

ENVIRONMENTAL ASSESSMENT -- WY-010-EA10-08  
Bentonite Mine Plan of Operation  
WYW142434



December 2009

MISSION STATEMENT

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

BLM/WY/PL-10/002+1310

## TABLE OF CONTENTS

<b>ENVIRONMENTAL ASSESSMENT -- WY-010-EA10-08.....</b>	<b>1</b>
<b>1.0 INTRODUCTION .....</b>	<b>2</b>
1.1 PURPOSE AND NEED.....	2
1.2 DECISIONS TO BE MADE.....	2
1.3 CONFORMANCE WITH LAND USE PLANS .....	2
1.4 ISSUES IDENTIFICATION .....	2
<b>2.0 ALTERNATIVES, INCLUDING THE PROPOSED ACTION.....</b>	<b>4</b>
2.1 INTRODUCTION .....	4
2.2 ALTERNATIVE 1 (PROPOSED ACTION).....	6
2.2.1 <i>Plan of Operation</i> .....	6
2.2.1.1 Use of Existing Roads.....	6
2.2.1.2 Mining Operations .....	7
2.2.1.3 Reclamation .....	9
2.2.1.4 Operator committed practices .....	10
2.3 ALTERNATIVE 2 (PROPOSED ACTION WITH ADDITIONAL CONDITIONS OF APPROVAL (COA’S)) .....	11
2.4 ALTERNATIVE 3 (NO ACTION) .....	11
2.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY.....	11
<b>3.0 AFFECTED ENVIRONMENT .....</b>	<b>12</b>
3.1 LOCATION AND LAND OWNERSHIP .....	12
3.2 GEOLOGY.....	12
3.3 HYDROLOGY.....	12
3.3.1 <i>Surface Water / Surface Water Quality / Riparian</i> .....	12
3.3.2 <i>Ground Water / Ground Water Quality</i> .....	12
3.4 AIR QUALITY .....	12
3.5 SOILS .....	13
3.6 VEGETATION / INVASIVE PLANT SPECIES.....	14
3.7 LIVESTOCK GRAZING .....	15
3.8 WILDLIFE.....	15
3.9 THREATENED & ENDANGERED SPECIES.....	16
3.9.1 <i>Threatened, Endangered, Candidate, and BLM Sensitive -- Plant Species</i> .....	16
3.9.2 <i>Threatened and Endangered, Migratory, and BLM Sensitive – Wildlife Species</i> .....	16
3.10 RECREATION AND VISUAL RESOURCES .....	17
3.10.1 <i>Recreation</i> .....	17
3.10.2 <i>Visual Resources</i> .....	17
3.11 CULTURAL AND HISTORICAL RESOURCES .....	17
3.12 PALEONTOLOGY .....	17
3.13 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE.....	17
3.14 HAZARDOUS MATERIALS / PUBLIC HEALTH AND SAFETY .....	18
<b>4.0 ENVIRONMENTAL CONSEQUENCES.....</b>	<b>19</b>
4.0.1 <i>Critical Elements</i> .....	19
4.1 LAND USE.....	19
4.1.1 <i>Alternative 1 (Proposed Action)</i> .....	19
4.1.2 <i>Alternative 2 (Proposed Action w/COAs)</i> .....	19
4.1.3 <i>Alternative 3 (No Action)</i> .....	19
4.2 GEOLOGY.....	19
4.2.1 <i>Alternative 1 (Proposed Action)</i> .....	19
4.2.2 <i>Alternative 2 (Proposed Action with COA’s)</i> .....	20
4.2.3 <i>Alternative 3 (No Action)</i> .....	20
4.3 HYDROLOGY .....	20

4.3.1 Alternative 1 (Proposed Action).....	20
4.3.2 Alternative 2 (Proposed Action with COA's) .....	20
4.3.3 Alternative 3 (No Action) .....	20
4.4 AIR QUALITY .....	20
4.4.1 Alternative 1 (Proposed Action).....	20
4.4.2 Alternative 2 (Proposed Action with COA's) .....	20
4.4.3 Alternative 3 (No Action) .....	20
4.5 SOILS .....	21
4.5.1 Alternative 1 (Proposed Action).....	21
4.5.2 Alternative 2 (Proposed Action with COA's) .....	21
4.5.3 Alternative 3 (No Action) .....	21
4.6 VEGETATION / INVASIVE PLANT SPECIES .....	21
4.6.1 Alternative 1 (Proposed Action).....	21
4.6.2 Alternative 2 (Proposed Action with COA's) .....	22
4.6.3 Alternative 3 (No Action) .....	22
4.7 LIVESTOCK GRAZING.....	22
4.7.1 Alternative 1 (Proposed Action).....	22
4.7.2 Alternative 2 (Proposed Action with COA's) .....	22
4.7.3 Alternative 3 (No Action) .....	22
4.8 WILDLIFE.....	23
4.8.1 Alternative 1 (Proposed Action).....	23
4.8.2 Alternative 2 (Proposed Action with COA's) .....	23
4.8.3 Alternative 3 (No Action) .....	23
4.9 THREATENED, ENDANGERED, CANDIDATE, AND BLM SENSITIVE SPECIES .....	23
4.9.1 Threatened, Endangered, Candidate, and BLM Sensitive Species - Plants .....	23
4.9.1.1 Alternative 1 (Proposed Action).....	23
4.9.1.2 Alternative 2 (Proposed Action with COA's) .....	23
4.9.1.3 Alternative 3 (No Action) .....	24
4.9.2 Threatened, Endangered, Candidate, and BLM Sensitive Species - Wildlife.....	24
4.9.2.1 Alternative 1 (Proposed Action).....	24
4.9.2.2 Alternative 2 (Proposed Action with COA's) .....	24
4.9.2.3 Alternative 3 (No Action) .....	24
4.10 RECREATION AND VISUAL RESOURCES .....	26
4.10.1 Alternative 1 (Proposed Action).....	26
4.10.2 Alternative 2 (Proposed Action with COA's) .....	26
4.10.3 Alternative 3 (No Action) .....	26
4.11 CULTURAL AND HISTORICAL RESOURCES .....	26
4.11.1 Alternative 1 (Proposed Action).....	26
4.11.2 Alternative 2 (Proposed Action with COA's) .....	26
4.11.3 Alternative 3 (No Action) .....	26
4.12 PALEONTOLOGY .....	26
4.12.1 Alternative 1 (Proposed Action).....	26
4.12.2 Alternative 2 (Proposed Action with COA's) .....	27
4.12.3 Alternative 3 (No Action) .....	27
4.13 SOCIOECONOMIC.....	27
4.13.1 Alternative 1 (Proposed Action).....	27
4.13.2 Alternative 2 (Proposed Action with COA's) .....	27
4.13.3 Alternative 3 (No Action) .....	27
4.14 HAZARDOUS MATERIALS; PUBLIC HEALTH AND SAFETY .....	27
4.14.1 Alternative 1 (Proposed Action).....	27
4.14.2 Alternative 2 (Proposed Action with COA's) .....	27
4.14.3 Alternative 3 (No Action) .....	27
4.15 RESIDUAL IMPACTS OF THE PROPOSED ACTION .....	27
4.16 CUMULATIVE IMPACTS .....	28
<b>5.0 CONSULTATION AND COORDINATION .....</b>	<b>30</b>

5.1 LIST OF PREPARERS .....30  
5.2 PERSONS/AGENCIES CONSULTED.....30  
**6.0 REFERENCES .....30**  
**STIPULATIONS, MITIGATION AND MONITORING MEASURES.....31**  
CULTURAL AND PALEONTOLOGICAL STIPULATIONS.....31  
THREATENED & ENDANGERED SPECIES STIPULATIONS.....31  
MITIGATION MEASURES AND MONITORING .....31

**TABLES, MAPS, FIGURES**

MAP 1. GENERAL LOCATION OF PROPOSED DISTURBANCE AREAS.....5  
TABLE 1.1 PIT LOCATIONS, PROJECTED MINING DATES, DISTURBANCES. ....6  
TABLE 3.1 CONCENTRATIONS OF CRITERIA AIR POLLUTANTS AND BACKGROUND AIR QUALITY  
FOR THE BIGHORN BASIN PLANNING AREA (BLM, 2009).....13  
TABLE 3.2 SOIL SERIES CHARACTERIZATION AND DESCRIPTION.....14  
TABLE 4.1 CRITICAL ELEMENTS .....19  
MAP 4.1 – WYOMING GAME & FISH SAGE GROUSE CORE AREA .....25  
TABLE 4.2 PAST, PRESENT & FUTURE ACTIONS.....28

**Environmental Assessment -- WY-010-EA10-08  
Black Hills Bentonite Mining Plan of Operation  
WYW142434  
Washakie County, Wyoming**



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



**Operator:** Black Hills Bentonite, LLC

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

**Case serial number:** WYW142434

**Locations:**

<u>Legal Description</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>
NWSENW	12	47N	90W
NWSESE	12	47N	90W
S2SENW	12	47N	90W
NENESW	12	47N	90W
S2NWNWSE	12	47N	90W
NWNENE	13	47N	90W
SWSWNE	35	48N	90W
NWNWNW	18	47N	89W
NESWSE	12	47N	90W
S2SESE	12	47N	90W

Prepared by: Holly Elliott  
Date: December 2009

This EA incorporates the Proposed Mine Plan of Operations, and associated access, for the proposed action of mining for bentonite on unpatented mining claims pursuant to the Surface Management regulations at 43 CFR 3809. This plan of operation is assigned serial number WYW142434.

## **1.0 INTRODUCTION**

### **1.1 Purpose and Need**

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

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

This plan of operation would allow the operator the ability to mine and remove the minerals the operator has claimed pursuant to 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.

