

Environmental Assessment

Bruce Claims #2, #3, and #5

BLM

Worldland Field Office, Wind River/Bighorn Basin District, Wyoming

APRIL 2012



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

DOI-BLM-WY-R010-2011-0053-EA

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Project Title: Bruce Claims #2, #3, and #5
 NEPA Number: DOI-BLM-WY-R010-2011-0053-EA
 Project Type: Bentonite Mining Plan of Operations

Location:

Name of Affected Mining Claims, Millsites, or Tunnel Claim(s), Serial Number(s), and WMC Numbers If Applicable:

Claim Name	Serial Number	Legal Description	Section Township Range	Acres
Bruce #2	WMC297256	NE $\frac{1}{4}$ Lot #16	Section 18, T.47N., R.89W.	10.0
Bruce #3	WMC297257	SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$	Section 18, T.47N., R.89W.	10.0
Bruce #5	WMC297259	NE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ W $\frac{1}{2}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$	Section 19, T.47N., R.89W.	40.0
Bruce #5	WMC297259	NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$	Section 20, T.47N., R.89W.	10.0

Name and Location of Preparing Office:

Worland Field Office
 101 S. 23rd St.
 Worland, WY 82401

Case File Number: WYW165224

Applicant/Address:

Black Hills Bentonite
 Mills, WY

1 INTRODUCTION

1.1 Background Information

This Environmental Assessment (EA) has been prepared to disclose and analyze the environmental consequences of the BRUCE CLAIMS 2, 3, AND 5 MINE PLAN OF OPERATIONS UPDATE TO WYOMING MINING PERMIT 218C-7 as proposed by Black Hills Bentonite, Inc. The EA is a site-specific analysis of potential impacts that could result with the implementation of a proposed action or alternatives to the proposed action.

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

The EA assists the BLM in project planning and ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any “significant” impacts could result from the analyzed actions. “Significance” is defined by NEPA and is found in regulation 40 CFR 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of “Finding of No Significant Impact” (FONSI). If the decision maker determines that this project has “significant” impacts following the analysis in the EA, then an EIS would be prepared for the project. If not, a Decision Record may be signed for the EA approving the selected alternative, whether the proposed action or another alternative. A Decision Record (DR), including a FONSI statement, documents the reasons why implementation of the selected alternative would not result in “significant” environmental impacts (effects) beyond those already addressed in the Washakie Resource Management Plan, September, 1988.

1.2 Purpose and Need of the Proposed Action

BLM is considering approval of private exploration and production from federal minerals because the activity is an integral part of BLM’s minerals program under authority of the Mining Law of 1872, as amended. These regulations are issued under the authority of sections 302 and 603 of the Federal Land Policy and Management Act of 1976 (43

U.S.C. 1732, 1733, and 1782). Additionally, mineral exploration and development is recognized as an appropriate use of public lands in the Washakie Resource Management Plan that provides management direction for the leased area. As per §43 CFR 3809.1 the purposes of this subpart are to (a) Prevent unnecessary or undue degradation of public lands by operations authorized by the mining laws. Anyone intending to develop mineral resources on the public lands must prevent unnecessary or undue degradation of the land and reclaim disturbed areas. This subpart establishes procedures and standards to ensure that operators and mining claimants meet this responsibility; and (b) Provide for maximum possible coordination with appropriate State agencies to avoid duplication and to ensure that operators prevent unnecessary or undue degradation of public lands.

Federal public domain lands included in this proposal are managed by the Bureau of Land Management (BLM). These lands are covered by placer mining claims which, under federal law of the General Mining Act of 1872 (as amended), give the applicant, Black Hills Bentonite, Inc., the right of access to extract the minerals claimed and to use the surface of the claim area in as careful and prudent manner as may be necessary to facilitate this extraction. The approval of this Plan of Operations (POO) through the signing of a Finding of No Significant Impact/Decision Record by the BLM, under the terms of §43 CFR 3809, and the Cooperative Agreement between the Bureau and the State of Wyoming, Department of Environmental Quality - Land Quality Division (DEQ-LQD), and the issuance of the Plan Approval letter from BLM, will constitute surface owner consent on those lands.

1.3 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 stipulations or Conditions of Approval could 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.

1.4 Conformance with Land Use Plans

The proposed action conforms to the Record of Decision and Approved Resource Management Plan for the Washakie Resource Area dated 1988, which is under revision and consolidation into the Bighorn Basin Resource Management Plan (expected completion in 2012.) The decisions in the Washakie Resource Management Plan provide general management direction and allocation of uses and resources on the public lands in the area. The Washakie 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.

1.5 Relationship to Statutes, Regulations, or Other Plans

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.

§43 CFR 3809. 2 applies to all operations authorized by the mining laws on public lands where the mineral interest is reserved to the United States, including Stock Raising Homestead lands as provided in §43 CFR 3809.31(d) and (e). When public lands are sold or exchanged under 43 U.S.C. 682(b) (Small Tracts Act), 43 U.S.C. 869 (Recreation and Public Purposes Act), 43 U.S.C. 1713 (sales) or 43 U.S.C. 1716 (exchanges), minerals reserved to the United States continue to be removed from the operation of the mining laws unless a subsequent land-use planning decision expressly restores the land to mineral entry, and BLM publishes a notice to inform the public. This subpart does not apply to private land except as provided in paragraphs (a) and (c) of this section.

Black Hills Bentonite, LLC, is holder of ROW WYW-123121; for this project involving Federal lands and minerals they need no additional ROW. However, when mining begins on the private land/private minerals, then it will be necessary to amend ROW WYW-123121 to add T. 47 N., R. 89 W., sec. 18, NWNE.

1.6 Scoping and Issues Identification

A new bentonite plan of operations was received by the Worland Field Office on April 8, 2011. In accordance with §43 CFR 3809.411 the plan was reviewed and was deemed complete on May 9, 2011. 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).

1.6.1 Public Participation

The public was invited to comment on the proposed project during a Public Review process for 30 days prior to the writing of the EA; beginning April 14, 2011. One comment was received from the public during the 30 day scoping period. The EA was listed on the WFO NEPA Register webpage beginning on April 8, 2011.

1.6.2 Summary of Public Participation

There was one comment received during the public review period. It is as follows:

“I would encourage the BLM to approve this permit for Black Hills Bentonite....
Thank you

1.6.3 Internal Scoping

Internal scoping was conducted in the BLM WFO beginning in April 2011, and concluding in February 2012.

No mine plan revisions were requested during internal scoping. No unusual environmental issues were identified relative to the proposed mine plan.

1.6.4 Issues Identified

Internal scoping resulted primarily in the following BLM specialist concerns:

What would be the impacts from disturbance and associated cheatgrass spreading?
How does the activity displace users? How does the activity impact public health & safety?
What would be the impact of the activity to Sage grouse habitat?
How will surface disturbance alter run-off and associated water quality?
How will surface disturbance and run-off affect riparian/wetland areas?
What is the potential for successful reclamation of the disturbed area?

2 DESCRIPTION OF ALTERNATIVES

2.1 Introduction

The proposed action involves the mining of bentonite in proposed surface mining pit location where Black Hills Bentonite, Inc., the operator, had located placer claim locations within Washakie County (Figure 1) within the 6th Principle Meridian. Table 1 presents information about the proposed pit area. There are existing dirt roads that the operator would maintain to BLM standards or upgrade as needed, that would be used as transportation routes for the mined product that would be hauled to a processing plant in Worland. Additional haul roads are proposed. The 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 WYW165224 which is on file with the Worland Field Office

2.2 Alternative 1 (Proposed Action)

Bruce Claims #2, 3, & 5 would be an open pit bentonite mine of no more than 75 acres excavated in multiple phases using standard bentonite mining techniques and procedures. A pit sequence can take between five to ten years to complete. Mining processes and mitigation measures are detailed in the Plan of Operations and in the Operator Committed Measures.

Table 2.1 Pit locations and total proposed disturbance

Claim Name	Serial Number	Legal Description	Section Township Range	Acres
Bruce #2	WMC297256	NE ¹ / ₄ Lot #16	Section 18, T.47N. R.89W.	10.0
Bruce #3	WMC297257	SW ¹ / ₄ SW ¹ / ₄ SE ¹ / ₄	Section 18, T.47N. R.89W.	10.0
Bruce #5	WMC297259	NE ¹ / ₄ NW ¹ / ₄ NE ¹ / ₄ W ¹ / ₂ NE ¹ / ₄ NE ¹ / ₄ NE ¹ / ₄ NE ¹ / ₄ NE ¹ / ₄	Section 19, T.47N. R.89W.	40.0
Bruce #5	WMC297259	NW ¹ / ₄ NW ¹ / ₄ NW ¹ / ₄	Section 20, T.47N. R.89W.	10.0

- 1) The extended potential disturbance area allows a little extra room for Black Hills Bentonite, Inc. to be able to expand their pits if the production of bentonite is discovered to be economically advantageous, or if additional stockpile area is needed. This will avoid the use of additional limited time to review paperwork by WDEQ-LQD and BLM for post approval modifications.
- 2) C.O.P. = Contoured Overburden Pile – this area may include overburden stockpile area, temporary bentonite stockpiles, camp site, and will be reclaimed as a permanent contoured overburden area once mining is complete to reflect the surrounding topography.
- 3) T.O.P. = Temporary Overburden Pile – this area may include temporary overburden stockpile area, temporary bentonite stockpiles, camp site, and will be reclaimed similar to the original topography.

Proposed Haul Roads

One new haul road is proposed, as illustrated on Mine Plan Map 1 (E-E'). The disturbance associated with the road would be approximately 2.2 acres. The majority of the proposed haul road lies within the Bruce #3 pit disturbance.

Summary of Proposed Disturbance

Total Proposed Pit Disturbance	25 Acres
Potential Disturbance Area	50 Acres
Total Proposed Haul Road Disturbance (included in pit disturbance)	2.2 Acres
Total Proposed Disturbance Area	77.2 Acres

This Plan of Operation (POO) is submitted in conjunction with seventy (70) acres of Bureau of Land Management (BLM) administered land within Wyoming Department of Environmental Quality – Land Quality Division (LQD) Permit to Mine No. 281C – Update No. 10 (281C-U10) where Black Hills Bentonite proposes to mine bentonite from approximately 7.6 pit acres, and an additional 5.8 acres may be affected by the placement of roads, overburden

stockpiles and topsoil stockpiles. A total of 13.4 acres may be disturbed under this Plan of Operations (POO). These disturbances are illustrated and described in more detail in the Mine Plan section of this submittal. The legal descriptions of the lands in this POO correspond to the lands listed for the Bruce #2, 3 and 5 claims in table above.

Additional BLM administered lands lie on the northeast side of the 281C-U10 area. However, no surface disturbing activities are proposed for these lands. Therefore, these lands in the S $\frac{1}{2}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ and NE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 18, T.47N. R.89WW are not included in this POO.

BHB has submitted to LQD Permit 281C-U10. These lands, which are located within the boundaries of an existing non-coal conversion permit (281C), are being “updated” (Update Area No. 10) prior to the initiation of new mining activities in accordance with the requirements set forth by Chapter 13 of the Wyoming –LQD Rules and Regulations.

Mining Claims

Black Hills Bentonite’s right to mine these federal lands is through the issuance of the above described mining claims issued to Thomas A. Thorson, et. al. These claims and the 281C-U10 boundary are illustrated on Map L-1 (Figure 2) and have been leased to Black Hills Bentonite, L.L.C.

