	See section 4.4.2	NOT AFFECTED
Wetlands/Riparian Zones	Not present		
Wild and Scenic Rivers	Not present		
Wilderness	Not present		
Environmental Justice	Minorities do not exceed 50% of the population of Hot Springs County, and here are no low-income communities which would be disproportionately affected by the proposed action (directly, indirectly or on a cumulative basis)		
Invasive, Non-Native Species (Weeds)	See section 4.6.1.2	See section 4.6.2.2	See Section 4.6.3.2
Threatened or Endangered Species	None present.		

4.1 Land Use

4.1.1 Alternative 1 (Proposed Action)

The dominant land use for the proposed mine areas is domestic grazing. Additional uses include oil and gas development, wildlife habitat, hunting, and exploration for and mining of bentonite.

Disturbances over the life of the mine would amount to about 200 acres potentially over a period up to 20 years in length (See Table 1).

The operator proposes a castback mining method that would minimize the acreage disturbed at each pit at any

particular time and promotes concurrent reclamation. The Wyoming DEQ-LQD would hold a reclamation bond that is only releasable when the reclamation is found to be to the satisfaction of both the BLM and the DEQ. The bond amount held by the DEQ is re-evaluated annually.

4.1.2 Alternative 2 (Proposed Action with COA's)

4.1.3 Alternative 3 (No Action)

Under the No Action Alternative, the development of the Proposed Action would not occur. No effects on additional land resources would be expected to occur beyond the current land uses of the project area.

4.2 Geology

4.2.1 Alternative 1 (Proposed Action)

The mining of the layer of bentonite from each of the pit areas would cause of irretrievable loss of that locatable mineral resource since it would be removed from the area. There is no established threshold of significance regarding removal of minerals from the national system of public lands, though the resource management planning decisions do allow for permitting such activities. Surface mining of locatable minerals is reasonable and customary practice following the evaluation of such bedded deposits and overburden materials, 43 CFR 3809.420(a)(2). Surface mining of bentonite is practiced in many other parts of the Bighorn Basin where beds of bentonite are exposed at the surface.

4.2.2 Alternative 2 (Proposed Action with COA's)

Same as 4.2.1 above.

4.2.3 Alternative 3 (No Action)

The locatable mineral estate would be preserved if mining under a plan of operation is denied. Other approved mining operations in the area would continue and the claimant-operator would have an opportunity to apply to mine bentonite in other areas within Hot Springs County or otherwise within the Bighorn Basin where bentonite outcrops.

4.3 Hydrology

4.3.1 Alternative 1 (Proposed Action)

The hydrology of the drainages would be altered temporarily by the re-routing of water around the pits. The proposed submitted mine plan states that the all drainages would be returned to pre-mine gradients and cross sectional shapes. This would change the nature of the flow patterns surrounding the pits and downstream of the pits. Possible new sediment would be introduced into the watershed if the area received a precipitation even greater than 2 year, 6 or the 100 year 6 hour maximum precipitation events as defined in the Non-coal rules, chapter 3, section 2 (e) (iv) to be erosionally stable. The operator has committed to the practice of using sediment control fabric fences that would minimize the impacts.

4.3.1.1 Surface Waters/Water Quality (surface)/ Riparian

Surface Water

Surface water quality could be affected by the Proposed Action. During the proposed mining process, natural drainage patterns would temporarily be disrupted, altering drainages and increasing overland flow mainly following precipitation events. Due to the lack of vegetation, biological crusts, and desert pavement, run-off from the proposed mining areas may transport excess sediment and water with higher level of sediment load into the watershed than was previously present in the system. Significant ephemeral channels (drainage basins of greater than 5 acres) would be temporarily directed around open pits during active mining stages and straw bale sediment barriers would be utilized as sedimentation control measures.

Through drainage would be required to be reestablished during final reclamation. Channel design for both temporary and permanent diversions would match pre-mine channel gradients and cross-sectional shapes and dimensions. After reclamation, drainage would temporarily be affected until vegetation has recovered to pre-mine conditions. Mitigation is listed and incorporated as part of the Hot Springs County Wyo-Ben Inc Plan of Operation.

The impacts from the 3 new haul roads. The other proposed roads would create more compaction of soil and runoff from the road surfaces.

According to the mine plan there would be a minor streambank impacts due to necessary re-sloping of the low water crossing along the drainage to access pit #75T.

Water Quality

Currently Kirby Creek is listed on the Wyoming 2006 Section 303 (d) List, Table A: 303(d) waterbodies that are threatened but lack credible data sufficient to warrant classification as impaired. The creek has sporadic and elevated levels e-coli bacteria that lead to its impaired listing from a USGS sample collected in 2002. In response there has been monitoring efforts in 2005, 2006 and 2007 in accordance with Wyoming Credible Data Requirements to greater understand this problem. Increased runoff and sedimentation from the proposed action would have an indirect affect on water quality by increasing water temperature and stimulate bacterial growth such as e-coli.

The surface water quality runoffs from geologically similar areas within the basin tend to have elevated amounts of suspended sediment, total dissolved solids and pH levels above 8.5.

Riparian

The 2.35 miles of intermittent riparian area impacts include possible additional erosion and deposition from the increased activity around the pits and from new roads in the area. The riparian areas if they receive excessive amounts of sediment can become unstable, more erosive, and degrade in their functioning capability. Below proposed pit #75T there is 0.82 miles of stream segment along Rock Springs Draw (BLM ID # I0392X & I0393X) that have been evaluated 4 times since 1994, most recently it was rated as functioning at risk with a downward trend, due to head cutting of soil, blocked culverts and blown out roads near the segment. A continued downward trend is possible due to increased activity in the area.