### **1.2 Decisions to be Made**

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

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

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

### **1.3 Conformance with Land Use Plans**

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

Remarks:

This plan has been reviewed to determine if the proposed action conforms to the land use plan as required by 43 CFR 1610.5. The Washakie RMP provides that plans of operations are required for locatable minerals development consistent with regulations (43 CFR 3809), on lands open to the staking of mining claims and operation of the mining laws for locatable minerals. (Record of Decision and Approved Resource Management Plan for the Washakie Planning Area, pg 12.)

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

### **1.4 Issues Identification**

A plan of operation was received by the Worland Field Office June 19, 2009. In accordance with 43 CFR 3809.411 the plan was reviewed and additional information was requested in correspondence dated July 16, 2009. Additional information was received October 28, 2009. It was determined that the EA in the matter of the plan would be made available for a comment period for at least 30 days in accordance with 43 CFR 3809.411(c).

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

<u>Name</u>	<u>Title</u>
Mike Bies	Archaeologist
Marilyn Wegweiser	Geologist
Ted Igleheart	Wildlife Biologist
Tim Stephens	
Cam Henrichsen	Range Management Specialist
Karen Hepp	T&E Plant Specialist
Monica Goepferd	Civil Engineer
Carol Sheaff	Realty Specialist
Steve Kiracofe	Soil Scientist / Hazmat Specialist
Paul Rau	Outdoor Recreation Planner/VRM
Rance Neighbors	Noxious Weeds Coordinator
Jared Dalebout	Hydrologist

## 2.0 ALTERNATIVES, INCLUDING THE PROPOSED ACTION

### 2.1 Introduction

BLM has received a Plan of Operations submitted by Black Hills Bentonite, L.L.C. (BHB); which includes new mining on both public and private lands. The “A-7” Plan amendment area is located approximately 6 miles west of Ten Sleep, in Washakie County, Wyoming. This new Plan of Operations proposes to add a total of 155.0 acres of land into their State of Wyoming mine permit boundary (Permit to Mine No. 281C - Amendment No. 7) including a total of 65.0 acres of public land, and 90.0 acres of private land.

Black Hills Bentonite holds a mining contract and mineral lease agreement with M-I Swaco (M-I) to mine the private lands within this project area as well as the mining claims within the project area that are held by M-I. Additionally, BHB is the claimant on two mining claims within the project area. The following tabulates the mining claims on federal acreage within the bounds of WDEQ-LQD Permit to Mine No. 281C – Amendment Area No. 7:

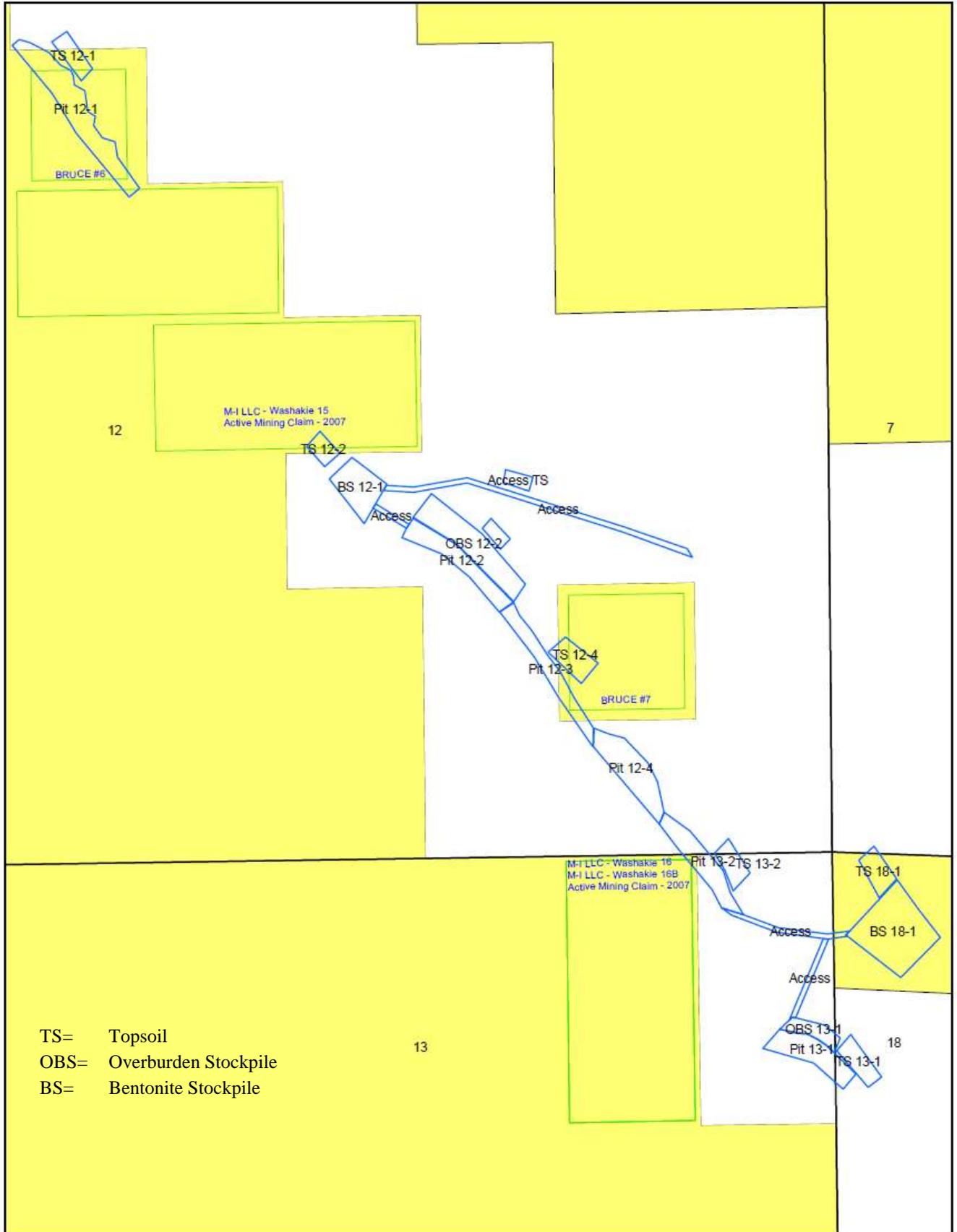
Claim Name	Serial No.	Legal Description	Section	T	R	Claimant
Bruce #6	297260	NWSENW	12	47N	90W	BHB
Bruce #7	297261	NWSESE	12	47N	90W	BHB
Washakie 14F	44037	S2SENW	12	47N	90W	M-I
Washakie 15	44038	NENESW, S2NWNWSE	12	47N	90W	M-I
Washakie 16B	44041	NWNENE	13	47N	90W	M-I
Washakie 11A	44023	SWSWNE	35	48N	90W	M-I

The total amount of public land proposed to be directly disturbed by mining and related activities on the A-7 area over the life of the mine is 3.3 acres. An additional 3.0 acres would be disturbed on public lands within the WDEQ/LQD previously approved and permitted boundaries of Permit 281C (Amendment 2). On the public land, new bentonite mining is proposed on the unpatented Bruce #6 and Bruce #7 claims held by BHB and the Washakie #11A, Washakie #14-F, a portion of Washakie #15 and a portion of Washakie #16B claims, all held by M-I Swaco with whom BHB has a Mining Lease Agreement. These lands are within an amended Wyoming Department of Environmental Quality (WDEQ) Permit 281C mine area. The total amount of private land proposed to be directly disturbed by mining and related activities over the life of the mine is 12.1 acres. The total amount of land (regardless of land status) proposed to be disturbed by mining and related activities, is 18.5 acres.

BHB was first issued Permit 281C by the WDEQ-LQD on March 24, 1975. Amendment #1 to this permit was approved in November 1975; Amendment #2 was approved in July 1976; Amendment #3 was approved March 23, 1992; Amendment #4 was approved November 9, 1994, Amendment No. 5 was approved on May 20, 1996 and Amendment No. 6 was approved on May 9, 1998. Incident Boundary Revision (IBR) No. 1 was approved on September 9, 1991, IBR No. 2 was approved August 14, 1992, IBR No. 3 was approved on May 6, 1993 and IBR No. 4 was approved on May 23, 1997. Amendment No. 7 is the seventh amendment to Permit 281C submitted to WDEQ-LQD and BLM.

**Map 1. General location of proposed disturbance areas.**

T47N R89W Sec 18; T47N R90W Sec 12, 13



**Table 1.1 Pit locations, projected mining dates, disturbances.**

The projected dates are only estimates and may change based on weather and market conditions.

PIT NUMBER	Projected Opening Date	Pit Area + associated disturbances (stockpile area, etc)
12-1	2010	3.8
12-2	2010	3.2
12-3	2011	1.0
12-4	2012	2.1
13-1	2010	1.9
13-2	2013	1.7
18-1	2010	3.0
Access	2010-2013	1.8
Total Acres		18.5

## **2.2 Alternative 1 (Proposed Action)**

The A-7 Plan amendment is anticipated to have a 10-year mine life. At present, there are no plans to mine the acreage in Section 35, T.48N. R.89W. (Area 1) The A-7 area is situated approximately 6 miles west of Ten Sleep, WY.

Mining in this area is proposed to take place along a narrow strip of land (approximately 100 feet wide) below a sandstone cap rock, adjacent to an unnamed ephemeral tributary of Big Cottonwood Creek. The proposed mining will begin at the southern terminus of an existing backfilled bentonite pit (Pit 01-1) in the SENWNW Section 12, T.47N. R.90W. and will progress from northwest to southeast across Section 12 and into the NE Section 13, T.48N., R.90W.