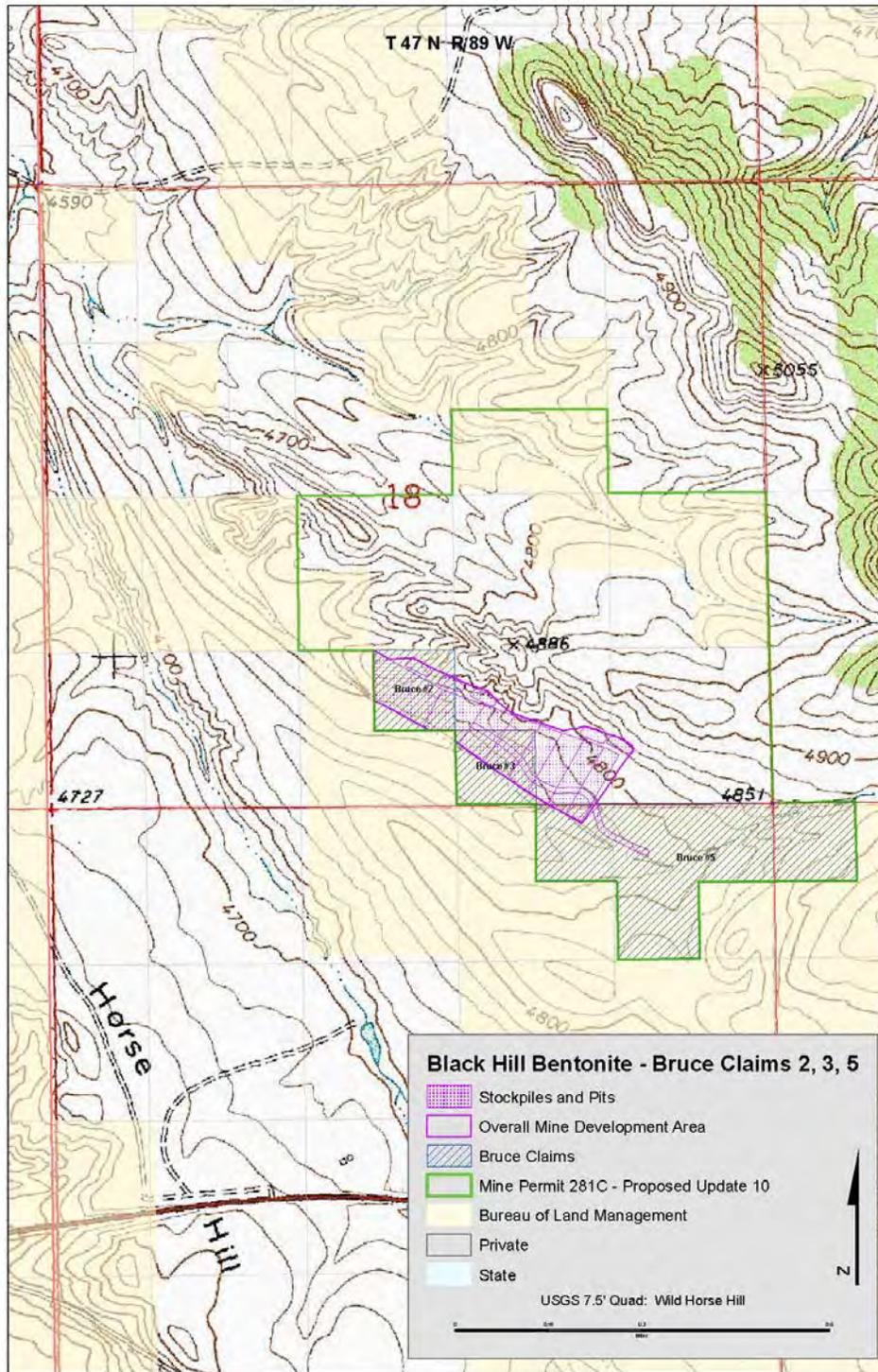


Figure 1. General location of the proposed bentonite mine areas.

2.2.1 MINE PLAN

This Plan of Operation (POO) is submitted for seventy (70) acres of land within WDEQ Permit to Mine No. 281C – Update No. 10 (281C-U10) managed by the Bureau of Land Management (BLM) where Black Hills Bentonite (BHB) proposes to mine bentonite from approximately 7.6 pit acres. An additional 5.8 acres may be affected by the placement of roads, overburden stockpiles and topsoil stockpiles. A total of 13.4 acres are proposed for mine disturbances under this POO. An additional 11.3 acres will be disturbed on patented lands adjacent to the acreage included in this POO. A total of 24.7 acres will be disturbed on this POO and adjacent patented lands. These disturbances are described on Mine Plan Map No. 1 as Mine Disturbance Area #18-2.

The following discussion incorporates all proposed activities on Mine Disturbance Area #18-2 on both the patented land and the lands administered by the BLM. These disturbances are described in more detail in this section of submittal and are illustrated on Mine Plan Map No. 1.

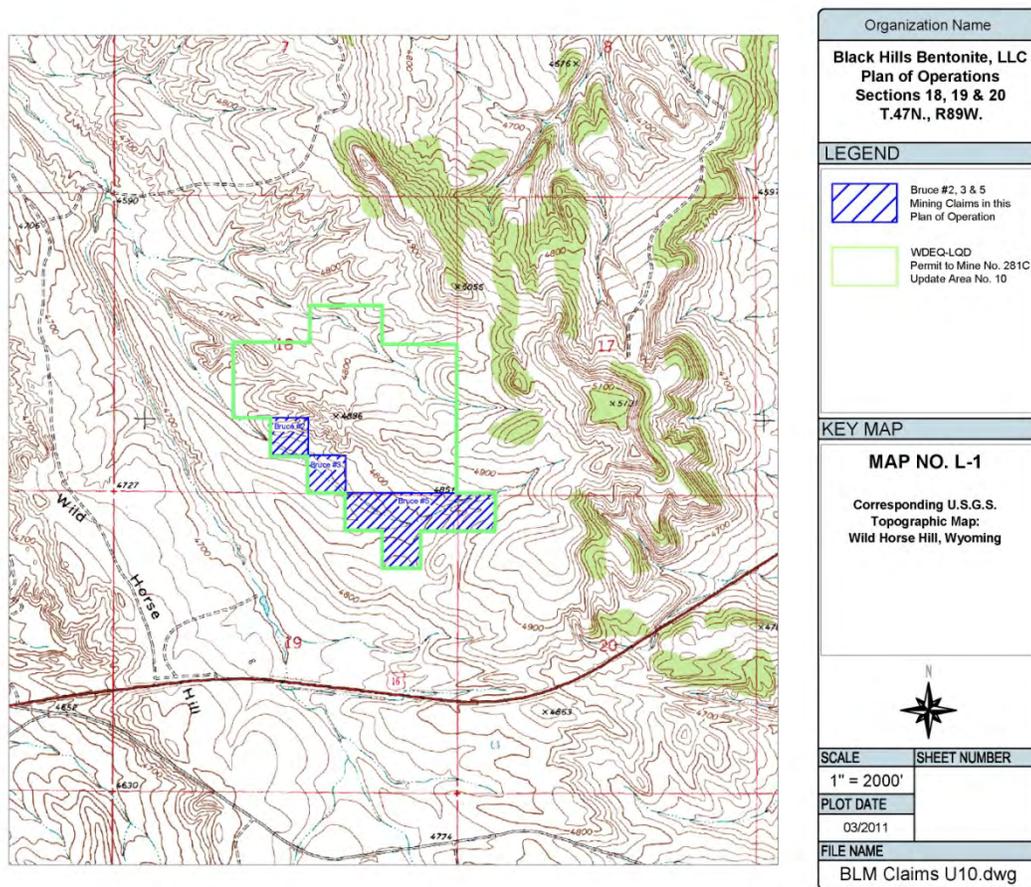


Figure 2. Mine plan map 1 (Map L-1).

2.2.1.1 Type of Mining Activities

Mining will consist of small, open pit surface activities associated with the removal of bentonite.

2.2.1.2 Life of Mining Activities

The life of the mining operation, including reclamation activities, is expected to last approximately ten (10) years. Bentonite will be mined from approximately 17.5 acres. Approximately 7.2 additional acres will be disturbed by related mine disturbances such as topsoil stockpiles, segregated overburden stockpiles, an access road and an overburden stockpile area.

Mining on the area will begin within one year of the approval of the POO. The locations and sequence of proposed mining activities are illustrated on Mine Plan Map No. 1.

2.2.1.3 Heavy Equipment

Mining and reclamation will be conducted using the following equipment:

- Caterpillar 627F Push-Pull Scrapers
- Caterpillar D8R Dozers
- Caterpillar 966 Front-End Loaders
- Caterpillar 14H Motor Graders
- John Deere 7810 Tractor
- Chisel Plows - Grain Drills

2.2.1.4 Type of Bentonite Mined

The bentonite mined on this POO area consists of the "Double Bed" within the Mowry Shale. The upper bentonite layer within the Double bed is usually about 28 inches thick. This bed is separated from the lower bentonite layer by approximately one foot of hard shale. The lower bentonite layer within the Double bed averages 36 inches in thickness.

2.2.2 Existing Mining Activities

Existing mining activities are located in the immediate vicinity of this POO. Bentonite mining activities have been conducted in the vicinity since the 1970's. There are no underground mines on or adjacent to the proposed POO. No mining activities for other minerals are located in the immediate vicinity.

2.2.2.1 Surface Waters

Surface runoff will be directed around and away from mining activities in order to reduce downstream erosion and sedimentation. Final contouring will be done in order to return the affected lands to the approximate original contour. No springs, seeps, or perennial streams will be affected by the proposed mining activities. No jurisdictional wetlands will be affected by the proposed mining activities.

2.2.2.2 Buildings, Processing Plants or other Facilities

No buildings, processing plants or other facilities will be constructed in conjunction with mining activities on this POO area. The bentonite produced from this area will be transported to Black Hills Bentonite's existing processing facilities located in Worland, Wyoming.

2.2.2.3 Access Roads

Access to the area will be via Black Hills Bentonite's existing mine access road that intersects with Highway 16, approximately nineteen (19) miles east of Worland, Wyoming. One short segment of access road will be developed from the primary mine access road into proposed Mine Development Area #18-2.

2.2.2.4 Culvert Sizing for Ephemeral Drainages

No culvert installations are proposed for the POO area. However, if it becomes necessary to install culverts along the proposed road segment E-E', no culverts less than eighteen inches in diameter will be utilized.

2.2.2.5 Power Transmission Lines, Communication Lines and Pipelines

No power lines or communication lines will be constructed in conjunction with the development of mining activities on the POO area. No power lines or communication lines will be affected by the proposed mining activities.

2.2.2.6 Sedimentation and Treatment Ponds

No sedimentation or treatment ponds will be constructed in conjunction with the mining activities on this POO area.

2.2.2.7 Mill and Tailings Disposal Sites

No mill or tailings disposal sites will be constructed or created in conjunction with the development of mining operations on this area.

2.2.2.8 Drainage Diversions

No permanent drainage diversions are proposed for the project area. Surface flow may be diverted on the up-slope side of pits and other affected areas to prevent accumulation of water in pits, and to prevent down slope sedimentation. The diversion of surface flows will be accomplished by constructing small v-ditches on the up-slope sides of pits and other mine development to divert surface flows away from these areas. These small v-ditches will normally be constructed with a motor grader or a dozer. Topsoil will be removed and stockpiled prior to constructing drainage diversions. If erosion occurs on the diversion areas, rock check dams, straw bales or water bars may be used to stabilize erosion and reduce sedimentation.

2.2.2.9 Solid Waste Disposal

Wastes and trash which will be generated as a result of mining activities will be collected in trash containers and hauled to a municipal landfill for disposal. Trash and other solid waste will not be allowed to accumulate at the site. Used oil from heavy equipment will also be collected and properly disposed of or recycled.