4.3.1.2 Ground Water/Water Quality (ground)

Ground water quality may be affected by the proposed mining. It could be effected either by water infiltration in the proposed mining area or by sedimentation or run-off leaving the site that may eventually make its way into the ground water. It is not likely that ground water would be directly affected through infiltration in the pits. The Rocks Springs Well as cited in above in section 3.3.2 indicated no significant water bearing formations at depths above 500 feet below the surface. Not only is there a few hundred feet of material above the water table to filter out any additives from the bentonite, but the water would have to penetrate through the remaining bentonite in the ground, which swells and has almost zero permeability once it is wet; it is more likely to evaporate than to infiltrate. If water escapes Wyo-Ben, Inc.'s berms and runs off site, it may make it to an area where it would eventually make it into the groundwater. Sediment escape from the site caused by wind, water, or mining related activities (bentonite on haul truck tires falling off out of the mine area) could introduce trace amounts of bentonite into water that may eventually make it into the ground water.

4.3.2 Alternative 2 (Proposed Action with COA's)

Same as 4.3.1 Alternative 1

4.3.3 Alternative 3 (No Action)

4.3.3.1 Surface Water/Water Quality(surface)/Riparian

There would be no alterations to the flow of surface water within all of the proposed drainages; there would be no impact to the surface water resources, because the proposed Plan of Operation would not be approved.

The indirect negative effects to water quality in the watersheds would be reduced, the current conditions would either be maintained or improve due to lower amounts of potential sediment being introduced into the watershed by the proposed roads and pit operations, because the proposed Plan of Operation would not be approved.

The riparian segments would likely maintain their current conditions or improve in their functioning capacity within the watersheds, because the proposed Plan of Operation would not be approved.

4.3.3.2 Ground Water/Water Quality (ground)

There would be no negative impacts to ground water or water quality, because the Plan of Operation would not be approved.

4.4 Air Quality

4.4.1 Alternative 1 (Proposed Action)

The operator committed practices of watering haul roads and cast back mining should reduce the release of fine earthen particulate materials into the air. The tail pipe emissions from the operation of internal combustion engines as part of mining, hauling and reclamation activities should quickly dissipate and would not cause the ambient air quality standards cited in Table 3 to be exceeded. No mitigating measures are recommended.

4.4.2 Alternative 2 (Proposed Action with COA's)

Same as 4.4.1 above

4.4.3 Alternative 3 (No Action)

Background air quality would continue as cited in Table 3. This would mean the air quality in the area would not exceed the National or Wyoming Ambient Air Quality Standards.

4.5 Soils

4.5.1 Alternative 1 (Proposed Action)

Surface disturbance increases runoff and erosion. Following surface disturbance, WEPP predicts that runoff rates would increase five times above natural conditions. Without operator committed controls erosion rates are predicted to average 6.1 tons per acre per year; however based on a 50-year return interval, erosion rates could approach 35 tons per acre per year. Post reclamation erosion rates for the 1 to 10 year period until adequate cover is obtained, are predicted by WEPP to average 1.1 tons per acre per year; again erosion rates based on a 50-year return interval could approach 13 tons per acre per year during this time.

Though reclamation activities would be conducted as an integral part of post-mining operations, overall soil health would be impacted through the alteration of the soil physical properties. There would be less organic matter in the surface layers and soil structure and soil depths would be altered; however, the operator's proposed action could lead to a more rapid recovery of soil health with respect to soil physical properties.

The operator committed practices cite under 2.2.1.4 could have some impact at reducing the runoff and erosion rates discussed under the Proposed Action. WEPP is not sensitive enough to realistically model these differences. However, standard runoff controls could significantly reduce water runoff and associated erosion on disturbed areas and during post reclamation. The practice of timely concurrent reclamation as cited in 2.2.1.3 has the potential to reduce runoff and erosion by half that predicted by WEPP by simply reducing the amount of time that the soil is bare and could also reduce off-site impacts from runoff and erosion.

There are no established thresholds of significance regarding soils and no mitigating measures regarding soils are recommended.

4.5.2 Alternative 2 (Proposed Action with COA's)

Same as 4.5.1 above.

4.5.3 Alternative 3 (No Action)

Under this alternative, no soil impacts are anticipated. Runoff and erosion rates would be the same as those discussed under the affected environment and there would be no impact to soil health.

4.6 Vegetation / Invasive plant species

4.6.1 Alternative 1 (Proposed Action)

4.6.1.1 Vegetation

Native vegetation in all areas to be mined would be removed, along with the suitable topsoil that has established over time. After mining is complete, subsoil and topsoil would be placed back on the surface. If the castback mining proceeds along in a timely manner, the soil biota and other microorganisms associated with healthy, living soil would still be alive to help the newly planted seeds reestablish. If the topsoil was left sitting in a stockpile for more than 5 years, the likelihood that there would be any life left in the soil would be much lower, thus decreasing the ability of the soil to support plant life. The success of the vegetation reclamation depends largely on the timeliness and cleanliness of the topsoil replacement process. Also, future topsoil quality and quantity depends on the establishment of vegetation.

Clearing many acres of land at a time leaves areas open to invasive weed species that establish quickly and flourish in disturbed areas. Speedy revegetation with native plants would be necessary to prevent a non-native weed invasion. Due to the decade-long drought and the saline soils of bentonite areas, revegetation is often a slow process taking anywhere from two to twenty years. Any islands of native vegetation left in the mined area would aid in the spread of native plants throughout the disturbance. Also, when topsoil is replaced quickly, viable native seeds can sometimes still be present to reestablish themselves in the reclaimed areas. If reclamation would not be done correctly, a potentially different plant community could replace the native one. Often, even successful reclamation would result in a change from the existing native plant community for decades.