There will be two access points to the amendment area. Pit No. 12-1 will be accessed through an existing backfilled pit (Pit 01-1) in the NWNW Section 12, T47N, R89W. The other access will be via a haul road that will be constructed on the trace of an existing two track road that intersects with the existing main mine haul road on federal land in the NWNWNW Section 18, T47N, R89W.

### **2.2.1 Plan of Operation**

The plan of operation is on file in the Worland Field Office Branch of Minerals and Lands, and is considered an integral part of this Environmental Assessment (EA) by reference. The contents of the submitted plan are in accordance with the content requirements cited in 43 CFR 3809.401. The operator is concurrently filing certain mine plan information with the Wyoming Dept. of Environmental Quality - Land Quality Division.

#### **2.2.1.1 Use of Existing Roads**

No new right-of-way action would be necessary for the proposed project. The operator would employ BLM road building standards found in the BLM Manual Section 9113 when constructing haul roads. Access to the amendment area will be via Black Hills Bentonite's existing mine haul road that intersects with Highway 16, approximately six miles west of Ten Sleep, Wyoming.

The construction of new roads within the amendment area will be limited to secondary access roads. These roads will have a top width of twenty feet and a total width of fifty feet to allow for ditches along the roadside. Ditches will be approximately twelve (12) to eighteen (18) inches in depth to allow for drainage. Water turnouts will be constructed along the side ditches in order to disperse runoff and to minimize erosion. Water will be prevented from running down roadways and ditches into drainages at crossings.

Topsoil will be salvaged from the access roads and adjacent ditches to a maximum depth of eighteen (18) inches. Topsoil removed from the access roads will be stockpiled. All access roads will be reclaimed upon the completion of mining activities.

Either low water crossings will be constructed or properly sized culverts will be installed, as needed, during the

construction of the access roads. Typical construction details associated with the low-water crossing are illustrated in Figure MP-2. Construction details associated with culvert installations are illustrated in Figure MP-3.

### **Culvert Sizing for Ephemeral Drainages**

Four culverts and one low water crossing will be placed in ephemeral drainages and swales in conjunction with the construction of access roads associated with the mining activities. The locations of these culverts are illustrated on Map No. MP-1. The depth of cover over the culverts will be a minimum of twice the diameter of the culvert. The sizes of the culverts are presented in the following table:

#### **CULVERT SIZING INFORMATION**

<u>Culvert/LWC</u> <u>Location</u>	<u>Drainage Area</u> <u>Above Culvert</u>	<u>Peak Discharge</u> <u>In C.F.S.</u>	<u>Culvert</u> <u>Installed</u>	<u>Size</u>	<u>Slope</u> (ft/ft)
#1	5 Acres	<10		18"	.03
#2	5 Acres	<10		18"	.03
#3	1654 Acres	90		42"	.03
#4	992 Acres	65		36"	.03
#5	2791 Acres	>100		Low Water Crossing	

Peak discharge information for proper culvert sizing is based on information presented in the U.S.D.A./Soil Conservation Service Publication SCS-TP-149, "A Method for Estimating Volume and Rate of Runoff in Small Watersheds," January 1968. Peak discharge rates are based on the SCS Curve Number Method using the following criteria:

Type II Storm Distribution  
 Land Use: Pasture or Range, No Mechanical treatment  
 Hydrologic Condition: Fair  
 Hydrologic Soils Group: C (from SCS Handbook NEH-4)  
 Rainfall Event: 10 Year, 24 Hour, 1.4 inches based on Wyoming Isopluvials  
 Moderate Slopes  
 Curve Number: 79

Culvert sizes are based on culvert sizing charts provided by Mr. John Hunzicker, Geotech Industrial Supply, Casper, Wyoming.

### **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 would be addressed on a site specific basis using fencing or other methods determined to be appropriate for the conditions.

#### **2.2.1.2 Mining Operations**

##### **Mining Methods**

Bentonite mining on the amendment area will consist of a series of pits arranged in multiple cut sequences. Topsoil would be removed from all affected areas utilizing scrapers and dozers. Topsoil would 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 areas instead of being placed in stockpiles.

Following the removal of topsoil, the exposed overburden would be ripped using dozers. The overburden would then be removed from the pit using scrapers. Overburden from the first pit in a multiple cut series of pits would be placed in an out-of-pit overburden stockpile. Overburden from each subsequent pit would be directly backfilled into the adjacent open 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 which will be constructed on the backfilled pit areas and the out-of-pit overburden stockpile.

### **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) equipment parking 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 ranging from zero (0) to sixty (60) inches. In the event that overburden material is encountered that appears suitable as a topsoil substitute, this material may also be salvaged and stockpiled at the discretion of the operator.

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

Topsoil would also be removed from the edges of all pits in order to create topsoil “buffer area” approximately thirty feet wide. 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.

All topsoil stockpiles would be conspicuously identified with signs. Topsoil stockpiles which would remain in place for more than one year will be seeded with the approved permanent seed mixture. Seeding of stockpiles would be conducted in the spring or fall, whichever season follows the placement of the stockpile.

### **Overburden Handling**

Overburden removed from the pit areas would 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 would 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 would remain as a permanent reclamation feature.

The top 12 to 24 inches of overburden would be removed with scrapers and stockpiled on or adjacent to the remainder of the overburden, on the overburden stockpile areas illustrated on the mine plan map. This material would be identified and signed as “Segregated Overburden.” Segregated overburden would 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 poorest quality overburden.

Overburden would be backfilled in order to restore mined and affected areas to their approximate original contour (AOC). Once the overburden is backfilled, it would be graded and contoured to achieve AOC. Final slopes would be no steeper than 4(H):1(V) and all reclaimed areas would drain in order to prevent ponding of water. Topsoil would be reapplied to the approximate original depth.

Waste bentonite, commonly referred to as “cleanings,” which remain on the overburden stockpile areas after the stockpiled bentonite has been removed, would be disposed of by placing this material at the base of a high wall 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.

### **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 for processing.

**Power Transmission Lines, Communication Lines and Pipelines**

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

**Sedimentation and Treatment Ponds**

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

**Mill and Tailings Disposal Sites**

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

**Drainage Diversions**

No permanent drainage diversions are proposed for the amendment area. Surface flow may be diverted on the up-slope side of pits and other affected area to prevent accumulation of water in pits, and to prevent down slope sedimentation. The diversion of surface flows would be accomplished by constructing small v-ditches on the up-slope side of pits to divert surface flows away from these areas. These small v-ditches would normally be constructed with a motor grader or a dozer. Topsoil would be removed and stockpiled prior to constructing drainage diversions. If erosion occurs on the diversion areas, these sites would be seeded with a temporary seed such as barley or winter wheat to provide soil stabilization. Straw bales or water bars may also be used to stabilize erosion.

**Solid Waste Disposal**

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

**Railroads and Conveyor Systems**

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

**Overburden and Bentonite Stockpiles**

Out-of-pit overburden and bentonite stockpiles would be constructed in conjunction with the mining activities conducted on this amendment area. Out-of-pit overburden stockpiles are normally only constructed in conjunction with the overburden removed from the first pit mined in an adjoining series of connected pits (multiple cut sequence).

Bentonite stockpiles would be developed in order to field dry the bentonite exposed in each pit. These bentonite stockpiles are usually placed on either the overburden stockpile or the backfilled portion of previously mined pits in order to reduce impacts to the land.

**2.2.1.3 Reclamation**

Reclamation of the mined areas would focus on rehabilitation of wildlife habitat and livestock grazing, which constitute the pre-mine land uses. Reclamation of disturbed areas would take place concurrently with mining operations as much as possible, but would generally begin within three years, and be completed within five years of the date the land was first affected. Topsoil areas would be seeded as soon as possible. If, due to weather or other circumstances, a fall seeding with the permanent seed mixture is not possible, the area would be seeded with a small grain such a barley, winter wheat or millet the following spring in order to establish a cover crop.

During mining operations, BBH would salvage all available topsoil and subsoil from all A-7 pit series. These soils would be salvaged according to the soil salvage recommendations in A7 - Plan of Operation - Appendix D-7 (Soils). After stockpiling, the piles would be stabilized using contour tilling and seeding with the approved permanent seed mix as appropriate. Soil would be direct haul “live-spread” on backfilled pits wherever possible, to reduce stockpiling times.

Proposed access roads have been developed to minimize the impact on the ephemeral drainages. For situations where roads will cross ephemeral drainages, either low-water crossings would be constructed or culverts would be installed. The minimum culvert size allowed would be eighteen (18) inches in diameter.

Other types of erosion control and prevention practices that BHB proposes to use during mining and reclamation activities include use of straw bale sediment traps, and drilling or harrowing along contour to reduce rilling. Post-mine, BHB would remove any temporary sediment barriers, and reestablish drainages. Channels would be reconstructed in approximately the original location, and at least the same length and gradient as pre-mine features. Channels would be seeded perpendicular to water flow. If excessive erosion is anticipated, water bars and/or straw bales may be installed and left in place to encourage channel meandering over time.

BHB would use only certified weed-free seed, and seeding of all disturbed areas would take place between October 1 and November 30 of each year in areas where topsoil has been replaced. A seed mix approved by both the LQD and BLM would be used to reseed reclaimed areas. Seed would be planted utilizing a standard grain drill or a no-till drill.

If necessary, newly reclaimed (seeded) areas would be fenced to protect these areas from grazing by livestock. If fences are constructed, they would be constructed to allow for the egress and ingress of wildlife species. Any fences would be removed after release of the reclamation bond, if the surface owner requests it. Extended vegetation reference areas would be used in the A-7 Plan to assist in determining when or if bond release is acceptable to LQD and BLM. Alternatively, other procedures agreed upon with WDEQ/LQD may be used to measure reclamation success.