2.2.2.10 Petroleum Products - Storage and Spill Management Procedures

Diesel fuel may be stored on-site at the staging area in a portable fuel tank. This tank will be placed within an earthen berm sufficient to contain 110% of the volume of the tank. If other petroleum products, such as one or five gallon plastic containers of lubricating oil, are stored on-site, they will be stored within the containment berm for the portable fuel tank.

In the event of a spill of diesel fuel or lubricating oils, the spill will immediately be contained in order to minimize the extent of the spilled or leaking material. Containment will be accomplished using either commercially available spill control materials or a containment pit which will be located immediately adjacent to the fuel tank. Once containment is achieved, the mine foreman will notify members of BHB's environmental department of the spill. The cleanup method used will depend on the volume of material spilled. If the volume is small, the spilled material will be picked up with oil sorbent pads or pillows which are stored at the staging area. If the volume is large, the spilled material will be contained by the containment pit. Bentonitic soil will then be added to the spilled material to absorb it. All contaminated material including pads, pillows, or soil will then be transported to an approved facility for proper disposal.

If the spill is greater than twenty-five (25) gallons, the Wyoming Department of Environmental Quality – Water Quality Division (WDEQ/WQD) will be immediately notified of the spill and a written report will be submitted within seven days of the spill to WDEQ/WQD.

2.2.2.11 Railroads and Conveyor Systems

No railroad lines or conveyor systems will be constructed in conjunction with the mining activities associated with this POO area.

2.2.2.12 Overburden and Bentonite Stockpiles

One out-of-pit overburden and bentonite stockpile will be constructed in conjunction with the mining activities conducted on this POO area. Out-of-pit overburden stockpiles are normally only constructed with the overburden removed from the first pit mined in a series of connected pits (multiple cut sequence).

Bentonite stockpiles will be developed in order to field dry the bentonite exposed and removed from each pit. Bentonite stockpiles are usually placed on either the overburden stockpile or the backfilled portion of previously mined pits in order to minimize the disturbance of additional lands.

2.2.2.13 Access Control

Due to the remoteness of the area and limited size of this mining operation, no access control features are planned. Any potential hazards to humans, livestock, or wildlife which may develop will be addressed on a site specific basis using fencing or other methods determined between BLM and Black Hills Bentonite, to be appropriate for the conditions. The mined lands will be completely reclaimed following the completion of mining, which will eliminate potential hazards such as highwalls and open pits.

2.2.2.14 General Mining Methods

Bentonite mining on Mine Development Area #18-2 will consist of seven (7) pits. Topsoil will be removed utilizing scrapers and dozers. Topsoil will be placed in stockpiles for future use in the reclamation of the mined or disturbed lands. In some instances the topsoil may be spread directly onto backfilled, graded and contoured areas instead of being placed in stockpiles.

Following the removal of topsoil, the exposed overburden will be removed with scrapers in order to expose the bentonite. Overburden removed from the first pit will be placed in an out-of-pit overburden stockpile. Overburden removed from the second pit will be directly backfilled into the first pit. Once all the overburden is removed and the bentonite is exposed, the bentonite is field dried in the pit and on out-of-pit bentonite stockpiles.

2.2.2.15 Topsoil Removal and Handling

Topsoil will be salvaged prior to overburden removal or construction activities. Topsoil will be salvaged from the following areas: 1) overburden stockpile areas; 2) pits areas; 3) roads; 4) staging areas, and any other area where it is deemed necessary to remove topsoil in order to protect this resource. Topsoil will be removed in accordance with the recommended topsoil salvage depths presented in the Soils section of this POO application. Estimated topsoil salvage volumes for each mine disturbance are illustrated in Table MP-1. In the event that overburden material is encountered that appears suitable as a topsoil substitute, this material may also be salvaged and stockpiled as segregated overburden at the discretion of the operator.

The removal of topsoil will be accomplished using Caterpillar 627F push-pull scrapers. In some instances where the topography may be too steep for the safe operation of scrapers, topsoil will be removed and stockpiled using Caterpillar D8R dozers. Typically, salvaged topsoil will be placed in stockpiles. If graded and contoured areas exist, the topsoil may be applied directly (live-spread) instead of being stockpiled.

Topsoil will also be removed from the edges of all pits in order to create a topsoil "buffer area." This "buffer" is necessary in order to protect the topsoil resources from the possibility of sloughing of high-walls or low-walls on the edges of pits. These buffer areas also facilitate the safe operation of heavy equipment and complete salvage of topsoil along the edges of advancing multiple cut pit sequences. The buffers will be developed to a maximum width of approximately thirty feet wide, where possible. If a thirty-foot buffer cannot be achieved, a minimum buffer of eight feet or one scraper width will be constructed unless conditions prohibit the safe operation of heavy equipment.

A topsoil buffer of approximately eight (8) feet will also be maintained between overburden stockpiles and native ground. This buffer, where topsoil has been stripped and salvaged, will prevent the contamination of topsoil in the event that overburden materials should slough off the stockpile.

All topsoil stockpiles will be conspicuously identified with signs. Topsoil stockpiles which will remain in place for more than one year will be seeded with the approved permanent (perennial) seed mixture. Seeding of stockpiles will be conducted in the spring or fall, whichever season follows the placement of the stockpile. If a fall seeding with the permanent seed mixture is not possible due to weather or other circumstances, the topsoil stockpiles will be seeded with an annual small grain sterile hybrid such as Quickguard the following spring in order to establish a cover crop. The cover crop will be inter-seeded with the permanent seed mixture in the autumn of the same year.

2.2.2.16 Overburden Handling

Overburden removed from the pit areas will be either stockpiled or directly backfilled into previously mined pits in the advancing pit series. Overburden removed from the first pit in a multiple cut pit series will be placed immediately adjacent to the pit to form an out-of-pit overburden/bentonite stockpile. A portion of this material may be returned to the pit areas to complete backfilling, or in some specific instances, all or a portion of the overburden will remain as a permanent reclamation feature. There will be no over-escarpment spoiling conducted during the course of the mining operations on this amendment area.

Black Hills Bentonite will salvage, at its discretion, a portion of the better quality overburden up to a depth of eighteen (18) inches. This material will be stockpiled, identified and signed as “Segregated Overburden.” Segregated overburden will be spread on top of the backfilled overburden prior to the application of topsoil, in order to create an improved plant root zone as well as a buffer between the topsoil and the overburden.

Waste bentonite, commonly referred to as “cleanings,” which remain after the stockpiled bentonite has been removed, will be disposed of by placing this material at the base of a highwall prior to backfilling. This is done to prevent this highly bentonitic material from being placed directly on the surface prior to the application of topsoil. If a highwall is not available for burying the “cleanings,” an area on the out-of-pit overburden stockpile area will be excavated and the “cleanings” will be buried.

2.2.2.17 Bentonite Handling and “Field-Drying”

The “field-drying” of bentonite is a process which utilizes the radiant heat of the sun to reduce the natural moisture content of the mined bentonite. This “field-drying” procedure reduces the amount of fuels consumed in both the hauling of the material to the processing plant, and in the drying of the bentonite as it is being processed.

During the summer months, the exposed bentonite is plowed using farm tractors and chisel plows. As a plowed layer of bentonite becomes dried by the sun and wind, this dried layer is removed with scrapers and placed in a stockpile. The plowing process in the pit is then repeated until the entire seam of exposed bentonite is eventually dried, removed from the pit, and stockpiled.

“Field-dried” bentonite is loaded from the stockpiles into twenty-five (25) and thirty-five (35) ton belly-dump trucks, and hauled to the BHB processing plant in Worland for processing.

2.2.2.18 Mining Sequence

The locations and sequence of proposed mining activities are illustrated on the Mine Development Map No. 1 (Figure 3). Mining activities will commence within one year of the approval of this POO.

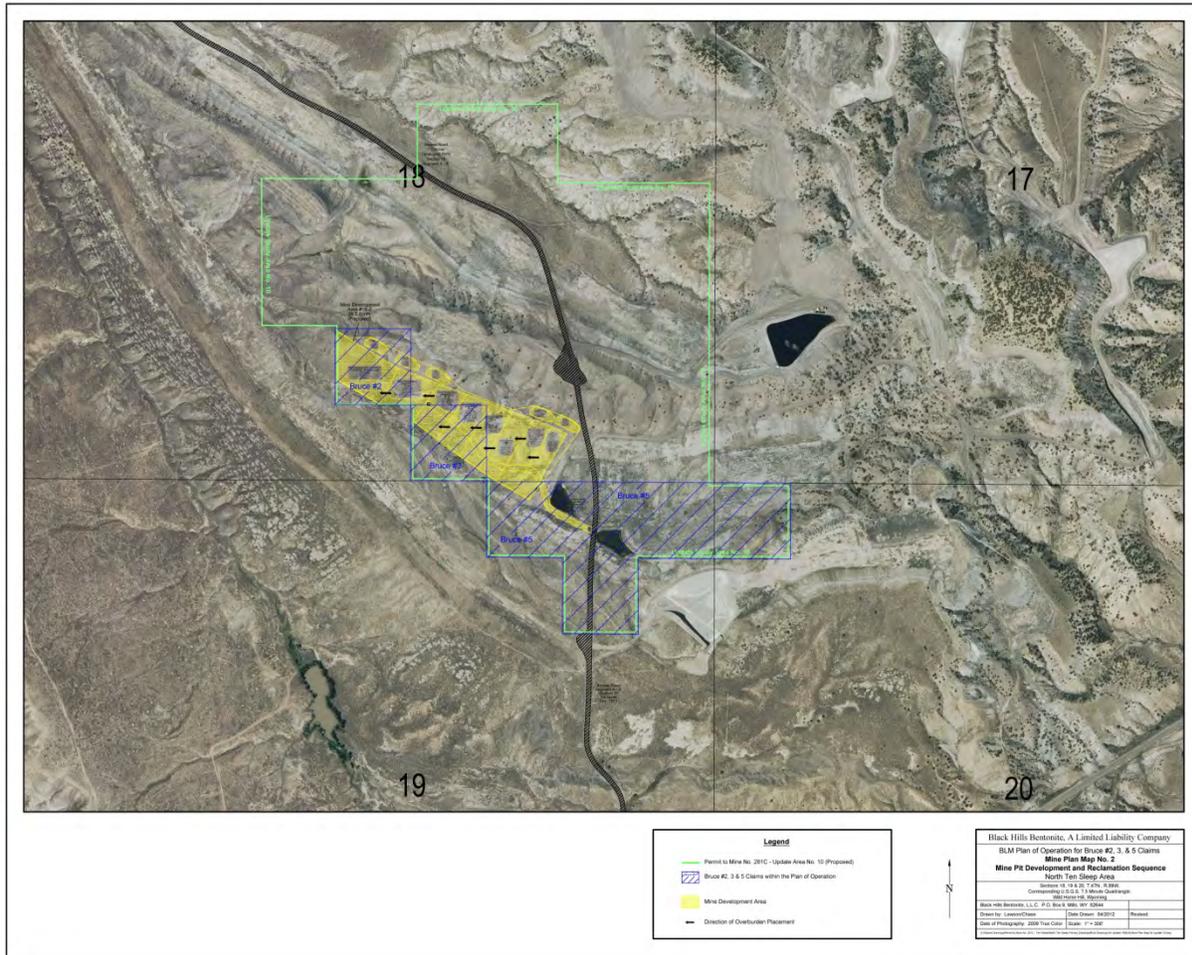


Figure 3. Pit sequence and mine development map.

2.2.3 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 seedlings 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.

Black Hills Bentonite 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.