Impacts of the Proposed Action to vegetation would require mitigation (required by both BLM and LQD), as per the terms of any approved mining and reclamation plan(s) and as presented in the Plan application and any accompanying mitigation measures. According to Wyo-Ben, Inc.'s proposed Reclamation Plan, a vegetative community dominated by native shrubs and grasses would be reestablished over time. Mitigation measures would include use of proper seed mixtures and seeding application rates, to help reestablish vegetation over time, to pre-mine or better conditions. All seed used on public lands would be certified noxious weed-free by laboratory testing and would conform to BLM seed policy IM No. 2006-073; any hay or straw used for check-dam construction or mulching would be certified weed-free. Some reclaimed areas may need to be fenced to exclude livestock from grazing too heavily on new-germinated or established seedlings in these areas. Additional re-vegetation goals include site stabilization, erosion control, and restoration of visual aesthetics.

4.6.1.2 Invasive Species

Noxious weeds are invasive species that may become established on open rangelands, particularly on disturbed sites. They are commonly aggressive plants that compete with native species for space, sunlight, soil moisture, and nutrients. Once established, they may eventually exclude desirable native species. If a seed source is present, noxious weed seeds can be physically transported to new areas by livestock movements, vehicular travel, human foot traffic, waterways, and wildlife movements. Disturbed areas commonly associated with bentonite mining would include open pits, areas occupied by stockpiled material, so-called campsites-equipment parking areas, and areas of road improvements-maintenance. The operator has provided a comprehensive weed management plan as part of their mine and reclamation plan, listed in Section 2 of this EA above, that provides for the monitoring for and control of noxious weeds; and includes the assurance that seed, hay or straw used would be weed free. No mitigation is needed if the operator abides by their weed management plan.

4.6.2 Alternative 2 (Proposed Action with COA's)

4.6.2.1 Vegetation

Same as 4.6.1.1.

4.6.2.2 Invasive Species

Same as 4.6.1.2 above

4.6.3 Alternative 3 (No Action)

4.6.3.1 Vegetation

There would be no effect on vegetation under Alternative I, because the proposed Plan of Operation mining would not be approved.

4.6.3.2 Invasive Species

The possibility of noxious weeds being introduced and/or spread through mining related ground disturbing activities and vehicular movement associated with mining and product hauling would no longer exist. However, disturbed areas associated with other land uses may still be present, and the opportunity for noxious weeds to be introduced and/or spread by livestock grazing, vehicular travel, waterways, wildlife movements, and other human influences would still exist in and around the proposed mining areas.

4.7 Livestock Grazing

4.7.1 Alternative 1 (Proposed Action)

Red Springs Allotment in the vicinity of proposed pits 73T, 75T, 98T and 104T:

The Proposed Action would temporarily affect rangelands in the proposed mining areas in Red Springs. Reclamation could be successful if proper topsoil handling and drought do not make it exceptionally difficult for seedlings to germinate and grow. Once the reseeding is successful, the vegetation would be reestablished well enough to provide forage for wildlife and livestock.

Usually reclaimed mining areas are not fenced out of grazing allotments. Because of this, cattle are rarely prevented from grazing on reclaimed lands where seeds are trying to germinate and establish themselves. This can be detrimental to both the grazing and the mining effort. Grazing before plants have established stresses seedlings and makes it very difficult for them to survive, spread, or create healthy rangeland. Grazing during the early stages of revegetation can lead to an increase of weed growth; native seeds in the seed mix are more desirable to cattle and are quickly grazed off, leaving the barren area to be established by weeds.

Wyo-Ben, Inc. would be responsible for successful reseeding - revegetation and would be held accountable for the reseeding - revegetation by WDEQ-LQD and the BLM until an acceptable vegetative community has established.

Livestock would be present during portions of the mining activity. It is not expected that the activity would affect the livestock and prevent them from grazing. Approximately 69 acres involving 14 Animal Unit Months (AUM) would be removed over the life of the project. These AUMs would be available for livestock after the project area has been successfully re-seeded.

Allotments in the vicinity of the proposed 108T pit.

The proposed 108T pit would affect approximately 5 acres of the Shumway allotment, 75 acres of the South Owl Creek allotment and 25 of the Plummer allotment. Based upon the approximate affected acres the Shumway Allotment would lose 1 Animal Unit Month (AUM) annually for the life of the project, the South Owl Creek would lose 8 AUMs annually for the life of the project and the Plummer would lose 5 AUMs annually for the life of the project-through reclamation.

Allotments in the vicinity of the proposed 102T pit.

The proposed pit would affect approximately 2 acres of the South Coal Draw allotment and 19 acres of the Steer allotment. Based upon the approximate affected acres the South Coal Draw Allotment would lose 1 Animal Unit Month (AUM) annually for the life of the project and the Steer would lose 3 AUMs annually for the life of the project.

Rangeland fences at the 102T and 108T proposed pit locations.

As proposed, mining at the proposed 108T pit would partially remove a fence between the Plummer and South Owl Creek Allotment and would also partially remove a fence between the South Owl Creek and the Plummer Allotment, see Figure R1. As proposed, mining at the proposed 102T pit would remove part of the fence between the South Coal Draw and Steer allotments. Without these fences orderly management cannot occur on the allotments. As part of mitigation, a fence would have to be built for the life of the project around the west and southern parts of the proposed 108T pit (see Figure R1) and around the northeasterly part of the 102T pit (see Figure R2). The operator would be required to erect a fence around the remainder of the pit soon after mining ceases so as to preclude livestock grazing. That fence would remain in place until reclamation is found to be to the satisfaction of the BLM and Wyoming DEQ, including the establishment of a plant community that is sufficiently similar to the native one that exists now so that stocking rates would be at pre-disturbance levels. At such time, the operator would realign the rangeland fences to their pre-mining configuration.

4.7.2 Alternative 2 (Proposed Action with COA's)

Same as 4.7.1., except that the range allotments would remain separated and the revegetation at the 102T and 108T proposed pits would avoid being impacted by grazing.