#### **2.2.1.4 Operator committed practices**

##### **Interim Management Plan**

Periods of inactivity may occasionally occur on the A-7 area, when earthmoving equipment is moved to different portions of the permit area as needed, to provide the plant with certain types of clay. BHB would, during periods of inactivity, control surface runoff into pit areas, containment basins, berms, and topsoil protection. Inactive mine areas would be left in a safe, stable and clean condition. Occasionally a piece of heavy equipment may be left in a pit area while waiting for parts. During periods of mining suspension, all pit highwalls, drainages, overburden areas, and points of potential runoff would be stabilized and monitored.

##### **Monitoring Plan**

BHB proposes to monitor the mine site for excessive erosion, and prevent surface water runoff that could transport sediment from the mine areas throughout the life of the mine. Critical phases of the operation to be monitored include surface water runoff, mine area drainage and berm stability, haul road stability, highwall stability, potential fuel spills or potential unnecessary or undue degradation. Highwalls would be monitored for raptor nests, and any instances of wildlife mortality due to the mining would be recorded and reported to the Wyoming Game and Fish Department. Other wildlife monitoring would be conducted as required by BLM or WDEQ-LQD.

##### **Spill Management Plan**

BHB has addressed spill prevention and management under the Wyoming DEQ Storm Water Pollution Prevention Plan for Permit 281C, to address such leaks, or any spills of hydrocarbons on the mine sites.

##### **Sediment Control**

Surface runoff would be directed around and away from mining activities in order to prevent unnecessary erosion and sedimentation. Final contouring would be done in order to return the affected lands to the approximate original contour. The disturbed areas would be monitored for erosion.

##### **Noxious Weed Management Plan**

The disturbed areas would also be monitored for the presence of noxious weed species which may need to be controlled.

##### **Protection of Cultural and Paleontological Resources**

During the cultural resources inventories conducted on the project area, two cultural features (Features #1 and #5)

within one previously described site (48WA1205) were identified as contributing features to eligible site 48WA1205. At the recommendation of Worland Field Office BLM archaeologist, these sites have been fenced and would be marked on the ground as “No Disturbance” areas. Mine activities have been designed in order to avoid the features. Additionally, one site (48WA2183) was described during the cultural resources survey conducted in April 2009 by ARC, Inc. as “unevaluated” pending further testing. This site would be fenced and marked as a “No Disturbance Area.” Mining activities have been designed in order to avoid disturbance of this site.

Any cultural or resources (historic or prehistoric site or object or fossil) discovered by the holder, or any person working on his behalf, on private, State or Federal lands shall be immediately reported to the authorized officer. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery would be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific materials. The holder would be responsible for the cost of evaluation and any decision as to proper mitigation measures shall be made by the authorized officer after consulting with the operator.

### **Wildlife**

Raptor nests- Future mining would be conducted in order to minimize impacts to any nests that are currently present and any nests that may become established during the breeding season of February through July. Migratory Birds of High Federal Interest (MBHFI) species were not common on the study area but would be protected wherever they are found. In the event that a raptor nest is established on or immediately adjacent to the amendment area and it becomes necessary to "take" or remove a raptor nest, the U.S. Fish and Wildlife Service would be contacted as soon as a "take" situation is anticipated. Sufficient lead time would be allowed for developing and implementing a mitigation plan, and to avoid disrupting the mining operation.

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

In the event that a threatened or endangered species is observed on or immediately adjacent to the amendment area, the U.S. Fish and Wildlife Service - Endangered Species Office located in Cheyenne, Wyoming would be contacted and the observations would be reported.

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

Based on BLM staff specialists input, certain conditions of approval, allowable under the 3809 regulations, would be necessary and proper to provide adequate protection of resource values. This may include adjusting the mine plan operation as proposed by BHB such as requiring avoidance of selected areas, or requiring placement of topsoil, subsoil, overburden stockpiles in substantively different location(s) than proposed in the current Plan. Stipulations and mitigation measures would also be included under this alternative.

### **2.4 Alternative 3 (No Action)**

No action implies that on-going development and other land use activities would be allowed to continue in the area, but the proposed action would be disapproved. Actions on private lands with private mineral ownership would not be affected by not approving this action. Additional plans of operation would be considered by the BLM on a case-by-case basis.

### **2.5 Alternatives Considered but Eliminated From Detailed Study**

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

## **3.0 AFFECTED ENVIRONMENT**

### **3.1 Location and Land Ownership**

The proposed bentonite pits and related roads are located in Washakie County Wyoming, and 6th principal meridian. Legal descriptions are found in on the cover page of this document. The pits would be located on lands owned and managed by the federal government (BLM) and private lands.

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

### **3.2 Geology**

This Plan amendment area is located in the southeastern Bighorn Basin, Wyoming, in an area where the dominant land uses are bentonite mining, wildlife habitat, and livestock grazing. The Plan area is situated on western dipping slopes of Cretaceous age marine sands and shales of the lower Frontier and upper Mowry formations.

Bentonite is the only known locatable mineral resource in the area of the Proposed Action. There are no active oil and gas leases located in the area, nor any other known leasable mineral resources in the area.

Formations exposed in the A-7 area include the lower Cretaceous Mowry and Frontier Formations.

This bentonite-bearing strata is generally composed of sodium bentonite beds of varying thicknesses, interbedded with gray, marine shales and claystones which were deposited in the Cretaceous Interior Seaway.

### **3.3 Hydrology**

There exists a 0.81 mile of an ephemeral stream segment that flows through private and public land within the amendment area. This stream channel is an unnamed tributary to Big Cottonwood Creek, which is located downstream from the pit 12-2 boundary, and another segment adjacent to pit 12-1 boundary area of proposed disturbance. The stream was evaluated by the BLM to determine if any wetland or riparian environment is present within the proposed disturbance. The affected environment will be from haul truck traffic, road crossings, and placement of culverts within the channel. In several areas particularly below culverts large washout pools have formed from road crossings in the area. The stream segment was found to have minor amounts of flow when visited in the field during traditionally dry conditions in late fall of 2009. This segment was also evaluated in 2003 in the field by Intermountain Resources using the 1987 US Army Corp Engineers Wetland Determination Manual to determine if the area meets any conditions suitable to a wetland or Waters of the US, by defining the hydrology, soils, and vegetative components. This stream segment may have exhibited a change in flow regime from ephemeral to intermittent, due to the recent change in climatic conditions from 2009 as a normal precipitation year, from 2003 that experienced moderate to extreme drought conditions locally.

#### **3.3.1 Surface Water / Surface Water Quality / Riparian.**

There are no live streams or reservoirs within the amendment area. No surface waters will be affected by the proposed mining on the A-7 area.

#### **3.3.2 Ground Water / Ground Water Quality**

Due to the shallow mining depths (35-40 feet) groundwater should not be encountered as a result of the proposed new mining activity. No known or defined aquifers are situated within the geologic units proposed to be mined in this area. Exploratory developmental drilling in this area has also confirmed that all mining will take place in the vadose (unsaturated) zone above the local and regional water table.

### **3.4 Air Quality**

No site-specific air quality data are available from the plan of operation area. There is general information about Bighorn Basin-wide background air quality as shown in the Table 3 below (BLM, 2009). The plan area is within the southern part of the Bighorn Basin. The background air quality within the basin is in compliance with state and national ambient air quality standards as listed in Table 2. The air-shed within the proposed plan area is classified as PSD Class II (Prevention of Significant Deterioration; Wyoming DEQ, 2008). The PSD program under the Clean

Air Act ensures air quality in areas with clean air does not significantly deteriorate, while maintaining a margin for future industrial growth. In PSD II areas, moderate incremental increases in pollutant concentrations are allowed, although the concentrations are not allowed to reach the concentrations set by the Wyoming and National Ambient Air Quality Standards as listed on the table.

**Table 3.1 Concentrations of Criteria Air Pollutants and Background Air Quality for the Bighorn Basin Planning Area (BLM, 2009)**

Pollutant	Averaging Time	NAAQS ( $\mu\text{g}/\text{m}^3$ )	WAAQS ( $\mu\text{g}/\text{m}^3$ )	Background ( $\mu\text{g}/\text{m}^3$ )	Data Source
Carbon Monoxide (CO)	1 hour <sup>1</sup>	40,000	40,000	1,979	Data collected from Yellowstone National Park, WY near 'Old Faithful' geyser during 2005.
	8 hour <sup>1</sup>	10,000	10,000	931	
Nitrogen Dioxide (NO <sub>2</sub> )	Annual (Arithmetic Mean)	100	100	3.4	Thunder Basin National Grassland
Ozone (O <sub>3</sub> )	1 hour <sup>2</sup>	235	235	169	
	8 hour <sup>3</sup>	157	157	141.3	
Particulate Matter (PM <sub>10</sub> ) <sup>8</sup>	24 hour <sup>4</sup>	150	150	N/A	Wyoming Department of Environmental Quality (DEQ), State and Local Air Monitoring Station (SLAMs)
	Annual (Arithmetic Mean) <sup>5</sup>	Revoked Dec. 2006	50	16.1 18.6	
Particulate Matter (PM <sub>2.5</sub> ) <sup>8</sup>	24 hour <sup>6</sup>	35	65	11 3.9	DEQ SLAMs
	Annual <sup>7</sup>	15	15	3.3 7.5	
Sulfur Dioxide (SO <sub>2</sub> )	3 hour <sup>1</sup>	1300	695	93	Data collected at the Lost Cabin Gas Plant – preconstruction monitoring in Fremont County, WY 1986-1987.
	24 hour <sup>1</sup>	365	260	32	
	Annual (Arith. Mean)	80	60	4	

1 Not to be exceeded more than once per year.

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

3 To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 157  $\mu\text{g}/\text{m}^3$ .

4 Not to be exceeded more than once per year on average over 3 years.

5 Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM<sub>10</sub> standard in 2006 (effective December 17, 2006).