2.2.4 Wildlife Protection and Monitoring

Mining will be conducted in order to minimize impacts to any raptor nest that is active and located within one-half (½) mile of surface disturbing activities during the breeding season of February 1 through July 31. In the event a raptor nest is established immediately adjacent to the surface disturbing activities and it becomes necessary to "take" or remove a raptor nest, the U.S. Fish and Wildlife Service will be contacted as soon as a "take" situation is anticipated. Sufficient lead time will be allowed for developing and implementing a mitigation plan, and to avoid disrupting the mining operation.

In the event that a T & E species is observed on or immediately adjacent to the surface disturbing activities, the U.S. Fish and Wildlife Service - Endangered Species Office located in Cheyenne, Wyoming will be notified and the observations reported. Proper mitigation or avoidance will be conducted for these species through the required coordination with the appropriate management agencies.

Based on correspondence received from the Wyoming Game & Fish Department (WGFD), the WGFD recommends that the standard non-core stipulations for sage grouse be followed for all areas outside sage grouse core population areas. These non-core stipulations recommend that no permanent disturbances should occur within one-quarter mile of active sage grouse leks and no disturbing activities should occur within two miles of active leks from March 15th through June 30th.

No active leks are located within one-quarter mile of proposed mining activities associated with this update area. The nearest active lek, the Big Cottonwood Lek, is located two (2) miles from proposed surface mining and surface disturbing activities associated with this update area.

In the event that an active sage grouse lek should become established within two miles of surface mining activities on the update area, BHB will adhere to the standard non-core area sage grouse stipulations recommended by the WGFD.

Raptor nests are not present on the update areas but are present within one mile. Future mining will be conducted in order to minimize impacts to any nests that are present or that may become established during the breeding season of February through July. MBHFI species were not common on the study area but will be protected wherever they are found.

Black Hills Bentonite personnel will continue to conduct observations for any activity of wildlife species of major concern. Proper mitigation or avoidance will be conducted for these species through the required coordination with the appropriate management agencies.

In the event that a threatened or endangered species should frequent or become established on or adjacent to the update area, Black Hills Bentonite will contact the BLM, U.S. Fish and Wildlife Service and the Wyoming Game and Fish Department in order to develop and implement the necessary mitigation measures to prevent disturbance or impacts to any such species.

2.2.5 Management of Noxious Weeds and Invasive Plants

Noxious weeds, as defined by the Washakie County Weed and Pest District, will be controlled on disturbed or reclaimed areas on this POO area.

2.2.6 RECLAMATION PLAN

2.2.6.1 Post Mining Land Uses

Foraging by livestock and wildlife, and wildlife habitat are the post-mining land uses for lands affected by mining activities on the project area.

2.2.6.2 Contouring Plan

All mining features will be graded and contoured in such a manner that the approximate original contours (AOC)

will be reestablished and the land will drain in order to prevent ponding of water. Post mining slopes will be graded to 4H:1V or flatter, with a straight slope profile, unless the pre-mine slopes were steeper. In those cases, post-mining slopes will approximate the pre-mining slopes in terms of magnitude, aspect and shape. Topsoil will be reapplied to the approximate original depth.

Overburden stockpiles which will remain as a permanent reclamation feature will be graded and contoured to blend with the existing topography and all slopes will be reduced to 4(H):1(V) or flatter unless pre-mining slopes were steeper.

Small ephemeral swales which may be affected during the course of mining activities will be reestablished during the backfilling of pits and by grading and contouring. No significant drainages will be affected by mining operations. Significant drainages are defined by Wyoming Department of Environmental Quality/Land Quality Division, District II as those that are shown as a blue-line on the U.S.G.S. topographic map.

All secondary access roads constructed on this project area will be reclaimed when they are no longer needed. Reclamation will consist of removing the road base material and installed culverts. The roadways will be graded to the approximate original contours in order to blend with the surrounding topography. After grading and prior to the application of topsoil, the roadway will be scarified with a motor grader or ripped utilizing a D-8 dozer. Topsoil will be reapplied to the thickness originally removed from the roadway.

2.2.6.3 Surface Preparation for Topsoil Application

Overburden that has been compacted by heavy equipment will be ripped prior to topsoil application. Segregated overburden, if it is salvaged, will be applied to all backfilled pits and graded and contoured overburden stockpile areas prior to the application of topsoil. The segregated overburden will be graded prior to applying topsoil in order to facilitate a uniform application of topsoil.

2.2.6.4 Topsoil Replacement

Stockpiled topsoil will be applied to the backfilled and contoured overburden with Caterpillar 627F push-pull scrapers or, in some instances, with bulldozers. Topsoil will be reapplied to approximately the original topsoil depth and will be disked on the contour in order to prepare a seed bed.

Topsoil will be bladed with a motor grader following application in order to eliminate rough areas, thus ensuring a more uniform distribution of topsoil over the entire area. Topsoil will be applied to the affected areas as soon as possible, although the replacement schedule for topsoil application is dependent upon the mining and backfilling schedule. Topsoil application is generally conducted during the late summer or early fall, in advance of the fall planting of the permanent seed mixture.

2.2.6.5 Revegetation Practices

Vegetation Map 1 (Figure 5) shows the area of specific interest associated with this mine plan of operations. Table 2 indicates the Vegetation Type and Map Unit Acreages.

2.2.6.6 Cover Crops and Mulch

If a fall seeding with the permanent (perennial) mixture is not possible due to weather or other circumstances, the area will be seeded with an annual small grain sterile hybrid such as Quickguard the following spring in order to establish a cover crop. The cover crop will be drill seeded at a rate of forty (40) pounds per acre. The cover crop will be inter-seeded with the permanent (perennial) seed mixture in the autumn of the same year.

No mulch will be applied in conjunction with the reclamation activities conducted on the project area.

2.2.6.7 Permanent Seed Mixtures

The permanent (perennial) seed mixture will be planted in the fall, generally beginning during the month of October. Seed will be planted utilizing a standard grain drill or a no-till drill. The seed will be planted approximately one-

quarter to one-half inch in depth. Other seeding practices, such as hand broadcasting of sagebrush seed in specific areas, may be employed in order to establish sagebrush on the project area.

Species contained in the permanent seed mixture for the project area have been selected based on the following criteria:

- Adaptability to existing soil conditions
- Forage potential and palatability to livestock
- Forage, cover and habitat potential for wildlife
- Pre-mining presence as documented by vegetation inventory
- Reclamation success proven by previous revegetation efforts
- Contribution to species and structural diversity
- Ability to remain self-sustaining
- Commercial availability

The components of this seed mixture are listed below:

<u>Common Name (Variety)</u>	<u>Pounds of pure live seed per acre</u>
Bluebunch wheatgrass (Secar CT)	3.00
Indian ricegrass (Rimrock CT)	3.00
Russian wildrye (Bozoisky)	1.00
Bottlebrush squirreltail	3.00
Gardner saltbush	2.00
Fourwing saltbush	2.00
Wyoming big sagebrush	1.00
Rubber rabbitbrush	0.50
Western yarrow	0.50
Scarlet globemallow	0.50
American vetch	2.00
Total	18.50

2.2.6.8 Temporary Seed Mixtures

No temporary seed mixtures will be used on the project area other than annual small grains previously discussed.

2.2.6.9 Protection of Seeded Areas

At the discretion of Black Hills Bentonite, based on knowledge of grazing intensity on the project area, newly seeded areas will be fenced to protect these areas from grazing by livestock. If fences are constructed, they will be constructed to allow the egress and ingress of wildlife species.

If fences are constructed on BLM administered lands, they will be built in accordance with approved BLM designs and specifications.

The Vegetation Inventory represents a compilation of two separate vegetation inventories conducted for Black Hills Bentonite by Intermountain Resources in 2003 and 2008. Total inventoried acreage is three hundred sixty (360) acres. Update 10 is comprised of two hundred eighty (280) acres within the 2003 and 2008 study areas.

The initial 2003 study area included two hundred twenty (220) acres in Sections 17, 18, 19 & 20, T.47N., R.89W. This includes eighty (80) acres in Section 17 that is not part of this update package and one hundred forty (140) acres that is included in this update package. The 2008 inventory includes an additional one hundred forty (140) acres all of which is included in the Update 10 acreage.

Table 2, Vegetation Type and Map Unit Acreages on the Black Hills Bentonite’s BLM Plan

of Operation Acreage - Bruce #2, 3 and 5 Claims

Veg. Type/Map Unit	Update Area Acres	Percent of Area	Proposed Disturbed Acres
Mine Reclamation (MR)	33.0	47.1	1.2
Outcrop Barrens (O)	18.3	26.1	8.8
Juniper Outcrop (JO)	0.6	1.0	0.0
Disturbed Land (DL)	1.5	2.1	0.6
Sagebrush Shrubland (SS)	14.5	20.7	2.8
Reservoir (R)	2.1	3.0	0
TOTAL	70.0	100.0	13.4

2.2.6.10 Reclamation Evaluation Procedures

2.2.6.10.1 Reclamation Goals

All lands affected under this project will be reclaimed in such a manner that forage for livestock and wildlife will be reestablished to a condition equal to or greater than pre-mining conditions on the affected lands.

Revegetation of lands affected under this project area will be considered complete and eligible for full bond release when the following criteria are met:

- 1) the vegetation species of the reclaimed land are self-renewing under natural conditions prevailing at the site;
- 2) the total vegetation cover of perennial species, (excluding noxious weed species) and any species in the approved seed mix is at least equal to the total vegetation cover of perennial species (excluding noxious weed species) on the area before mining.
- 3) the species diversity and composition are suitable for the approved post-mining land use; and
- 4) the requirements in 1), 2) and 3), are achieved during one growing season, no earlier than the fifth full growing season on the reclaimed lands.

2.2.6.10.2 Extended Reference Areas

Black Hills Bentonite, L.L.C. (BHB), will employ the use of Extended Reference Areas (ERA), as described by WDEQ/LQD Guideline No. 2, March 1986 for the purpose of evaluating post-mining reclamation success of affected lands on the project area. ERA's will be established for each vegetation type or mapping unit described in the Vegetation section which will experience disturbance from mining or associated disturbances.

The selection and verification of the representative nature of the ERA's will be determined by evaluation of the vegetation mapping, pre-mining vegetation data, soils data, physiography, and land use information. The actual sampling locations on the ERA's will be mutually selected on-site with BLM, WDEQ/LQD and BHB personnel present.

2.2.6.10.3 Evaluation of Reclamation Success

Reclamation success will be evaluated by collecting quantitative data from the extended reference areas and reclaimed area and directly comparing, by standard statistical procedure, the resulting data from each site. Data will be collected from an adequate sample size from each area. Adequate sample size will be determined using the information presented in WDEQ/LQD Guideline No. 2, Section IV - Estimating Adequate Sample Size, March 1986. Alternatively, other procedures agreed upon with LQD and BLM may be used to measure reclamation

success.

Each sampling site will be randomly located on each area. Sampling for aerial cover will be conducted using point intercept sampling techniques which will include percent total cover and percent absolute vegetation cover. Total herbaceous production data will not be collected from the reclaimed area or the ERA. Production will be qualitatively judged based on visual comparisons and field reconnaissance of the reclaimed lands and the ERA areas. The vegetative cover data collected from the reclaimed area and the ERA's will also be used to qualitatively judge total herbaceous production.

Based on the extended reference area concept, there will be no re-use of pre-mining vegetation data in the evaluation of reclamation success where extended reference areas have been or will be used. Quantitative vegetation data (percent cover) gathered from the appropriate extended reference and reclaimed areas will be directly compared by standard statistical procedure (confidence level = 80%, $\alpha=0.2$) as recommended by WDEQ/LQD Guideline No. 2, March 1986.