4.7.3 Alternative 3 (No Action)

There would be no effect on livestock, grazing under Alternative I, except that that cattle grazing would not have to halt for the proposed mining disturbance, and the forage would not change to post-mining species.

4.8 Wildlife

4.8.1 Alternative 1 (Proposed Action)

Seasonal and year-long use of the area by large ungulates such as elk, mule deer, and antelope would likely be altered during periods of increased vehicular traffic and operation of heavy equipment associated with the mining activity. These animals would likely be displaced to adjacent areas where suitable habitat exists. A period of non-use by these species may occur as a result of mining areas being void of vegetation until revegetation takes place. Numerous small mammals, predators, passerines, and reptiles which may be present would likely move to adjacent areas where suitable habitat is found.

4.8.2 Alternative 2 (Proposed Action with COA's)

Same as 4.8.1 above in the absence of any specific COA's stated.

4.8.3 Alternative 3 (No Action)

Alternative 3 would not add to the effects that already exist in the area because the proposed bentonite mining would not take place.

4.9 Threatened, Endangered, Candidate, and BLM Sensitive Species – Plants and Wildlife

4.9.1 Threatened, Endangered, Candidate, and BLM Sensitive Species - Plants

4.9.1.1 Alternative 1 (Proposed Action)

None present; therefore none would be affected.

4.9.1.2 Alternative 2 (Proposed Action with COA's)

Same as 4.9.1.1

4.9.1.3 Alternative 3 (No Action)

No effect.

4.9.2 Threatened, Endangered, Candidate, and BLM Sensitive Species - Wildlife

4.9.2.1 Alternative 1 (Proposed Action)

Breeding, nesting, and early brood-rearing activities by greater sage-grouse in project areas may be displaced or altered as a result of removal of vegetation and soil or by operation of mining equipment. This species would likely move to adjacent areas where suitable habitat for these activities exists. Various raptors nesting in the area may be disturbed by activity associated with the operation of mining equipment during their nesting period.

4.9.2.2 Alternative 2 (Proposed Action with COA's)

Same as 4.9.2.1 above in the absence of any specific COA's stated.

4.9.2.3 Alternative 3 (No Action)

Alternative 3 would not add to the effects that already exist in the area because the proposed bentonite mining would not take place.

4.10 Recreation and Visual Resources

4.10.1 Alternative 1 (Proposed Action)

4.10.1.1 Recreation

The project areas would alter the current recreational settings to a more urbanized setting, which may interfere with beneficial outcomes and experiences sought for by visitors who enjoy recreating in these areas. The goal interferences would result in unrealized benefits and experiences, which would displace users to alternative areas. User conflicts may increase between visitors and work related activities, visitor safety may be compromised by mining activities, most notably by the increase in traffic on the access roads. Through adequate safety signing, avoiding restricted access to public lands, and maintaining the projects to a level of subordinance against the surrounding visual elements of form, line, color, and texture, impacts to recreation could be minimized.

4.10.1.2 Visual Resource Management

The proposed projects would impact the scenic qualities during the life of the project. The projects would meet the visual resource management (VRM) Class III, and IV objectives, but may conflict with Class II objectives. The projects would introduce contrasting elements of form, line, color, and texture against the surrounding natural elements, which would interfere with or distract the casual observer's viewshed. However, the size and the phased

approach of the projects would not conflict with VRM Class III and IV objectives. 108T is located on BLM-administered public lands managed as VRM Class II.

On April 8, 2009, a visual contrast rating worksheet was completed to assess the visual impacts from the 108T pit. U.S. Highway 120 was used as the Key Observation Point, and a pull off near the intersection of U.S. Highway 120 and WY Route 170 was used as the photo point to inventory the viewshed of the proposed action. The degree of contrast rated from high to weak. Refer to the following table:

Degree of Contrast from Visual Contrast Rating Worksheet – 4/8/2009

Degree of Contrast	Land/Water Body				Vegetation				Structures			
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Form												
Line												
Color												
Texture												

The proposed project (108T) would introduce contrasting elements of form, line, and most especially color against the surrounding natural elements. This contrast would be evident from the south bound travelers on U.S. Highway 120, and from the residents of the area. The stock piling and the pits would introduce contrasting elements of (white) color, (blocky polygons) form, and (straight and angular) line. 108T is located on the slope which would display the project footprint to casual observers. The project, without any appropriate COA's to mitigate for VRM Class II, would introduce a high degree of contrasting elements against the natural elements beyond Class II thresholds, which would not meet the objectives of this class.

However, the project would be completed in a phased manner lasting approximately 15 years. This phased approach would minimize the contrasting elements. Situations such as poor reclamation, or slow bentonite excavation could impact visual resources for the long term. The bentonite would be allowed to dry in a pre-existing drying pad area which is out of the viewshed from U.S. Highway 120. This off-site work would minimize contrasting elements of color. Without further site-specific mitigation so as to maintain a subordinate level of visual contrast, the 108T project may exceed VRM Class II objectives.

4.10.2 Alternative 2 (Proposed Action with COA's)

4.10.2.1 Recreation

Impacts to recreation would be the same as Alternative 1.

4.10.2.2 Visual Resource Management

The impacts to visual resources would be the same as Alternative 1, with the exception of suggested mitigations so as to minimize the visual contrasts of the proposed mine project (108T). Visual Resource Management mitigation is **suggested** mitigation for 43 CFR 3809 activities. **Suggested** mitigation may keep the contrasting elements of line, form, color, and texture from the proposed (108T) mine pit at a subordinate level, which is within VRM Class II objectives. The following mitigations are **suggested** so as to maintain a minimum level of contrast.

The excavated Bentonite material will be moved to the existing pit location (T.42N., R.95W., Sec 25, NESE) for field drying. Use of mine pit areas for bentonite drying shall be kept to a minimum, in order that bentonite pits can be backfilled, recontoured and reseeded in a timely manner (within 2-3 years), and to maximize live-spreading of topsoil and reclamation success.