6 To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35  $\mu\text{g}/\text{m}^3$  (effective December 17, 2006).

7 To attain this standard, the 3-year average of the weighted annual mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors must not exceed 15.0  $\mu\text{g}/\text{m}^3$ .

8 Particulate matter data collected by Wyoming DEQ-Air Quality Division (AQD) at Emerson Building, Cheyenne, Wyoming, Year 2001, second highest 24-hour concentrations. These data were determined by Wyoming DEQ-AQD to be the most representative co-located PM<sub>10</sub> and PM<sub>2.5</sub> data available.

The primary air-borne pollutant within the plan of Operation area is Particulate Matter (PM) in the form of fugitive dust (uncontrolled wind-carried particulates) generated from natural and human sources. Particulate matter includes dust, soot and other tiny bits of solid materials that are released into and move around in the air. Particulates are produced by many sources, including burning of diesel fuels by trucks and buses, incineration of garbage, mixing and application of fertilizers and pesticides, road construction, mining operations, agricultural and forest burning, and operation of fireplaces and woodstoves. There are no air quality monitoring stations within Washakie County so there is no local background air quality information available. The closest ones are in Cody, Sheridan, Lander and Casper (Wyoming DEQ, 2008). No monitoring of past and current open pit bentonite mines have been conducted, so quantitative information about pollutant emissions as listed in Table 3.1 are not available.

### **3.5 Soils**

The soils reflect the desert environment and the parent material over which they formed. The ecological sites supported by these soils indicate that the region is in the lower range of the 10 to 14 inch precipitation zone.

These soils are typified by a light brown surface layer. Surface textures are loams, clay loams, sandy loams, and

sandy clay loams. Subsoil textures are very similar. The subsoil often reflects an increase in clay content and calcium carbonate, being expressed as an argillic or calcic horizons. Strong alkalinity (pH > 8.5), salinity and high SAR values are common.

When the native vegetation is intact, these soils are not prone to runoff and erosion. Based on calculations generated by the U.S. Forest Service web-based Water Erosion Prediction Project (WEPP), Disturbed WEPP model, runoff and erosion is minimal when the native vegetation has not been disturbed.

Enhanced soils mapping was conducted by Intermountain Resources in 1992 with revisions made in 1994 and 2008. This enhanced mapping is closely correlated to the original soils mapping conducted by NRCS (formerly Soil Conservation Service) and published in Soil Survey of Washakie County Wyoming.

Two map units characterize the area proposed to be mined. The first is Map Unit 35 – Kishona-Shingle Association; included in this map unit are significant inclusions of the Forkwood and Haverdad soil series. The second map unit 84 - Youngston-Uffens-Lostwells Complex. The table below summarizes the characteristics of these soils.

**Table 3.2 Soil Series Characterization and Description**

Soil Series	Soil Depth (inches)	Surface/Subsoil Textures	Ecological Sites	Limiting Features	Salvage Depth (inches)
Kishona	>60	loam thru-out profile	Saline Upland 10-14	strong alkalinity below 44"	44
Shingle	10-20	loam or sandy loam over loam, sandy loam and clay loam	Shallow Clayey 10-14	shallow depth	13
Forkwood	40-60	sandy loam and sandy clay loam thru-out profile	Loamy 10-14	high SAR below 14"	14
Haverdad	40-60	clay loam and silty clay loam thru-out profile	Shallow Loamy 10-14	strong alkalinity below 6"	6
Youngston loam	>60	loam over sandy loam & loam	Saline Upland 10-14	strong alkalinity and high salinity	24
Uffens clay loam	40-60	loam over clay loam and sandy clay loam	Saline Upland 10-14	strong alkalinity and high salinity	24
Lostwells sandy clay loam	>60	sandy clay loam thru-out profile	Loamy 10-14	strong alkalinity and high salinity	24

Detailed soils data is located in the Plan of Operations for Black Hill Bentonite, North Tensleep Area, Permit to Mine No. 281-C, Amendment No.7; located in appendix D-7.

### **3.6 Vegetation / Invasive Plant Species**

Intermountain Resources completed vegetation baseline studies for the A-7 area during 2003. Vegetation types were delineated, species lists and sampling design information were provided with the application. Four different vegetation map units were described for the A-7 area.

According to information provided in the A-7 WDEQ/LQD application (Plan of Operations binder) (Appendix D-8 Vegetation), four general vegetative communities and disturbed land are found within the A-7 area and are described below, based on the field inventories:

**(1) Bottom Land Shrub (Comprises 21.9% of the A-7 study area or about 34.0 acres)** Vegetation sampling on bottomland shrub sites on the A-7 area show that annual forbs made up approximately 19.8% of the absolute vegetation cover while perennial grasses make up about 13% of the total absolute vegetative cover for this type. This vegetation type was dominated by annual forb species, particularly fireweed summercypress (*Kocia scoparium*). Alkali sacaton (*Soborobolus airoides*) was the most common perennial grass species recorded on this vegetation type. Other common plant species recorded on this type included big sagebrush (*Artemisia tridentate*), black

greasewood (*Sarcobatus vermiculatus*) and desert alyssum (*Alyssum desertorum*). Annual grass and annual forb species made up about 23.8% of the total absolute vegetation cover on this vegetation type. This vegetation type exhibited the highest total vegetation cover when compared to the other vegetation types surveyed on this A-7 area in 2003, but almost ½ of the cover was comprised of annuals. Shrub density on this type was dominated by big sagebrush. No subshrub species were encountered in transects on this vegetation type. Total density on this vegetation type was 0.73 plants per square meter.

**(2) Sagebrush Shrublands (Comprises 53.0% or about 82.2 acres of the A-7 area)** The sagebrush shrubland map unit was the most common type on the A-7 area. Vegetation sampling on the sagebrush shrubland sites area show that shrub species make up approximately 14.6% of the absolute vegetation cover while perennial grasses make up about 14.4% of the absolute vegetative cover for this type. Big sagebrush was the most common plant species recorded on this type. Needleandthread (*Stipa comata*) was the most common perennial grass species recorded on this vegetation type. Other common plant species recorded on this type included the annual grass cheatgrass (*Bromus tectorum*), Sandberg bluegrass (*Poa secunda*) and bluebunch wheatgrass (*Agropyron spicatum*). Annual grass and annual forb species made up about 11.2% of the total absolute vegetation cover on this vegetation type. Shrub density on this type was dominated by big sagebrush. Other dominant shrub and subshrub species recorded on this area were broom snakeweed (*Gutierrezia sarothrae*), prickly gilia (*Leptodactylon pungens*), black greasewood and winterfat (*Ceratoides lanata*). The density of shrub species on this vegetation type was 1.20 plants per square meter while the subshrub species made up approximately 0.09 plants per square meter for an overall density of 1.29 plants per square meter.

**(3) Outcrop Barrens (Covers 14.7% or about 22.8 acres of the proposed A-7 area)** Cover data showed that vegetation was somewhat sparse, but species diversity appeared to be good. Perennial grasses dominated the life forms recorded on this area at about 5.2% absolute cover. Rubber rabbitbrush was the dominant plant species recorded on this vegetation type followed by big sagebrush, Fendler threeawn (*Aristida fendleriana*), shortstem wildbuckwheat (*Eriogonum brevicaulis*) and Sandberg bluegrass. Annual grass and annual forb species made up 1.4% of the total absolute vegetation cover for the outcrop barrens vegetation type. Shrub density on this vegetation type was dominated by shrubs (0.59 plants per square meter). Subshrub species exhibited 0.26 plants per square meter. Rubber rabbitbrush was the most common species recorded in shrub density transects followed by shortstem wildbuckwheat and big sagebrush.

**(4) Rock Outcrop (Covers 9.9% or about 15.3 acres of the A-7 area)** The rock outcrop unit was the smallest of the types which were sampled and mapped on the A-7 area in 2003. The rock outcrop vegetation type is made up primarily of annual grass (7.0% absolute cover) and perennial grasses (5.2% absolute cover). The 2003 cover data for the rock outcrop vegetation type showed that vegetation was limited and species diversity appeared low. The most dominant species recorded on this vegetation type was the annual grass, cheatgrass. Other common species recorded on this type were big sagebrush, needleandthread, hairy goldenaster (*Heterotheca villosa*) and slimflower scurfpea (*Psoralea tenuiflora*). Shrub density on this vegetation type was dominated by shrubs (0.18 plants per square meter). Subshrub species exhibited 0.03 plants per square meter on this vegetation type. The total density of this type was 0.21 plants per square meter. Big sagebrush was the most common species recorded in shrub density transects followed by prickly gilia and broom snakeweed.

**(5) Disturbed Land (Comprises 0.5% of the A-7 Area)** This map unit is comprised of an access road from the original 281C permit area

### **Invasive Species**

Noxious weeds documented to exist in the area of the proposed mining activities include Saltcedar. These plants are primarily associated with existing reservoirs and low areas where water is captured. Other noxious weed species documented to exist in the area include Russian knapweed and Canada thistle. Cheatgrass occurs across area in varying abundances. However, visual observation indicates that perennial grasses are still present with adequate densities and cheatgrass densities are not limiting perennial grass productivity or diversity.