Species composition and species diversity present on the reclaimed areas will be qualitatively judged based on the relationship between the species present and the post-mining land uses. Species establishment from qualitative and quantitative aspects will be based on the permanent seed mixture. The establishment of these species will be determined through documentation in the quantitative data collected and through qualitative observations using percent cover estimates and qualitative abundance estimates.

The post-mining evaluation process for the determination of full bond release will also include the construction of a species list and an evaluation of surficial stability. The development of a species list for the reclaimed area will provide quantitative data on the total number (diversity) and kinds (composition) of species established from seeding, and the total number and kinds of species established through natural succession. The species list will be compiled by conducting a thorough field reconnaissance of each reclamation unit and recording all plant species observed. This species list and the cover data will provide the basis for demonstrating the quantity and quality of plant species established on the reclaimed lands. This information will be provided for BLM and LQD review when bond release is requested. The development of a detailed species list will provide information on the ability of the reclaimed lands to support the post-mining land uses and should also provide data on the capability of the vegetation to renew itself. Surficial stability of the reclamation units will be assessed by visual field reconnaissance by BLM, WDEQ/LQD and BHB personnel present on site.

BHB personnel will make the preliminary decision on the timing of any full bond release request, based in part upon comparison of annual observations of reclamation success and progress. In general, BHB anticipates that 2-3 years of accumulated reclamation may be combined in a single bond release request. In each request package, BHB will also provide a written statement that the reclamation is satisfactory to the surface owner.

2.2.6.11 Final Hydrologic Restoration

All pits will be backfilled, with no depressions, allowing for through-drainage. Post-mining topography will approximate the pre-mining topography in terms of magnitude, aspect and slopes. No impoundments are included as final reclamation features in the reclamation plan for the project area.

As mining progresses, all secondary access roads and culverts that are no longer needed will be removed and the areas will be graded to restore the approximate original topographic contours.

2.2.6.12 Reclamation Schedule

Reclamation of disturbed areas will begin as soon as possible, and all attempts will be made to assure that reclamation occurs concurrently with mining activities or at an increased pace. Field drying of bentonite will occur on this project area. Therefore, reclamation activities will begin within three years from the date a pit was developed, and reclamation (seeding) will be completed within five years from the date the pit was affected.

2.2.7 Design Features

The BLM can set forth design features that are necessary for the protection of the surface resources, uses and the environment; and for the reclamation of the disturbed lands. Design features are those specific means, measures, or practices that make up the proposed action and alternatives. Additional design features are added as needed to the proposed action or alternatives. Regulations, standard operating procedures, stipulations, and operator committed measures, and best management practices are usually considered design features.

2.2.7.1 Invasive Species

In addition to the operator committed measures identified in the Mine Plan, the following BLM proposed Design Features have been included in the analysis of the Proposed Action: include implementation of a weed management plan that complies with IM WY-2012-032

Manage Invasive Plants

- a. Assess for invasive plants before initiating surface disturbing activities.
- b. Develop an invasive plant management plan.
- c. Control invasive plants utilizing an integrated pest management approach.
- d. Monitor invasive plant treatments.

Use of pesticides would comply with the applicable Federal and state laws. Pesticides would be used only in accordance with their registered uses and within limitations imposed by the Secretary of Interior. Prior to the use of pesticides, the holder would obtain from the authorized officer written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the authorized officer prior to such use.

2.2.7.2 Hazardous Materials

The Operator and their contractors would comply with all applicable federal and state laws and regulations as they relate to hazardous substances, hazardous waste, used oil and solid waste. Hazardous substances are those chemicals listed in Title III List of Lists, EPA's Consolidated List of Chemicals Subject to Emergency Planning and the Community Right to Know Act (EPCRA) and Section 112(r) of the Clean Air Act, as amended, or the 40CFR 302.4 Table-List of Hazardous Substances and Reportable Quantities, as amended. In the event any hazardous substances are used, they would be handled in an appropriate manner to prevent environmental contamination. Any release of hazardous substances of reportable quantities, would be reported both to the National Response Center (NRC), as required in the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300), and the Oil and Hazardous Pollution Contingency Plan for the Wind River Bighorn Basin District. Solid waste and used oil are defined and regulated under the Resource Conservation and Recovery Act (RCRA).

2.2.8 Standard Stipulations

As per §43 CFR 3809.420 (8): *Cultural and paleontological resources.*

(i) Operators shall not knowingly disturb, alter, injure, or destroy any scientifically important paleontological remains or any historical or archaeological site, structure, building or object on Federal lands.

(ii) Operators shall immediately bring to the attention of the authorized officer any cultural and/or paleontological resources that might be altered or destroyed on Federal lands by his/her operations, and shall leave such discovery intact until told to proceed by the authorized officer. The authorized officer shall evaluate the discoveries brought to his/her attention, take action to protect or remove the resource, and allow operations to proceed within 10 working days after notification to the authorized officer of such discovery.

(iii) The Federal Government shall have the responsibility and bear the cost of investigations and salvage of cultural and paleontology values discovered after a plan of operations has been approved, or where a plan is not involved.

Paleontology

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 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.

2.3 *Alternative 2 – 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.

2.4 *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 net positive or net negative changes in potential effects. Relocation may remove the operation from lands where the quality or quantity of bentonite is known through exploration and would not meet the operator needs, may be outside of placer claims located by the Black Hills Bentonite (BHB) 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 AFFECTED ENVIRONMENT

Resources and features not present, and not discussed in this EA, include: riparian areas, Class I & Class II visual management areas, Class I Airsheds, environmental justice, prime or unique farmlands, Wild and Scenic Rivers, fisheries, wetlands, Lands with Wilderness Characteristics, ACECs, and wilderness. Other than livestock grazing, wildlife use, oil & gas exploration, mining and hunting 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, Land Use, and Land Ownership

The proposed bentonite pits and related roads are located in Washakie County Wyoming, and 6th principal meridian (Figure 1). Legal descriptions down to the section are found in Table 1 of this document. The pits, topsoil and overburden piles, and haul roads would be partially located on public lands managed by the federal government (BLM). The project area has historically been used for livestock grazing, wildlife habitat and bentonite mining. Bentonite mining activities have occurred in the vicinity of this project area since the 1970's. Mining operations are currently active on privately owned lands in the immediate vicinity of this POO.

3.2 Geology

The Big Horn Basin is an area bounded by Laramide mountain building to the northwest, north, and east, along with Absoraka volcanics to the west. The center of the basin is filled with flat-lying Eocene sedimentary rocks, with progressively more complex folding and faulting in Mesozoic and Paleozoic strata as the flanks of the mountains are approached.

The pre-mining topography of the Plan of Operation (POO) area is illustrated on Map No. L-1 (Figure 2). The project area is located on semi-arid upland topography of the western flank of the Big Horn Mountain foreland near Ten Sleep in north-central Wyoming. Dry mountain ranges and foothill slopes dominate the general area.

The Nowood River is the closest permanent water source and is located approximately 4 miles east of the project area. Big Cottonwood Creek, an ephemeral drainage, meanders within two and one-half miles west of the project area.

Elevations range from 4,851 feet on the east side of the project area to approximately 4,700 feet, along an unnamed tributary of Big Cottonwood Creek in the northwest side of this 70 acre project area. Terrain is relatively rugged in the POO area and is characterized by narrow ridgelines with moderate to steeply inclined slopes. The major landforms typically trend north-northwest by south-southeast with projections extending in various directions. Highly sheet-washed, ephemeral drainages reveal incised channels with narrow terraces. Drainage is to the northwestward via a series of intermittent streams into Big Cottonwood Creek.

The project area lies on the western side of the Big Horn Mountains, on the eastern "shoulder" of the Big Horn Basin, approximately 6 miles west of Ten Sleep, Wyoming. This "shoulder" is a platform of anticlines and synclines that encircle the basin. This zone is between five and ten miles wide and forms a bench between the main mountain masses and the deep trough of the Big Horn Basin.¹

The seventy acre project area contains outcrops of the Lower Cretaceous Mowry Shale. The Mowry formation generally consists of alternating layers of soft and hard siliceous shale. In the Ten Sleep mining area, the Mowry formation contains three commercial bentonite zones which occur sixty to one hundred and fifty feet below the Mowry-Frontier contact. In addition to the commercial beds, which are two to five feet thick, there are numerous bentonite layers which are too thin to currently be of value.

¹ Roadside Geology of Wyoming, Lageson, David , and Darwin R. Spearing, 1988, Page 165.

The bentonite to be mined in the POO area consists of the “Double” bed within the Mowry Shale. Overburden above this bentonite bed is generally characterized as grey, siliceous marine shale.

3.3 Hydrology

3.3.1 Surface Water / Surface Water Quality / Riparian

Historical water quality data from the area is very limited due to the ephemeral characteristics of the watershed. General water quality from runoff of shale type outcrops and saline areas in the basin is of poor quality with elevated PH and total dissolved solid parameters as evidenced by reservoir water quality monitoring in the watershed by the BLM in 2003 and 2004.

3.3.1.1 Surface Water

The proposed action is located within the Big Cottonwood Creek sub-watershed. The sub-watershed is located within a 10-14" precipitation zone. The watershed is a semi-arid intermittent watershed that is a tributary to Nowood Creek several miles north of the proposed mining area. Current disturbances to the watershed are from haul roads, culverts installed along access roads, open pit areas, and stockpiles in the vicinity of the mining area.

The Nowood River is the closest permanent perennial water source and is located approximately 4 miles east of the project area. Big Cottonwood Creek, an intermittent/ephemeral drainage, meanders within two and one-half miles west of the project area. Erosive bedrock outcrops with high rates of natural erosion in upland areas are present in the mining area of the sub-watershed. There are several smaller ephemeral drainages that reveal incised channels with narrow terraces that are classified as Rosgen F and G type channels (Rosgen, 1996). Drainage is to the northwestward via a series of ephemeral drainages into Big Cottonwood Creek. Although defined channels were present, the ephemeral streams within the study area are classified as non-jurisdictional since they do not flow continuously for three consecutive months out of the year and do not appear to have a significant nexus to traditionally navigable waters.

There is one permitted stock reservoir is located in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 19, T.47N, R.89W. This reservoir does not appear on the Wild Horse Hill United States Geological Survey (USGS) 7.5 minute topographic map but is illustrated on the Mine Plan and Vegetation Map and Soils Map included in this environmental assessment and plan of operation.

3.3.1.2 Ground Water / Ground Water Quality / Riparian

A search of the Wyoming State Engineers data base indicated there are no adjudicated ground water rights on the project area. There are also no adjacent springs or seeps in the vicinity that would suggest the presence of a perched ground water source. The geologic unit of the Mowry Shale is considered a confining unit and the presence of shallow ground water is uncommon. However, isolated perched water tables lying on top of the bentonite were occasionally encountered when drilling deep (35-40 feet) exploration holes on this area.

3.4 Air Quality

The project area is located approximately 8 miles west of the town of Ten Sleep, Wyoming, in northeastern Washakie County. The average elevation of the area is approximately 4,420 feet above sea level with a cool, semiarid, inland continental climate. Weather in the area is rapidly changing and can produce a variety of extreme conditions in a relatively short period of time. The average wind velocity for the entire area is less than five miles per hour. This portion of the Big Horn Basin is generally protected from the prevailing southwesterly winds; however, the strongest winds are northerly.

Temperature and Precipitation

Climatological records for Ten Sleep, Wyoming reveal that temperatures in this area tend to be cool with substantial seasonal and diurnal variations. The large temperature fluctuations are due to the advent of warm and cold air masses and the relatively high elevation of the area. This permits rapid incoming and outgoing radiation. The

mean daily temperature is 48.2 degrees. The hottest month is July. January is typically the coldest month. Temperatures may reach as high as 102 degrees in July and as low as -34 degrees in December.