Pits will be reclaimed immediately following bentonite excavation. Reclamation of disturbed lands shall be

concurrent with mining as much as possible during the life of the WyoBen claims mine. Mined areas shall be recontoured to blend in with the adjacent surroundings and support similar vegetation, with a minimum of highwall reduction, out-of-pit spoil piling, and associated disturbance of adjacent native areas. Highwall reduction and related disturbance of native vegetation is discouraged. Modifications to the proposed mine plan must be submitted to BLM prior to being implemented on the ground as per the regulations at 43 CFR 3809.

4.10.3 Alternative 3 (No Action)

4.10.3.1 Recreation

4.10.3.2 Visual Resource Management

Visitors to the areas would freely strive to realize their beneficial outcomes with minimum goal interference from mineral development activities. The recreational settings would be maintained in the middle to front country settings. Users would not be displaced to alternative areas due to the no action.

The scenic qualities of the areas would remain undisturbed. There would be no contrasting elements of form, line, color, and texture against the surrounding natural elements. There would be no impacts to visual resource management under Alternative 3.

4.11 Cultural and Historical Resources

4.11.1 Alternative 1 (Proposed Action)

A Class III cultural inventory was conducted of the proposed project area. No historic properties will be affected by the proposed project. The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If paleontological, historical or archaeological materials are uncovered during operations, the operator is to immediately stop work that might further disturb such materials, and contact the authorized officer (AO).

Within ten (10) working days the AO will evaluate the discoveries and take necessary actions to protect or remove the resource. Decisions regarding the appropriate measures to mitigate effects to such resources will be made in consultation with the operator.

4.11.2 Alternative 2 (Proposed Action with COA's)

Same as 4.11.1

4.11.3 Alternative 3 (No Action)

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

4.12 Socioeconomics and Environmental Justice

4.12.1 Alternative 1 (Proposed Action)

The approval of a plan of operation would mean that mining as a contributor to earnings by place of work would likely continue as the largest contributor to personal income in Hot Springs County. The mined bentonite would provide feed for a processing plant at Lucerne, Wyoming, located about seven miles north-northeast of Thermopolis (see Figure 1) near the junction of U.S. Route 20 and State Route 72, also called the Black Mountain Road. That plant is being renovated in advance of its planned reopening in mid-June or July of 2009. This mined bentonite would create an export of manufactured goods from Hot Springs County, which in 2007 had no reportable exports of manufactured goods (US Census Bureau, 2009). There would be employment opportunities for the local population as plant workers, equipment operators and truck drivers. The economy of the area would also be beneficially affected by local purchases made the workers, operators and drivers, the utilization of local merchants to supply fuel and parts and to provide maintenance and repair of equipment and buildings. Creation of employment is viewed as crucial to Hot Springs County which sees the population as aging in place, and the income to the County would help to support local services.

4.12.2 Alternative 2 (Proposed Action with COA's)

Same as 4.11.1

4.12.3 Alternative 3 (No Action)

The denial of the plan of operation would have an adverse affect on the economy of Hot Springs County. The Lucerne processing plant may not be able to operate at capacity with feed of raw bentonite from only two pits within the County. This would result in the idling of the plant and those employed there, as well as the equipment operators who conduct mining at the existing pits and the drivers who haul raw bentonite from those pits to the Lucerne Plant when the supply from existing sources in County are mined-out. The County would remain reliant on a not so diverse economy that is based mostly on tourism, oil and gas operations, health care, and agriculture.

4.13 Hazardous Materials; Public Health and Safety

4.13.1 Alternative 1 (Proposed Action)

The spill management plan appears to be sufficient to address the handling of releases of fuels, lubricants, antifreeze, and battery acids. However, the plan is not explicit regarding the handling of spills of more than 25 gallons. As a COA, when the operator contacts the BLM regarding such a release, information about where the spilled fluid and the contaminated ground would be disposed of or treated would be disclosed by the operator.

The operator does not disclose information about vehicular speed when the use of existing roads is discussed under 2.2.1.1 above. Since existing dirt roads and roads that would be upgraded and maintained are functionally classified as resource roads, a speed limit of 30 mph is to be observed as a COA.

4.13.2 Alternative 2 (Proposed Action with COA's)

Accidental releases would be adequately remediated and the safety of other drivers on existing dirt roads would be mitigated by mine workers, drivers of bentonite hauling vehicles and drivers of other support vehicles observing a 30 mph speed limit on dirt roads.

4.13.3 Alternative 3 (No Action)

If the plan were denied, there would be no potential for the release of fuels, lubricants, antifreeze, and battery acid from equipment that would be used in mining, reclamation and hauling-transport.

4.14 Paleontology

4.14.1 Alternative 1 (Proposed Action)

The project area is located in geological formations with moderate sensitivity for paleontological resources. A paleontological inventory is not required in advance. The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing paleontological localities, or for collecting vertebrate fossils. If paleontological, historical or archaeological materials are uncovered during operations, the operator is to immediately stop work that might further disturb such materials, and contact the authorized officer (AO).

Within ten (10) working days the AO will evaluate the discoveries and take necessary actions to protect or remove the resource. Decisions regarding the appropriate measures to mitigate effects to such resources will be made in consultation with the operator.

4.14.2 Alternative 2 (Proposed Action with COA's)

Same as 4.14.1

4.14.3 Alternative 3 (No Action)

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

4.15 Cumulative Impacts

The area considered for cumulative impact analysis include the lands within Hot Springs County that within and one mile out from Wyoming DEQ-LQD mine permit 321C, as well as sections encompassing existing and proposed haul roads.

Not all lands within the DEQ designated mine permit boundary within Hot Springs County would be disturbed by bentonite mining due to the topography of the area, as well as the dip angle of the sedimentary formations, quality, and thickness the individual bentonite beds that occur in these areas. Mine permit boundaries are established for administrative purposes and are polygonal areas bounding the general area of interest to the mining company.