### **3.7 Livestock grazing**

This project is within the Big Cottonwood Creek Allotment (#00132). The allotment is permitted for 500 Cattle, 05/05-06/08 and 400 Cattle, 10/15-12/02.

### **3.8 Wildlife**

The Wyoming Game and Fish Department (WGFD), as well as the U.S. Fish and Wildlife Service (USFWS) were

also consulted regarding wildlife in the general area of this Plan. The USFWS was consulted regarding the results of IMC's wildlife surveys. USFWS found the surveys and analyses of impacts to be satisfactory.

**BIG GAME:** The A-7 area is classified by the WGFD as yearlong and winter-yearlong seasonal range for pronghorn. Crucial pronghorn winter range is not found within the proposed A-7 area.

Mule deer were most common in sagebrush plant community types in the proposed amendment area. The proposed A-7 acreage in Section 12 and 13 is classified as yearlong seasonal range for mule deer by the WGFD. Crucial mule deer winter range is located in Section 35 within the A-7 study area; however BHB has no plans to mine this area.

The WGFD has mapped the amendment area. It is generally out of white-tailed deer range. White-tailed deer are known to inhabit the area as transients and none were observed during wildlife surveys. Crucial white-tailed deer winter range does not exist within the A-7 area.

The study area is generally located out of the normal habitat use for elk, according to WGFD maps. However elk sign was observed about one mile east of this A-7 area during the 2008 surveys.

**RAPTORS:** Raptors observed in the study area as transients include the bald eagle, golden eagle, Swainson's hawk, rough-legged hawk, ferruginous hawk, northern harrier and American kestrel. No raptor nest sites were recorded in the proposed A-7 area itself, but several nest sites were within one mile of the amendment area.

IMR provided a list of nest sites identified within one mile of the A-7 area. A list of these nests is provided in the A-7 mine plan. In 2008 the golden eagle, Swainson's hawk, red-tailed hawk and ferruginous hawk nests were not intact, having been destroyed by natural attrition. Active nests in 2008 included the red-tailed hawk, prairie falcon and great horned owl.

**OTHER BIRDS:** Species of game bird that have been documented using the A-7 study area include the chukar partridge, gray partridge, ring-necked pheasant, sage grouse and mourning dove. IMR reported that none of these species were abundant and only the mourning dove was common.

No sage grouse leks were identified on or within one mile of the A-7 area during any of the wildlife surveys conducted by IMR. A potential sage grouse lek was observed within two miles of the amendment area during the March and April 2008 surveys. This site is located in the NWSE4 Section 14 T47N R90W. During the March 2008 survey three males and three females were observed at this site. During the April 2008 survey six males were seen at this site.

**MIGRATORY BIRDS OF HIGH FEDERAL INTEREST (MBHFI):** The A-7 area provides habitat for a limited number of MBHFI species. Recorded on site were the Swain's hawk, sage grouse, ferruginous hawk, Brewer's sparrow and sage sparrow.

Bald eagles winter in the area and also migrate through the site. Bald eagles were not observed during the 2003, 2004 or 2008 survey periods and roost or nesting habitat is not present on the A-7 area. The Swainson's hawk and ferruginous hawk were uncommon. The Swainson's hawk and ferruginous hawk were observed as transients and have not been recorded nesting on or within one mile of the A-7 area for several years. The Brewer's sparrow was occasional to common and nests on the study area.

Specific surveys were completed for mountain plovers in late April of 2003, April 2004 and April through June of 2008. The areas to be affected were surveyed and suitable habitats in the A-7 area and adjacent areas were also surveyed by ATV. No mountain plovers were observed in the area and the site provides very little preferred habitat for this species.

### **3.9 Threatened & Endangered Species**

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

There are no known Threatened, Endangered, or BLM Sensitive species identified in this project area.

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

The bald eagle was removed from the Threatened list in 2007 but may use the study area. This species winters in the region and migrates through the site. No roosts sites have been identified on the study area and roost habitat is not

present. Nesting habitat (large trees in proximity to water bodies containing fisheries) for bald eagles does not exist within the study area. Bald eagle nests or winter concentration sites are not known to occur in adjacent areas.

Prairie dog towns do not exist within the proposed amendment area so black-footed ferrets would not be affected by this project. White-tailed prairie dog towns can be found east of the A-7 area.

### **3.10 Recreation and Visual Resources**

#### **3.10.1 Recreation**

The proposed project is located within the Extensive Recreation Management Area (ERMA) where natural recreational resources and settings aid in supporting recreational opportunities and realized benefits, but recreational resources and associated uses are not the predominant use/resource. Recreation management is of a custodial nature where management addresses resource protection, use and user conflicts, and public health and safety. There currently exists a dominant industrial presence from the current bentonite extraction activities, which, by nature of choice of the recreating visitors, precludes much recreation uses in this area. Recreation activities of those who do wish to recreate in this area include, driving for pleasure, hunting, sightseeing, wildlife viewing, rock hounding, and hiking/exploring. The area is currently managed as motorized use limited to existing roads and trails.

#### **3.10.2 Visual Resources**

The project is within designated VRM IV area. Class IV – changes in the basic elements of the landscape can attract attention and may be dominant features of the landscape in terms of scale, but the changes should repeat the form, line, color, and texture of the characteristic landscape.

There are no Areas of Critical Environmental Concern or Wilderness Areas in the vicinity of the project area.

### **3.11 Cultural and Historical Resources**

Cultural files searches and Class III Cultural Resource inventories were conducted in 2009, on the public and private lands involved in the proposed A-7 Plan area (BLM project numbers 1509041Y and 151002Y).

The survey of these lands included revisiting 1 site and recording 4 new sites and 1 isolated find. Two features of a previously recorded site are determined eligible for the National Register of Historic Places (NRHP). Five sites are recommended not eligible for the NRHP. One site is left unevaluated pending additional testing and research. All sites are located in areas that would not be disturbed by construction. The proposed project will have no adverse effect on the eligible sites or the unevaluated site as long as the contributing elements of the eligible site and the unevaluated site are fenced and avoided. The proposed project would avoid the unevaluated site and the contributing elements of the eligible site.

### **3.12 Paleontology**

The Mowry Shale, proposed to be mined under this Plan, has yielded vertebrate fossils of marine reptiles and other vertebrates at other sites within the Bighorn Basin, and fossilized fish scales are abundant in some Mowry strata. However, no known significant paleontological resources have been found in the strata proposed to be mined under the A-7 Plan. The Mowry Shale contains several primary bentonite beds that are commercially mined in this area including the “Mowry” and “Double” beds. The A-7 Plan proposes to mine bentonite from the “Mowry” bed. Depths/thicknesses of overburden within the A-7 area range outcrop to a maximum of 40’.

### **3.13 Socioeconomics and Environmental Justice**

The proposed operation is located in Washakie County, Wyoming. The closest town is Ten Sleep with a population of approximately 300. Communities in Washakie County include Ten Sleep and Worland. In 2005 the population of Washakie County was reported as 7,933 people. Washakie County covers 2,240 square miles and has a population density of 3.44 people per square mile.

Mining is an important sector of the local and regional economy. Data from the State of Wyoming Economic Analysis Division indicate that mining accounts for 5% of the jobs, and 6% of the personal income in Washakie County.

In 2006 in Washakie County, approximately 232 people were employed directly by the mining industry. Black Hills Bentonite (BHB) has approximately 18 full time employees and several summer part-time employees in Washakie County, the majority of which live in Worland or Ten Sleep, Wyoming. BHB also contracts with at least three Washakie County trucking companies to haul bentonite from their permitted mines near Ten Sleep to their

processing plant in Worland.

**3.14 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. No mining specific hazardous materials substances such as cyanide or other leaching agents would be used and no hazardous mining specific hazardous wastes will be generated in the bentonite mining operations under the A-7 Plan. No explosives will be used under this Plan.

## 4.0 ENVIRONMENTAL CONSEQUENCES

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

This Environmental Assessment (EA) analyzes the proposed disturbance on the public lands relative to the proposed action (6.3 acres), and analyzes the entire proposed disturbance as part of the cumulative effects analysis (18.5 acres). No detailed analysis was conducted for impacts outside of the proposed disturbance areas.

### 4.0.1 Critical Elements

<b>Table 4.1 Critical Elements</b>	<b>PROPOSED ACTION</b>	<b>PROPOSED ACTION WITH COA'S</b>	<b>NO ACTION</b>
Air Quality	<a href="#">See section 4.4.1</a>	<a href="#">See section 4.4.2</a>	<a href="#">See section 4.4.3</a>
Special Designated Areas; e.g., ACEC, natural area, etc.	Not present		
Cultural Resources	<a href="#">See section 4.11.1</a>	<a href="#">See section 4.11.2</a>	<a href="#">See section 4.11.3</a>
Paleontological Resources	<a href="#">See section 4.12.1</a>	<a href="#">See section 4.12.2</a>	<a href="#">See section 4.12.3</a>
Prime or Unique Farmlands	Not present		
Flood Plains	Not present		
Native American Religious Concerns	Not present		
Hazardous Wastes	<a href="#">See section 4.14.1</a>	<a href="#">See section 4.14.2</a>	<b>NOT AFFECTED</b>
Water Quality	<a href="#">See section 4.3.1</a>	<a href="#">See section 4.3.2</a>	<a href="#">See section 4.3.3</a>
Wetlands/Riparian Zones	<a href="#">See section 4.3.1</a>	<a href="#">See section 4.3.2</a>	<a href="#">See section 4.3.3</a>
Wild and Scenic Rivers	Not present		
Wilderness	Not present		
Environmental Justice	Not present		
Invasive, Non-Native Species (Weeds)	<a href="#">See section 4.6.1</a>	<a href="#">See section 4.6.2</a>	<a href="#">See Section 4.6.3</a>
Threatened or Endangered Species	None present		

### 4.1 Land Use

#### 4.1.1 Alternative 1 (Proposed Action)

Under the Proposed Action, existing land uses would remain the same as they are currently, with an increase in bentonite mining/reclamation, on 6.3 acres of public lands over a course of 10 years. Environmental consequences of this alternative on other existing land uses would be negligible.