The average annual precipitation for the area is 13.00 inches. May typically has the highest mean precipitation (2.20 inches) while January had the lowest (0.51 inches). Approximately 70 percent of the moisture falls in thunderstorms during the growing season of late spring and early summer. Snowfall amounts are fairly uniform from November through February. Snowfall amounts are somewhat heavier during February and March.

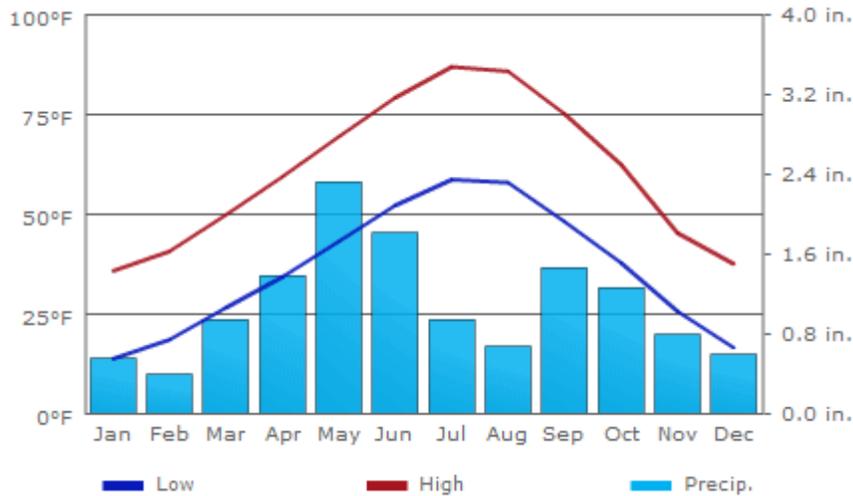
The primary air-borne pollutant within the plan of Operation area is Particulate Matter (PM) in the form of fugitive dust. There is one air quality monitoring station located in Big Horn County, however to date no local background air quality information available. The closest air quality monitors providing data 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 are not available. An air quality permit from the Wyoming Department of Environmental Quality has not been required for the operation of bentonite mines within the Bighorn Basin.

Although no site-specific climatic information is available for this Area, the following information was obtained for the Tensleep, Wyoming area. Average annual precipitation is 13.1 inches; and the average annual temperature is 35.9 degrees Fahrenheit. The climate of the area is typical of cold desert regions of the intermountain west. Forty-nine percent of the yearly precipitation occurs in April, May, June and July.

No wind speed or direction information is available for this specific area. However, the average wind speed at the Greybull Airport ASOS (KGEY), 34 miles south of Lovell, has the average wind speed at 6.9 mph from 1998 – 2006 according to the website for automated stations (ASOS) at (<http://www.wrcc.dri.edu/htmlfiles/westwind.final.html>).

The following charts with web-site citation indicate recent climatic averages for Tensleep, Wyoming.

Average Monthly Climatic Information						
Temperature-Precipitation Average Tensleep. Wyoming						
	Jan	Feb	March	April	May	June
Average high in °F	36	40	50	59	69	79
Average low in °F	14	18	26	34	43	52
Av. precipitation - inch	0.55	0.39	0.94	1.38	2.32	1.81
	July	Aug	Sep	Oct	Nov	Dec
Average high in °F	87	86	75	62	45	37
Average low in °F	58	58	48	38	26	16
Av. precipitation - inch	0.94	0.67	1.46	1.26	0.79	0.59



Totals and averages

Annual average high temperature	60.4 °F
Annual average low temperature	35.9 °F
Average temperature	48.2 °F
Average annual precipitation	13.1 in.

<http://www.usclimatedata.com/climate.php?location=USWY0163>

Ten Sleep, WY (82442) Weather Facts

- On average, the warmest month is July.
- The highest recorded temperature was 105°F in 2005.
- On average, the coolest month is December.
- The lowest recorded temperature was -34°F in 1990.
- May is the average wettest month.

<http://www.weather.com/weather/wxclimatology/monthly/graph/82442>

GROWING SEASON – Early freezes in the fall and late in the spring are characteristic of the project area. This results in long winters and short growing seasons. This is a country of rapid changes through the fall, winter, and spring seasons, with frequent variations from cold to mild periods. The average growing season (freeze-free period) for the principal agricultural areas is approximately 125 days according to the Western Regional Climate Center website at <http://www.wrcc.dri.edu/>

No wind speed or direction information is available for this specific area. The average wind speed at the Worland Airport ASOS (KWRL), 33 miles north of Thermopolis, has had an average wind speed at 5.7 mph from 1996 – 2006 according to the website for automated stations (ASOS) at <http://www.wrcc.dri.edu/htmlfiles/westwind.final.html>.

3.5 Soils

Shell Valley Consulting, Inc. (SVC) conducted a soil inventory for the Black Hills Bentonite for Wyoming Mining Permit 281C March of 2009. The objective of the SVC study was to:

- 1) develop soil map units and delineate boundaries aerial photographs;
- 2) define soil physical and chemical characteristics and;
- 3) determine suitability and salvage depths of topsoil/subsoil.

The soil map produced by SVC (Figure 7), the soils map amended by BLM (Figure 8) and the overall quality of the document will be instrumental in determining the suitability and depth of the topsoil and subsoil resources, and will be critical for reclamation activities.

The soils in the mine area have formed from parent material represented by alternating beds of incompetent and resistant sedimentary rocks from ancient inter-bedded lacustrine deposits of shale, clays and calcareous sandstones associated with the Frontier, Mowry and Thermopolis Shale geologic formations. These beds have been affected by geologic folding, hydrologic runoff and erosional patterns to form a landscape of low rolling ridges, relatively steep escarpment slopes and eroded drainages. Soil chemical and physical properties vary accordingly. Overall topographic aspects vary and elevations range between approximately 4,800 and 5,000 feet above sea level.

The table below prepared by SVC describes the soil map units and the salvage depths for reclamation material. Further details concerning the soil resource are included in Appendix D7 of the submitted hard copy Plan of Operations for Black Hills Bentonite, LLC Wyoming Mining Permit 281C, Tensleep Update Area No 10. This document includes detailed profile descriptions, a profile summary, soil laboratory data, and the soil map of the mine area. The reader is directed to this document for further details concerning the soil resource.

Soil Map Units, Descriptions and Recommended Salvage Depths

<i>Map Unit</i>	<i>Description</i>	<i>Topsoil Salvage Depths (inches)</i>	<i>Subsoil Salvage Depths (inches)</i>
Bo-t	Bondman taxadjunct; 3-20% slopes (increased clay content)	6	12
Ki	Kishona; 0-5% slopes	will not be affected	
Sa-t	Sayles taxadjunct (sodic subsoil); 3-12% slopes	6	3
UH	Unnamed Haplocambid; <15% slopes	6	12-18
OC	Bare Clay/Shale Outcrops (20% Shingle inclusions); variable slopes	0	0
Mapping Complexes*			
BLC	Badland Complex; (40% OC, 50% Shingle/ Shingle taxadjunct/Samsil taxadjunct, 10% Unnamed Haplocambid); <30% slopes	Variable; 0-6 (topsoil)/0-30 or lithic-paralithic contact (subsoil)	
RC	Ravine Complex; (70% steep Shingle, 10% Torrifluent, 10% OC, 10% Bondman) **note steep = >30% slopes	variable by soil type	
RLn	Reclaimed Mine Lands-north	8	0
RLs	Reclaimed Mine Lands-south	6	0
SHC	Shingle Complex; (70% Shingle, 30% OC); <15% slopes	variable by soil type	
TFC	Torrifluent Complex; (30% Youngston /Lostwells, 40% OC, 30% Shingle); <5% slopes	variable by soil type, Youngston/Lostwells will not be affected	

The Sagebrush Shrubland habitat type occupies a small portion of the 2003 update area and is a major vegetation type on the 2008 update area. This type is typified by gentle to steep slopes and has moderate to deep soils. This plant community type is dominated by shrub and perennial grass species.

Habitat Type Acreages for the Black Hills Bentonite North Ten Sleep Update Area
No. 10 Surveyed in 2003 and 2008.

Plant Community /Habitat	Update Area	Percent of Acreage	Update Area
2003			
Sagebrush Shrubland	(S)	16.0	7.3
Outcrop Barrens	(O)	52.6	23.9
Juniper Outcrop	(JO)	37.7	17.1
Mine Reclamation	(MR)	90.2	41.0
Disturbed Land	(DL)	23.5	10.7
<hr/>			
TOTAL		220.0	100.0
2008			
Sagebrush Shrubland	(S)	51.2	36.5
Outcrop Barrens	(O)	37.9	27.1
Juniper Outcrop	(JO)	12.6	9.0
Mine Reclamation	(MR)	36.5	26.1
Disturbed Land	(DL)	1.8	1.3
<hr/>			
TOTAL		140.0	100.0

3.6.2 Invasive Species

The immediate area encompasses drainages and reservoirs, which have been invaded to some extent by tamarisk (salt cedar) and Canada thistle. Downy brome (cheatgrass) and common (Japanese) brome has invaded the native rangeland.

According to *North Ten Sleep Update Area No. 10 APPENDIX D8 VEGETATION INVENTORY*, there has been a significant increase in invasive species cover over the last decade: “Annual grasses comprised from 0.6 to 2.8 percent of the total relative vegetative cover on the 2003 study areas. Cheatgrass brome and Japanese brome (*Bromus japonicus*) were the only annual grass species encountered in 2003. Cheatgrass brome was the dominant annual grass species encountered in this area. In 2008, annual grasses comprised from 5.4 to 8.6 percent of the total relative vegetative cover on the Section 18 update area.”

3.7 Livestock Grazing

The proposed mining claim development would occur in the Big Cottonwood Creek Allotment #00132. This allotment is permitted for cattle grazing from 05/05 to 06/08, and 10/15-12/02. The allotment is also permitted for sheep grazing from 12/15-02/28, although sheep have not grazed the allotment for several years. Rangelands are sparsely vegetated, typical of badlands soils in this area, and provide very little livestock forage.

3.8 Wildlife

Wildlife habitat in the project area is characterized by rolling hills and bentonite ridges with incised drainages flowing generally into the Big Cottonwood Creek to the west and Nowood Creek to the north. The habitat is dominated by Wyoming big sage brush with a mixture of perennial grasses and shrubs, along with numerous annual forbs and grasses with a prominent component of cheat grass. Habitat exists in the project area that is capable of supporting a wide range of wildlife species such as mule deer, pronghorn antelope, elk, numerous shrubland passerine species, sage grouse, chukars, raptors, predators, and small mammals.

The proposed project area is not within a sage grouse core breeding area, however portions of it are within the two-mile buffer zone of an active sage grouse lek to the west. No other crucial wildlife habitat has been designated by the Wyoming Department of Game and Fish within the project area and no threatened or endangered wildlife species are known to use the area. The Big Cottonwood Lek was surveyed five times for sage grouse breeding activity between March 29 and April 21, 2011, and was determined to be in an active status. Over the five site visits to the lek, numbers of males ranged from 9 to 15 birds, and females ranged from 0 to 5.

3.9 Recreation and Visual Resources

3.9.1 Recreation

The project area is located in BLM-administered public lands that are not managed under either special or extensive recreation management areas (RMA). Public lands that are not designated as RMAs are managed to meet basic recreation and visitor services and resource stewardship needs. Recreation is not emphasized within this area, but is recognized that recreational activities occur, primarily hunting, and other minimal activities associated with dispersed recreation. These activities are very limited because of the current industrial type of settings are not desired for most outdoor recreational use, and access to some BLM lands requires permission through private lands.