Bentonite mining has taken place within the boundaries of the cumulative affects analysis area. On Figure 11 reclaimed mine areas that have been released from bonding by the Wyoming DEQ are shown in a green. These areas amount to about 210 acres. Areas of mining that have undergone interim stabilization and are pending reclamation when the nearby proposed mining is completed are shown in blue-green color. These areas occupy about 168 acres. Bentonite mining is occurring at pit 127T (brown colored area on cumulative affects Figure 11) under BLM plan of operation WYW126215. That mine area would ultimately encompass about 25 acres and there is an associated haul road to that pit encompassing about 22 acres. A pit that is about mined-out (101T) and a nearby bentonite stockpiling-drying pad occur in the vicinity of proposed pit 108T (brown areas on Figure 11).

The operator is conducting bentonite exploration under surface management notice WYW165046 within many of the 321C mine permit blocks shown on Figure 11. The operator is actively gathering baseline data and may submit a plan to mine bentonite within the two mine permit blocks pointed to on Figure 11 and may apply to modify the mine plan for pit 101T (lower area pointed to on Figure 11) to expand it to the northwest within the foreseeable future.

Other past, present and reasonably foreseeable land uses within the cumulative affects analysis area include livestock grazing, maintenance of rangeland facilities such as fences to separate pastures; ranching and farming on private lands; oil and gas drilling and production on leases and within designated fields; utilization of existing paved and dirt roads by residents, recreationists, hunters-fisherman and industry; the transportation of petroleum products via buried pipelines; and electric power transmission and telephone-cable communications via overhead lines. The latter three usually involve rights-of-way (ROW's) on BLM administered lands. Major ROW corridors established under the existing Grass Creek and Washakie Resource Management Plans are depicted as green shaded areas on Figure 12. There is a variety of pipelines and overhead power-communication lines in each of those corridors, most of which were granted many years ago (for more site specific information about ROW grants, see master title plat information available at Wyoming BLM's website http://www.blm.gov/wy/st/en/resources/public_room/mtps.html).

Based on the foregoing, the following resources have been, are and may be directly affected by past, present, and reasonably foreseeable development within the cumulative affects analysis areas.

Air Quality – There is no active air quality monitoring transpiring within the cumulative affects area. Moderate incremental increases in pollutant concentrations are allowed in this PSD Class II area. The air quality within the cumulative affects area should be comparable to the background concentrations for the Bighorn Basin and, therefore, would be remain in compliance with Wyoming and National ambient air quality standards for critical air pollutants as listed in Table 3. The operator has obtained an air quality permit for the operation of the bentonite processing plant at Lucerne and the mining of bentonite within the Bighorn Basin has not been subjected to air quality permitting by the Air Quality Division of the Wyoming DEQ.

Water Quality- The current conditions of the Kirby Creek Watershed and its listing on the WY DEQ 2008 303d list is indicative of the current water quality conditions. The continuation of surface disturbing activities such as the creation of new haul roads have impacted watershed in the past and its impacts would continue in the foreseeable future.

Socioeconomics – There are no socio-economic forecasts for the Bighorn Basin within the Analysis of the

Management Situation summary for the Bighorn Basin Resource Management Plan revision. However, the continuation of bentonite mining operations into the reasonably foreseeable future may result in a beneficial impact to the Hot Springs County area that is not quantifiable.

Environmental justice – There are no forecasts regarding social conditions, including minority and low income populations within the Bighorn Basin Analysis of the Management Situation summary for the Bighorn Basin Resource Management Plan revision.

Invasive plant species - The national system of public lands would continue to be monitored for the presence of noxious weeds, as per the Bighorn Basin Weed Management Plan, and treatment methods for any existing or new noxious weed infestations located would be evaluated on a site specific basis.

Wildlife – At the present scale, the land area affected by the mining project and indicated by the cumulative effects delineation, displacement of various wildlife species to adjacent areas as a result of mining activity is not likely to have negative cumulative effects over the anticipated life of the project. Displaced wildlife species normally adapt to changing conditions and resume activity in adjacent areas where suitable habitat is found. In the event that future potentially wildlife displacing activities are considered near these project areas, additional consideration should be given to the fact that wildlife has already been displaced and an evaluation of the land area and habitat required for various wildlife species should be conducted.

Recreation - Continual mining development in areas with legal public access which are popular for dispersed recreational opportunities would alter the settings to an urban and industrialized setting, which would interfere with visitors' beneficial outcomes. Most dispersed recreationists enjoy the natural settings and the benefits that can be obtained from those natural settings. The alteration of the recreational settings to an urban and industrialized setting conflicts with recreationists' desired settings which are essential in obtaining desired outcomes. This conflict would create personal, community, environmental, and possibly economic non-beneficial outcomes, as well displace community and regional visitors to alternative areas. Site specific mitigation measures can be applied to individual projects so as to minimize the impacts to recreation, but the settings, and the benefits, and experiences desired by the recreationists in these settings would be compromised. Reestablishment of a desirable vegetative cover and reshaping of the land to approximate pre-mining/development contour as part of reclamation would help restore the national system of public lands within the cumulative affects area to an environment future recreationists may find unobtrusive.

Visual Resource Management - Continual mining development would impact the scenic qualities of the area. The visual impacts would degrade the viewsheds to the degree where a lower Visual Resource Management Class objective must be prescribed. Maintaining scenic qualities over a landscape under a lower VRM objective is difficult and nearly unachievable. The unique scenic qualities enjoyed in the Bighorn Basin would be compromised by introducing the unnatural conflicting elements of form, line, color, and texture; as well as the inability to maintain visual resources on BLM-administered public lands. Through site specific mitigation measures, contrasting elements from development could be minimized, but not to the standard of the VRM Class II objectives.