#### 4.1.2 Alternative 2 (Proposed Action w/COAs)

Same as 4.1.1

Topsoil Stockpile 13-1 has been relocated SE of Overburden Stockpile 13-1 to avoid disturbance to an undisturbed area. The relocated area is on private lands, and has already been disturbed and reclaimed per WYDEQ standards.

#### 4.1.3 Alternative 3 (No Action)

Under this alternative, no new mining would occur on public lands within the project area, as the Plan of Operations would not be approved. Mining activity could continue in the A-7 plan area on private lands.

### 4.2 Geology

#### 4.2.1 Alternative 1 (Proposed Action)

The mining of the layer of bentonite from each of the pit areas would cause irretrievable loss of that locatable

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

#### **4.2.2 Alternative 2 (Proposed Action with COA's)**

Same as 4.2.1.

#### **4.2.3 Alternative 3 (No Action)**

The locatable mineral estate would be preserved on public lands if mining under a plan of operation is denied. Other approved mining operations in the area would continue and the claimant-operator would have an opportunity to apply to mine bentonite in other areas within Washakie County or otherwise within the Bighorn Basin where bentonite outcrops. Mining operations could continue on the private lands within the A-7 project area.

### **4.3 Hydrology**

#### **4.3.1 Alternative 1 (Proposed Action)**

The report (Intermountain Resources, 2005) conclusion provides the wetlands and other waters of the United States delineation for the Black Hills Bentonite Permit 281C North Ten Sleep Amendment No. 7 area. The amendment area does not contain jurisdictional wetlands or jurisdictional ephemeral stream channel Other Waters of the United States. Non-jurisdictional wetlands were not identified on this study area. However after BLM field visits to the site during the month of November 2009, there supports evidence of flowing water in the channel along with pooled water and other riparian vegetation within the floodplain of the unnamed tributary.

The area would likely see increased amounts of surface runoff following storm events due to the creation of new surface disturbance and compaction from additional haul roads. There will be additional erosion from installation of culverts and scour pools that have formed below culverts and crossings will continue to degrade and increase additional sediment into the stream. There will be probable minor changes in channel geomorphology around disturbed areas from the result of additional disturbance.

#### **4.3.2 Alternative 2 (Proposed Action with COA's)**

The routing of surface water by berms, straw bales or other devices as approved by the BLM and outlined in the amendment plan, around active stockpiles and exposed pits would be required to minimize potential increased runoff impacts.

Notification and Authorization of changes to low water crossings and or culverts to the BLM should be made known before work is completed.

#### **4.3.3 Alternative 3 (No Action)**

Mining on public lands within the A-7 project area would not be permitted. However, actions on adjacent private lands would be able to continue, runoff and erosion from these actions could impact adjacent public lands.

### **4.4 Air Quality**

#### **4.4.1 Alternative 1 (Proposed Action)**

Soil and overburden stripping, bentonite mining and hauling will result in an increase in the amount of particulate matter, fugitive dust, and fossil fuel combustion-related air pollution entering the air in the local area.

#### **4.4.2 Alternative 2 (Proposed Action with COA's)**

Under Alternative 2, the same impacts to air quality would occur as in the Proposed Action, and the same mitigation measures relative to dust suppression would apply.

#### **4.4.3 Alternative 3 (No Action)**

Under this alternative, public lands would remain in their current, undisturbed condition. No additional bentonite mining would occur as described in the proposed Plan, and no additional impacts to local air quality would take place on public lands.

#### **4.5 Soils**

##### **4.5.1 Alternative 1 (Proposed Action)**

Impacts to the soil resource and off-site impacts from runoff and erosion are likely to occur during the time that the soil is bare. These impacts could be reduced during interim reclamation. Successful reclamation could return to background levels within 5 years following reclamation.

Based on WEPP predictions soil erosion could average 6.7 tons/acre/year during the time that the soil is bare. In the unlikely event of a 50-year storm event, soil erosion could approach 53 tons/acre/year. During interim reclamation, average soil erosion is predicted to be reduced to 3 tons/acre/year. A 50-year storm event during this interim period could cause up to 30 tons/acre/year of soil loss; again this is an extremely unlikely event.

##### **4.5.2 Alternative 2 (Proposed Action with COA's)**

Given full implementation of BMPs and successful reclamation runoff and erosion rates in mined areas could return to background levels within 5 years following reclamation.

##### **4.5.3 Alternative 3 (No Action)**

Under this alternative, no soil impacts are anticipated on public lands. Mining could continue within the A-7 project area on private lands, runoff and erosion from these actions could impact adjacent public lands.

#### **4.6 Vegetation / Invasive plant species**

The Proposed Action would result in disturbance to the native soil profile in the A-7 mining areas, as well as loss of established native vegetation on approximately 6.3 acres of public land, and the associated wildlife forage/livestock grazing forage. It could also result in an increase in weeds/noxious and invasive Plant species in the area of the proposed mine.

##### **4.6.1 Alternative 1 (Proposed Action)**

Impacts of the Proposed Action to soils, vegetation, forage and livestock grazing would require mitigation (by both BLM and LQD), as per the terms of any approved mining and reclamation plan(s) and as presented in the A-7 application, and any accompanying mitigation measures. Topsoil and subsoil would be stripped, stockpiled and salvaged prior to removal of overburden and bentonite, using the specific soil handling procedures described in the A-7 Mine Plan. An overburden thickness ranging from 5-30 feet would need to be removed to expose the bentonite in various portions of the A-7 Plan area. Mining operations will require additional soil and overburden stockpiling areas, and associated disturbance areas. However, associated disturbance relative to proposed mining would be required to be kept to a minimum, to prevent unnecessary and undue disturbance of and to native soil profiles and vegetation. Reclamation of a final pit in a sequence will take this into account, and disturb the least amount of native acreage necessary during reclamation. Out-of-pit spoil piles would be properly sited, stabilized and reclaimed so as to blend in with existing topography post mine.

Topsoil replacement would take place to proper depths to allow re-establishment of vegetation. Replaced topsoil will be left in a roughened state to increase micro-topography, and enhance moisture harvesting capacity of the soil. Compacted areas such as haul or spur roads, will be deep-ripped during reclamation, prior to seeding. Areas that were barren of topsoil pre-mine may be left barren of topsoil post mine with prior approval of the WDEQ-LQD.

Prior to the re-establishment of vegetation, mined areas would provide very limited amounts of vegetation to support livestock grazing or wildlife. Mitigation measures would include use of proper seed mixtures and seeding application rates, to help reestablish vegetation over time, to pre-mine or better conditions. All commercial seed used during reclamation of the public lands will be certified noxious weed-free by laboratory testing, and any hay or straw used for check-dam construction or mulching will be certified weed-free. Some reclaimed areas may need to be fenced to exclude livestock from grazing too heavily on new-germinated or established seedlings in these areas.

After topsoil spreading, seed mixture(s) would be applied utilizing a conventional seed drill or a no-till drill. In areas where soil compaction is significant, seeding would be preceded by ripping with appropriate reclamation equipment. Ripping and seeding operations will be done along contour or perpendicular to the prevailing winds whenever possible.

Seeding would generally be conducted between October 1<sup>st</sup> and November 1<sup>st</sup> of the year following topsoil replacement. BHB may attempt spring seeding with a temporary seed mixture on areas where live topsoil has been directly placed during the winter months prior to what would be the fall seeding period.

The proposed action incorporates the mining of approximately 3.0 acres of bentonite on public lands within the A-7 project area. An additional 3.3 acres of disturbance on public lands are proposed for support actions to mining; including bentonite storage areas, and topsoil areas.

Based on historical reclamation success in the area, vegetation would take approximately 1-2 years to re-establish.

Noxious and invasive weeds can occur both directly and indirectly from development activities that cause disturbance. Weeds and weed seed can be transported and spread with road surfacing and other construction related events including reclamation activities. Weeds and weed seed can be attached to equipment and vehicles thus having the potential to be spread over large areas. Physical disturbance of the soil, as well as soil moisture and chemical alterations from produced water discharge, and stream flow / storage will also create opportunities for the introduction, infestation and spread of noxious and invasive weeds.

An increase in mining-related disturbance could cause an increase in establishment of noxious and undesirable weed species. If noxious weeds are noted during mining or reclamation, BHB would be responsible for treatment and removal of such weeds, with the assistance of Washakie County Weed and Pest District. Where noxious weed infestations are noted on Federal lands associated with this amendment, all off-road access would be limited to only necessary routes and will be controlled to minimize travel in the infested area until weed removal is accomplished.

#### **4.6.2 Alternative 2 (Proposed Action with COA's)**

Addition of mitigation measures for treatment of invasive species would reduce the impact of surface disturbing activities associated with the proposed action. BHB would be required to submit a Weed Management Plan, in accordance with Wyoming Reclamation Policy (March 2009), prior to commencing surface disturbing activities on public lands.

#### **4.6.3 Alternative 3 (No Action)**

Under this alternative, no surface disturbing actions would be permitted on public lands within the proposed project area. Mining on the private lands within the A-7 project area would be able to continue under the permit of the DEQ, invasive species could develop from these actions; which in turn could impact adjacent public lands.