Recreational settings in the majority of the project area range from back country to rural country:

- Remoteness: Within 1/2 mile of low-clearance or passenger vehicle routes (includes unpaved County roads and private land routes);
- Naturalness: Character of the natural landscape considerably modified (industrial);
- Contacts: 30 or more encounters per day on travel routes;
- Evidence of use: A few large areas of alteration. Surface vegetation absent with hardened soils. Sounds of people frequently heard;
- Access (types of travel allowed): Ordinary highway auto and truck traffic is characteristic.

Travel and transportation management limits motorized use to designated roads and trails. Until a travel management plan designated these travel routes, motorized use is limited to the existing roads and trails until a plan either keeps travel routes open, or closes them to motorized use.

3.9.2 Visual Resources

The project is located on public lands inventoried as visual resource inventory (VRI) class IV. The scenic quality levels were inventoried as a "C" ratings, and low sensitivity levels. Currently, the BLM-administered public lands are managed under VRM Class IV objectives. The public lands within and surrounding the proposed project area exhibit a low degree of natural contrast, and are allocated for major surface disturbing activities.

3.10 Cultural and Historic Resources

3.10.1 Paleontology

The surface formations within the project area are Frontier Formation, Mowry Shale, and Thermopolis Shale. These formations have a PFYC (Potential Fossil Yield Classification) rating of 3, meaning they have moderate sensitivity for paleontological resources. Typical fossils within these formations include invertebrates and marine vertebrates. Significant localities are not common within these formations. Due to the low probability for affecting significant localities no paleontological inventory was required.

3.10.2 Cultural Resources (Archeology)

Report #1511045--

A Class III Cultural Resource Inventory was previously conducted on the proposed project area (BLM cultural project #1509060N). No cultural resources were identified.

3.11 Socioeconomics

In 2010 Black Hills Bentonite reported 17,904 man hours worked at their Tensleep mine with 9 employees and a production of 131,981 bank tons of bentonite mined (Adcock, 2010). At their Worland processing plant, Black Hills Bentonite reported 11 employees with a production of 135,776 bank tons of bentonite processed (Adcock, 2010).

3.12 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 which outlines how spills would be handled.

The public and public land users who travel any existing improved dirt roads that the operator would use to access the pits would notice an increase in traffic when equipment is being mobilized or demobilized from the pits or hauling of bentonite is taking place. Existing dirt roads were constructed to resource functional classification as per BLM manual section 9113. Wyoming allows a speed limit of 55 mph when roads are not posted. Wyo-Ben personnel and its contractors will observe a haul road maximum speed limit of 45 mph, unless situations dictate a slower rate of speed. The operator has committed to dust control measures as needed when bentonite is actively being hauled along the dirt portions of their existing designated haul roads and to upgrade and maintain such segments to the standards in the BLM's road standards manual section 9113.

Hazardous Substances, Hazardous Wastes and Solid Wastes

Throughout the life of the mine there is a potential for the operator to use chemicals that could be classified as hazardous substances, hazardous materials or hazardous chemicals. A list of potential substances that would likely be used in the mining operation follows.

Table 3.1 Potential Hazardous Substances List

Hazardous Material	Purpose
Diesel Fuel	Fuel
Gasoline (unleaded)	Fuel
Grease and Lubricants	Equipment lubrication
Engine Oil	Engine lubrication
Ethylene Glycol	Engine coolant
Hydraulic Fluid	Hydraulic equipment and lines
Acetylene	Welding and cutting
Propane	De-icing as required

4 ENVIRONMENTAL EFFECTS

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 70 acres potentially over a period up to 10 years in length.

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- 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 bentonite would cause an irretrievable loss of that locatable mineral. There is no established threshold of significance regarding removal of minerals although the resource management planning decisions permit such activities. Surface mining of bentonite is practiced in many other parts of the Bighorn Basin where beds of bentonite are exposed at or near the surface.

4.2.2 Alternative 2- 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.

4.3 Hydrology

4.3.1 Alternative 1 – Proposed Action

4.3.1.1 Surface Waters/Water Quality (surface) Riparian

The hydrology of the drainages would be altered temporarily by the re-routing of water around the overburden storage area. This would change the nature of the flow patterns surrounding the pits and downstream of the pits. Rill and gully formation will likely occur and exposed areas with no vegetative cover and on slopes greater than 5 percent. These rills and gullies that fall outside of the contained pit area are likely to transmit new sediment that would be introduced into the watershed if the area received a precipitation event even greater than 2 year, 6 or the 100 year 6 hour maximum precipitation events.

The operator has submitted a Storm Water Pollution Prevention Plan (SWPPP) as required by the State of Wyoming Department of Environmental Quality (WYDEQ). This plan outlines best management practices to be used in conjunction with the proposed action to reduce overall amounts of erosion into adjacent downstream drainages and prevent unnecessary and undue degradation to the hydrology of the watershed. Surface flow may be diverted on the up-slope side of pits and other affected areas to prevent accumulation of water in pits, and to prevent down slope sedimentation. The diversion of surface flows will be accomplished by constructing small v-ditches on the up-slope sides of pits and other mine development to divert surface flows away from these areas. These small v-ditches will normally be constructed with a motor grader or a dozer. Topsoil will be removed and stockpiled prior to constructing drainage diversions. If erosion occurs on the diversion areas, rock check dams, straw bales or water bars may be used to stabilize erosion and reduce sedimentation.

4.3.1.2 Ground Water

The overall transmissivity of the geologic unit is very low. The surface geology consists of the Mowry shale that is a confining unit therefore any potential impacts to ground water are very low. Isolated perched water was encountered at depths from 40-50 feet however; due to the proposed shallow (20-30 feet) mining depths, it is not anticipated that

ground water will be encountered. In addition there are no permitted ground water permits within the vicinity of the proposed action and therefore no impacts to ground water beyond the current situation would occur.

4.3.1.3 Water Quality

Any potential impacts to water quality would only be detected following storm events that are capable of producing runoff due to absence of connected perennial flowing water near the proposed action. The small scale of the disturbance, ephemeral channels, would make impacts negligible. The specific impacts from the proposed action are of too small of a scale and difficult to model due to the ephemeral flow regime of the sub-watershed. However, overall general best management practices in the mine plan and SWPP are in place to reduce potential impacts to water quality.

4.3.2 Alternative 2- No Action

Under the No Action Alternative, the development of the Proposed Action would not occur. No effects on water quality and surface waters would be expected to occur beyond the current levels of the project area.

4.4 Air Quality

4.4.1 Alternative 1- Proposed Action

Potential impacts in the mining area would occur from the release of primary air-borne pollutants within the plan of Operation area. This Particulate Matter (PM) would be 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. Specific effects from the proposed plan of operation are on such a small scale due to the way bentonite mining proceeds at 12-15 acres/year and at an average of eighty-eight working days/year.

4.4.2 Alternative 2- No Action

Under the No Action Alternative, the development of the Proposed Action would not occur. There would be no impacts to the area air. Background levels of particulate matter would remain the same.

4.5 Soils

4.5.1 Alternative 1- Proposed Action

Surface disturbance from mining activities would consist of removing of the vegetative cover, the excavation of the overburden, and segregating and storing topsoil and subsoil resources. The excavation of the overburden would totally alter the soil profile. Soil horizons would be obliterated and mixed. The overall soil health would be impacted through the alteration of the soil physical properties. There would be potential for reduction in organic matter. The soil surface layers, soil structure and soil depths would be altered. The exposed soil would be susceptible to the erosive forces of raindrop impact and overland flow.

The proposed action would allow for a more rapid recovery of soil health with respect to soil physical properties. Concurrent reclamation practices would reduce the time that the soil is bare. The soil reclamation material, including both subsoil and topsoil, would not be stockpiled for a long periods of time and, would retain much of its original physical properties such as organic matter content and structure, thus ensuring better reclamation. Surface disturbance would increase runoff and erosion. During active mining, the Water Erosion Prediction Project (WEPP), US Forest Service web based interphase; Disturbed WEPP model predicts a 14 percent probability of runoff with a 10 percent probability of erosion averaging 0.17 tons per acre per year, when modeled for 50 years. In the event of a 50-year storm cycle erosion could be as high as 7.0 tons per acre per year.

During the reclamation phase as herbaceous species become established, WEPP predicts an 8 percent probability of runoff and a 4 percent probability of erosion with erosion rates averaging only 0.05 tons per acre per year, again, when averaged over 50 years. In the event of a 50-year storm cycle erosion could be as high as 2.6 tons per acre per year.

A soil loss threshold of 5 tons per acre per year has historically been the established threshold for agricultural lands. Given the arid setting of the proposed action, the extent soils with depths less than 40 inches, and the minimally

developed topsoil layer, a threshold of 2 tons per acre per year has been established. Average erosion rates predicted by WEPP during the reclamation period are within this threshold. A 50-year storm cycle would exceed the 2 tons per acre threshold; given this scenario it is probable that reclamation activities could be impacted by runoff and erosion.

Runoff and erosion would be generated by the proposed haul road. The WEPP:Road model predicts that for every 200 feet of road surface there would be 215 pounds of sediment generated annually of which 72 pounds is projected to be available for transport beyond the 100 foot right-of-way.

Mitigation measures required under the Storm Water Pollution Prevention Plan are designed to keep sediment from leaving the mine site and haul road. No off-site impacts are anticipated.

4.5.2 Alternative 2- No Action

Under the No Action Alternative, the development of the Proposed Action would not occur. There would be no impacts to the soil resource. Runoff and erosion rates would remain at background levels.

4.6 Vegetation

4.6.1 Alternative 1- Proposed Action

4.6.1.1 Native Vegetation

Approximately 70 acres of public lands would be disturbed for the mining activities. This disturbance would reduce native vegetative species on the project area until reclamation goals have been achieved. With the implementation of the Reclamation Plan, the mine area would be properly reclaimed and, thus increasing the available forage for livestock and wildlife and decreasing the potential for erosion to occur.

4.6.1.2 Invasive Species

The disturbance associated with bentonite mining will increase risk for noxious weed and invasive species establishment and spread. Sources for weed seeds exist within and around the project site, and equipment can serve as a vector for spread. Appropriate measures for monitoring and treatment for invasive and noxious weeds would ensure establishment is caught at an early stage or prevented. Mitigation would include implementation of a weed management plan that complies with IM WY-2012-032

Manage Invasive Plants

- a. Assess for invasive plants before initiating surface disturbing activities.
- b. Develop an invasive plant management plan.
- c. Control invasive plants utilizing an integrated pest management approach.
- d. Monitor invasive plant treatments.

Use of pesticides shall comply with the applicable Federal and state laws. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of Interior. Prior to the use of pesticides, the holder shall obtain from the authorized officer written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the authorized officer prior to such use.

4.6.2 Alternative 2- No Action

Under the No Action Alternative, native vegetation would not be disturbed and there would be no change from present risk for noxious/invasive species establishment and spread.

4.7 Hazardous Materials

4.7.1 Alternative 1- Proposed Action

There is little potential for hazardous wastes to be generated from routine mining operations other than a limited potential to generate contaminated fuels. Used oil would be generated; though not considered hazardous, the disposal of used oil is regulated. Solid Waste, including but not limited to paper and card board, beverage containers, oil and lubricant containers and used tires, would be generated through mining operations.

Should hazardous substances be used in an improper manner, there could be environmental impacts resulting from an accidental spill or an inappropriate discharge. This could result in impacts to the soil, water, air, wildlife, and cultural resources, in addition to impacts to human health and safety.

Proper containment of fuels, oil and other hazardous substances in appropriately designed and maintained storage facilities and an immediate response in the event of a release would greatly reduce any potential impacts.