Cultural Resource Management - Continual mining development could impact the air quality to the extent that dust deposits accumulate on petroglyphs which is an adverse effect in extreme cases. Base line data on current air quality with regard to dust and other particulate matter should be collected to allow future evaluations of cumulative effects. The BLM has started to collect base line data on the presence of dust and other particulate material on petroglyphs near the proposed mine areas. The visual and acoustic setting of sites, important for their religious and cultural use by contemporary people, could be compromised by extensive activities.

Figure 11. Cumulative affects analysis area.

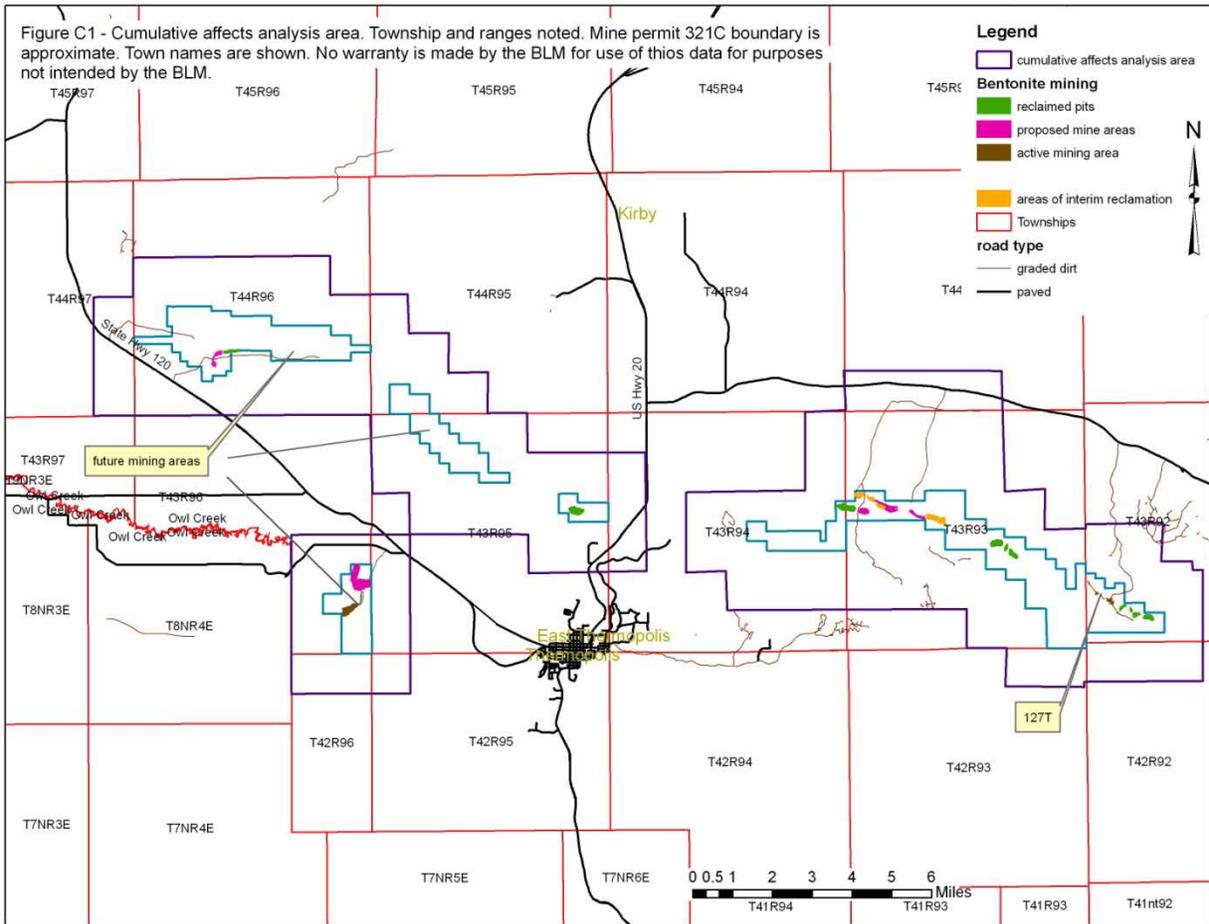
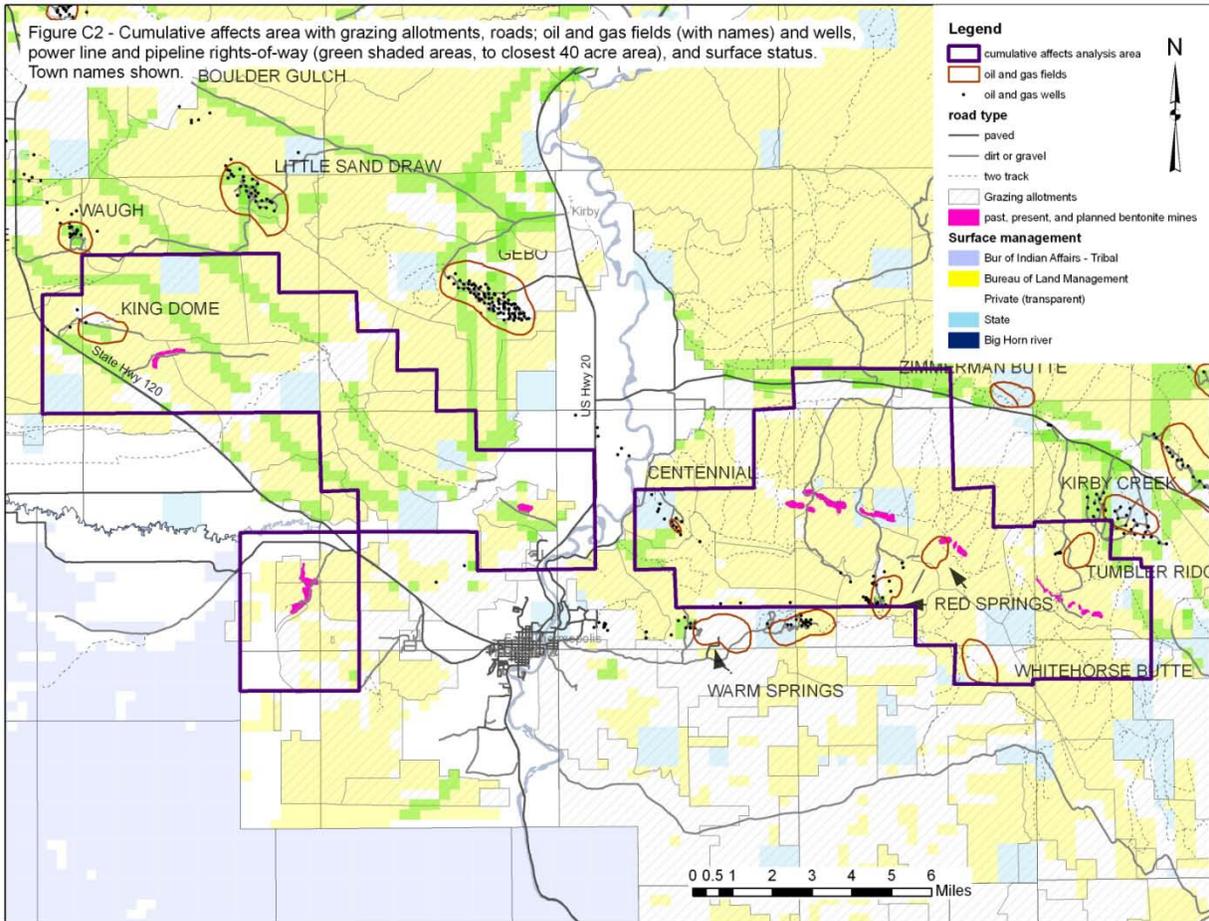


Figure 12. Cumulative affects analysis area with grazing allotments, roads, oil and gas fields, wells, power line and pipeline rights-of-way.



4.15 Residual Impacts

None identified

5.0 Consultation and Coordination

5.1 List of Preparers

Name	Title
Mike Bies	Archaeologist
Marit Bovee	Archaeologist
Pete Sokolosky	Geologist
Marilyn Wegweiser	Geologist
Ted Igleheart	Wildlife Biologist
Paul Rau	Recreation Specialist
John Elliott	Range Management Specialist
Monica Goepferd	Civil Engineer
Carol Sheaff	Realty Specialist
Karen Hepp	T & E Plant Specialist / Range Management Specialist
Steve Kiracofe	Soil Scientist / Hazmat Coordinator
Rance Neighbors	Noxious Weeds Coordinator

5.2 Persons/Agencies Consulted

Air Quality Division, Wyoming Dept of Environmental Quality, Cheyenne and Lander Offices
Hot Springs County Planner, Thermopolis, WY

Land Quality Division, Wyoming Dept. of Environmental Quality, Lander District Office
Wyoming State Office, Bureau of Land Management

6.0 References

- BLM, 2009, Summary of the Analysis of the Management Situation for the Bighorn Basin Resource Management Plan Revision project; Cody and Worland Field Offices, Wyoming, pp. 2-1 – 2-9.
- U.S. Census Bureau, 2009, Hot Springs County QuickFacts; <http://quickfacts.census.gov/qfd/states/56/56017.html>, Washington, DC
- State of Wyoming, 2008, Wyoming Ambient Air Monitoring Annual Network Plan 2008; Dept. of Environmental Quality, 35 pp., Cheyenne, WY.

Conditions of Approval

- Vehicles hauling bentonite or which are transporting personnel and materials to and from the locations of mining shall observe a 30 mph speed limit on all dirt roads.
- As part of the notification process, the operator shall inform the BLM how spills of more than 25 gallons and ground contaminated by such a spills would be disposed of or treated.
- To provide for the orderly separation of range allotments, the operator must relocate the existing rangeland fencelines that cross portions of proposed pits 102T and 108T (see Figures 9 and 10) during the life of mining and reclamation activities. Following the cessation of mining operations and final reshaping and initial seeding of the final phase of mining at pits 102T and 108T, the operator shall install a fenceline about the remainder of each pit area. The operator may remove the latter fence when reclamation is determined to be to the satisfaction of the BLM and Wyoming DEQ, while re-establishing the alignment of the original rangeland fences.
- Regarding proposed pit 108T, the excavated bentonite material will be moved to the existing pad area in T.42N., R.95W., Sec 25, NESE for field drying. Use of mine pit areas for bentonite drying shall be kept to a minimum, in order that bentonite pits can be backfilled, recontoured and reseeded in a timely manner (within 2-3 years), and to maximize live-spreading of topsoil and reclamation success. Pits will be reclaimed immediately following bentonite excavation. Reclamation of disturbed lands shall be concurrent with mining as much as possible during the life of the 108T pit area. This mined area shall be recontoured to blend in with the adjacent surroundings and support similar vegetation, with a minimum of highwall reduction, out-of-pit spoil piling, and associated disturbance of adjacent native areas. Highwall reduction and related disturbance of native vegetation is discouraged. Modifications to the proposed mine plan must be submitted to BLM prior to being implemented on the ground as per the regulations at 43 CFR 3809.
- The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic, archaeological sites or paleontological localities, or for collecting artifacts or vertebrate fossils. If paleontological, historical or archaeological materials are uncovered during operations, the operator is to immediately stop work that might further disturb such materials, and contact the authorized officer (AO). Within ten (10) working days the AO will evaluate the discoveries and take necessary actions to protect or remove the resource. Decisions regarding the appropriate measures to mitigate effects to such resources will be made in consultation with the operator.