The Operator and their contractors would comply with all applicable federal and state laws and regulations as they relate to hazardous substances, hazardous waste, used oil and solid waste. Hazardous substances are those chemicals listed in Title III List of Lists, EPA's Consolidated List of Chemicals Subject to Emergency Planning and the Community Right to Know Act (EPCRA) and Section 112(r) of the Clean Air Act, as amended, or the 40CFR 302.4 Table-List of Hazardous Substances and Reportable Quantities, as amended. In the event any hazardous substances are used, they would be handled in an appropriate manner to prevent environmental contamination. Any release of hazardous substances of reportable quantities, would be reported both to the National Response Center (NRC), as required in the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300), and the Oil and Hazardous Pollution Contingency Plan for the Wind River Bighorn Basin District. Solid waste and used oil are defined and regulated under the Resource Conservation and Recovery Act (RCRA).

4.7.2 Alternative 2- No Action

Under the No Action Alternative, the development of the proposed Action would not occur. No resulting effects on public health or safety would be expected to occur beyond the current situation.

Livestock Grazing

4.7.3 Alternative 1- Proposed Action

Less than 1 AUM of livestock forage would be lost from the proposed mining claim development. No additional mitigation measures for livestock grazing necessary. 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.

4.7.4 Alternative 2- No Action

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

4.8 Wildlife

4.8.1 Alternative 1- Proposed Action

Mule deer, pronghorn antelope, and occasionally elk are known to use this area along with numerous raptors and grassland/shrubland passerines, predators, and prairie dogs that may be temporarily displaced by activity and noise associated with the mining operation. Some net loss of wildlife habitat may occur between initial surface operations and the completion of reclamation as the surface is displaced.

The operator has committed to protecting sage grouse nesting and early brood-rearing habitat by applying the seasonal stipulation prohibiting surface disturbing and/or disruptive activities from March 15 to June 30. This restriction applies to suitable sage grouse nesting and early brood-rearing habitat within 2 miles of the active sage grouse lek that is located west of the proposed project area. This stipulation applies only to those portions of the project area that lie within the 2 mile buffer and are found to be suitable for sage grouse nesting and early brood-rearing activities.

4.8.2 Alternative 2- No Action

Alternative 2 would not add to the effects that already exist in the area because the proposed bentonite mining would not take place.

4.9 Recreation and Visual Resources

4.9.1 Alternative 1 – Proposed Action

4.9.1.1 Recreation

Impacts to recreation from the proposed project are expected to be minimal. Impacts that may occur are conflicts between recreational visitors, such as hunters, and industrial operations, trespass issues onto surrounding private lands, and user displacement to alternative areas. Additional heavy machinery, primarily the bentonite hauling trucks on the routes, using the same access routes as recreational users will increase public health and safety issues and potential conflicts. However, with the current amount of bentonite traffic and presence, and the minimal amount of recreational use observed in the area, with the exception of the historic observed spike in use during hunting season, additional presence may not be observed.

4.9.1.2 Visual Resource Management

The proposed project will introduce new and contribute additional contrasting elements of line, form, color, and texture against the surrounding natural elements. These elements will be observed from the open pits, hauling routes, and the stockpiles and pits. The most evident contrasting element will be observed in the degree of change of form exhibited from the open mining pits, which may alter the forms' characteristics. These contrasts will be observed only in these areas, and only during excavation work. Similar contrasting elements are currently evident from the active bentonite mines within the same area. Due to the small project area, and compared to the current land uses within the surrounding area, these impacts to visual resources will be minor.

4.9.2 Alternative 2 (No Action)

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

4.10 Cultural Resources

4.10.1 Archeology

4.10.1.1 Alternative 1

A Class III cultural resources inventory of the project area identified no historic properties. The proposed project will have no effect on known historic properties. Standard cultural stipulations apply.

4.10.1.2 Alternative 2

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.

As per §43 CFR 3809.420 (8): *Cultural and paleontological resources.*

(i) Operators shall not knowingly disturb, alter, injure, or destroy any scientifically important paleontological remains or any historical or archaeological site, structure, building or object on Federal lands.

(ii) Operators shall immediately bring to the attention of the authorized officer any cultural and/or paleontological resources that might be altered or destroyed on Federal lands by his/her operations, and shall leave such discovery intact until told to proceed by the authorized officer. The authorized officer shall evaluate the discoveries brought to his/her attention, take action to protect or remove the resource, and allow operations to proceed within 10 working days after notification to the authorized officer of such discovery.

(iii) The Federal Government shall have the responsibility and bear the cost of investigations and salvage of cultural and paleontology values discovered after a plan of operations has been approved, or where a plan is not involved.

4.10.2 Paleontology

4.10.2.1 Alternative 1

Surface formations within the project area have a moderate sensitivity for paleontological resources and significant localities are not common. No impacts to paleontological resources are anticipated under Alternative 1. Standard paleontology stipulations apply.

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 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.

4.10.2.2 Alternative 2

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.

4.11 Cumulative Impacts

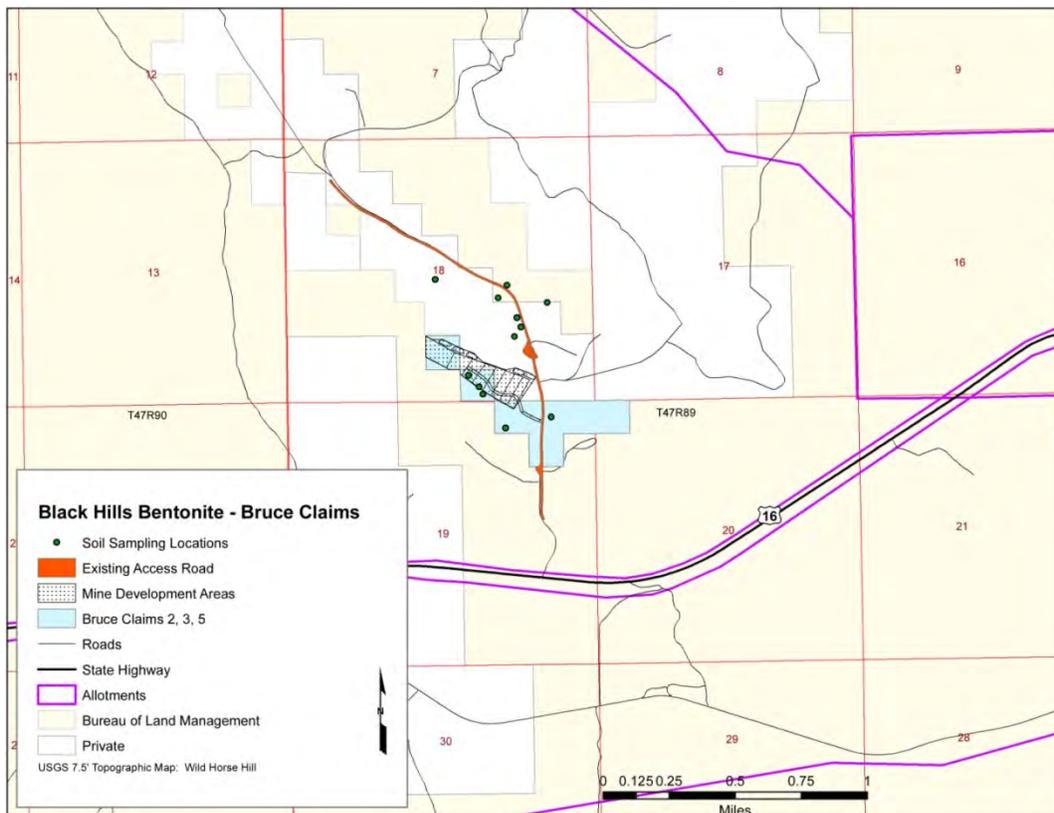


Figure 5: Cumulative effects area map.

Geology

In the cumulative effects area, there are:

- Total Cumulative Effects Analysis Area Acreage: 18,095
- Total Affected Area Acreage: 244.8 (1.4%)
- Total Reclaimed Area Acreage: 198.2 (1.1%)
- Total Bond Release Acreage: 196.9 (1.0%)

In 2010 Black Hills Bentonite reported 17,904 man hours worked at their Tensleep mine with 9 employees and a production of 131,981 bank tons of bentonite mined (Adcock, 2010). At their Worland processing plant, Black Hills Bentonite reported 11 employees with a production of 135,776 bank tons of bentonite processed (Adcock, 2010).

Using the 'Half-Strike' method for determining potential resources available results in a finding of approximately 291,879 ft³ of bentonite.

$$\therefore 2070 \text{ ft (approximate half strike length of the proposed project)} * 4.7 \text{ ft (combined thickness of bentonite in the Double Beds)} * 30\text{ft (maximum potential economic mining depth)} = \mathbf{291, 870 \text{ ft}^3}$$

One must render cubic feet in to yards:

$$291, 870 \text{ ft}^3 \div 27 \text{ ft}^3 / \text{yd}^3 = \mathbf{10, 810 \text{ yd}^3}$$

Therefore, 10,810 cubic yards of bentonite could be mined over the duration of this plan of operations. Mining of the proposed Bruce Claims #2, #3 and #5 Claims Mine Plan of Operations could result in 16,323.1 wet bank tons of material being permanently deleted from the total resources of bentonite in the Worland Field Office area over the life of the mine plan.

Previous sampling of the M8, M12 and M13 beds (the 'Commercial Bed' and the Double Beds, respectively) by the National Minerals Testing Laboratory located in Worland, WY resulted in the following calculation of specific gravity for those beds:

An average specific gravity (SG) of the bentonite was obtained by weighing those samples in air and then in water. The weight of the sample in air divided by the difference of the weight of the sample in water equals the specific gravity (SG). An average SG of 1.79 was obtained for those bentonite samples. This figure converts to:

$$(1.79)(62.4\text{lb}/\text{ft}^3 \text{ H}_2\text{O})(27\text{ft}^3/\text{yd}^3) \div 2000 \text{ lbs}/\text{ton} = \mathbf{1.51 \text{ tons}/\text{bank yd}^3}$$

$$\therefore 1.51 \text{ tons}/\text{bank yd}^3 * 10,810 \text{ yd}^3 = \mathbf{16, 323.1 \text{ wet bank tons}}$$

Hence, the proposed mine plan of operations could permanently deplete the bentonite resource in the proposed project area by 16, 323.1 wet bank tons of mineral. Potentially the increase in production could result in additional employment needs by Black Hills Bentonite.

5 CONSULTATION AND COORDINATION

5.1 List of all Persons, Agencies and Organizations Consulted

Air Quality Division, Wyoming Dept of Environmental Quality, Cheyenne and Lander Offices

Washakie County Planner, Worland, WY

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

Wyoming Game & Fish Department, 5400 Bishop Blvd., Cheyenne, WY 82006

Wyoming State Office, Bureau of Land Management

5.2 List of Preparers

The following Worland Field Office personnel reviewed or have been contacted with regard to this EA

<u>Name</u>	<u>Title</u>
Marit Bovee	Archaeologist
Marilyn Wegweiser	Geologist
Ted Igleheart	Wildlife Biologist
Cam Henrichsen	Range Management Specialist
Karen Hepp	T&E Plant/Range Management Specialist
Monica Goepferd	Civil Engineer
Carol Sheaff	Realty Specialist
Steve Kiracofe	Soil Scientist / Hazmat Specialist
Paul Rau	Outdoor Recreation Planner/VRM
CJ Grimes	Noxious Weeds
Jared Dalebout	Hydrologist
Eve Warren	NRS/Fuels

6 REFERENCES, GLOSSARY AND ACRONYMS

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