### **4.7 Livestock Grazing**

#### **4.7.1 Alternative 1 (Proposed Action)**

Vegetation in the proposed bentonite mining area is very sparse, and does not contribute significantly to the overall livestock forage in the allotment. The proposed project should not have a significant effect on livestock grazing in the allotment.

#### **4.7.2 Alternative 2 (Proposed Action with COA's)**

Same as 4.7.1

#### **4.7.3 Alternative 3 (No Action)**

No resulting effects on livestock grazing would be expected to occur beyond the current situation.

#### **4.8 Wildlife**

##### **4.8.1 Alternative 1 (Proposed Action)**

About 6.3 total acres of native wildlife habitat on public lands would be temporarily lost for 1-2 years as a result of the A-7 mining operation, depending on success of reclamation and establishment of native vegetation. Wildlife habitat on the proposed A-7 area is fairly limited and not widely used, as vegetation is generally sparse, with the exception of ephemeral draws and swales. Pronghorn and mule deer are occasionally seen in this area, indicating the presence of suitable habitat for these species.

No sage grouse leks are located in, or within one mile of the project area, though sage grouse have been observed in the A-7 area. Therefore, a reasonable conclusion is that sage grouse do use available habitat in the A-7 area. Mule deer, pronghorn, coyote, and small mammals would be temporarily displaced by mining activities, and would most likely move to other areas of suitable habitat on adjacent lands surrounding the mining areas. Therefore, non-T&E wildlife populations may be displaced but should not be detrimentally affected by the Proposed Action.

Mining activities would not directly affect important riparian wildlife habitat, as no wetlands or riparian areas occur in the A-7 areas.

Raptor nesting sites adjacent to the A-7 area would be regularly monitored; BLM and USFWS would require BHB to conduct an annual survey for raptor nests prior to any surface disturbing activities, to ensure no raptor nests would be disturbed. Prompt notification to BLM would be required if raptor nesting sites were discovered before or during the course of mining in the A-7 area. Appropriate mitigation would then be determined.

BLM may also require additional types of wildlife monitoring during the course of mining, to ensure that species of concern in the area if any, are recorded and afforded protection where possible or feasible.

##### **4.8.2 Alternative 2 (Proposed Action with COA's)**

No additional consequences would be expected under this alternative beyond those discussed in 4.8.1.

BLM would require notification by BHB if any nest sites are discovered during mining activities, and then appropriate mitigation would be determined.

The northern proposed BLM mining disturbance is within approximately 1/2 mile of an active red-tailed hawk nest, and the proposed mining activity could potentially disturb and/or cause abandonment of nesting activity if allowed to continue during the nesting season. For this reason the TLS for nesting raptors is recommended for the northern most portion of the proposed disturbance.

According to the wildlife report provided by Black Hills Bentonite, an active sage-grouse lek was identified about 1.5 miles southwest of the proposed mining activity and another 3 known active leks are located approximately 4 to 5 miles south. And the two southern most BLM portions proposed for mining, currently could provide sage-grouse nesting habitat, and are within the Sage-grouse Core Areas. Because of our current RMP guidance on managing for sage-grouse nesting habitat within 2 miles from active leks, and more current Wyoming research and Core Area management recommendations, demonstrating that most hens nest within 4 to 6 miles from active leks, we also recommend the application of the TLS for nesting and early brood rearing sage-grouse.

##### **4.8.3 Alternative 3 (No Action)**

Under this alternative, approximately 6.3 acres of disturbance to public lands would not occur, allowing that available forage for wildlife. However, mining activities could continue on adjacent private lands.

#### **4.9 Threatened, Endangered, Candidate, and BLM Sensitive Species**

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

###### **4.9.1.1 Alternative 1 (Proposed Action)**

No Threatened, Endangered, Candidate or BLM Sensitive plant species were identified within the proposed surface disturbances or project area.

###### **4.9.1.2 Alternative 2 (Proposed Action with COA's)**

Same as 4.9.1.1

**4.9.1.3 Alternative 3 (No Action)**

No effect.

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

**4.9.2.1 Alternative 1 (Proposed Action)**

Bald eagles, formerly listed as Threatened, are known to occur in the A-7 general area and migrate through the A-7 area. According to various references, Bald eagles will tolerate some human activity in areas of high prey availability. Winter habitat suitability is defined by food availability, presence of roost sites that provide protection from inclement weather, and absence of human disturbance

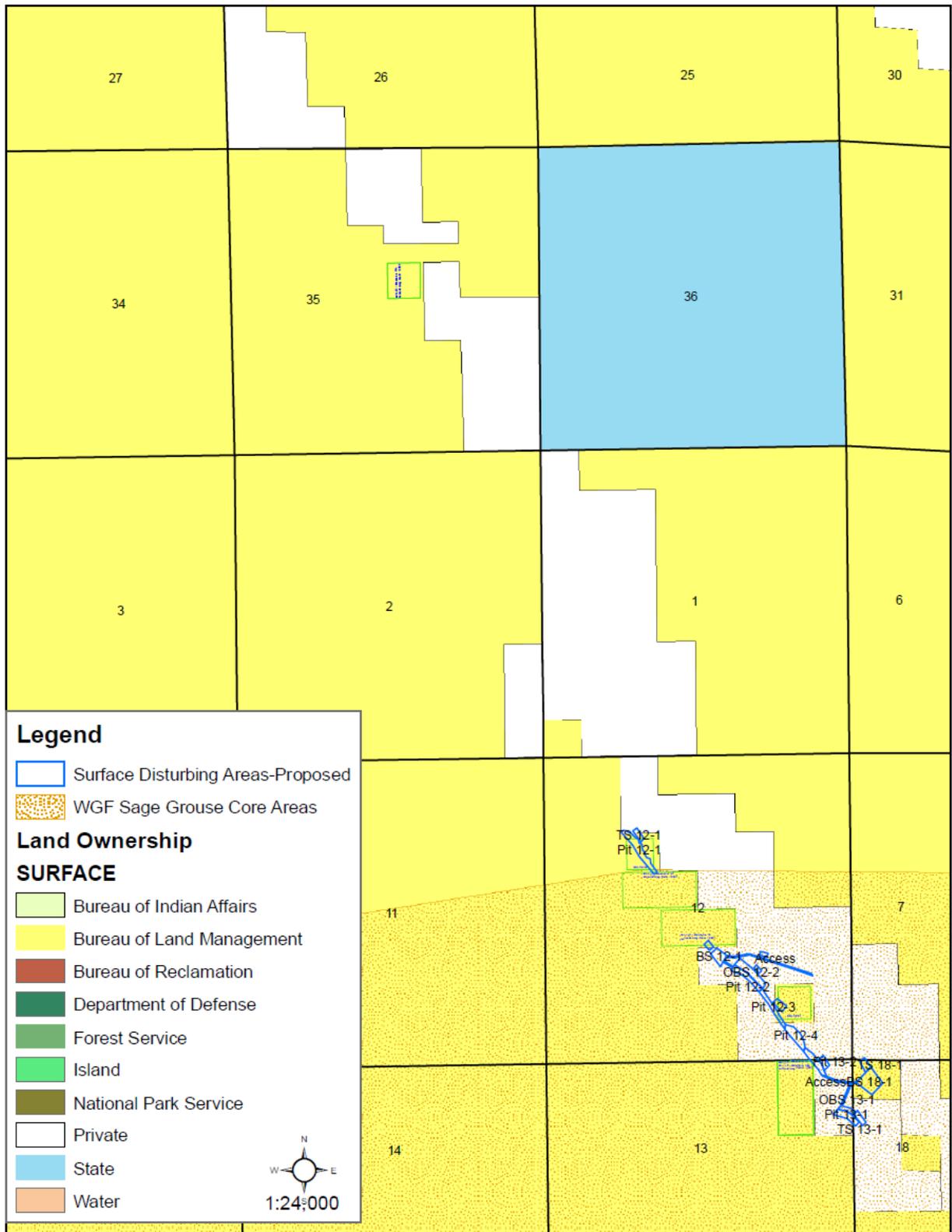
([http://bna.birds.cornell.edu/BNA/BHBount/Bald\\_Eagle/HABITAT.html](http://bna.birds.cornell.edu/BNA/BHBount/Bald_Eagle/HABITAT.html)).

**4.9.2.2 Alternative 2 (Proposed Action with COA's)**

Same as 4.9.2.1

**4.9.2.3 Alternative 3 (No Action)**

No effect.



#### **4.10 Recreation and Visual Resources**

##### **4.10.1 Alternative 1 (Proposed Action)**

Visual resources in the Class IV VRM management area would not be affected if the Proposed Action is approved, as new mining under the A-7 Plan would be consistent with past and current mining activities in the area, and consistent with management criteria for a Class IV VRM designation. The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Recreational opportunities within the project area are somewhat restricted or limited due to the current bentonite mining. Such industrial settings located in a wild land setting will interfere with the recreationists' goals and result in unrealized outcomes. This non-benefit will displace users to alternative areas, which those alternative wild land areas may not be sufficient to achieve realized outcomes. The bentonite activities may introduce or cumulate additional user conflicts and hazards to those recreating in the area.

##### **4.10.2 Alternative 2 (Proposed Action with COA's)**

Although this alternative would benefit the recreational setting character conditions more so than Alternative 1, impacts to recreation management would be the same as Alternative 1.

Visual resources in the Class IV VRM management area would not be affected if this alternative was selected; as new mining in this area is consistent with past and current mining activities that have taken place in the area.

Effects on visual resources from mining would be mitigated through adherence of the reclamation plan.

##### **4.10.3 Alternative 3 (No Action)**

Under the No Action Alternative, the development of the Proposed Action would not occur on public lands, however, mining operations could continue on private lands within the A-7 project area. No resulting effects on recreation or visual resources would be expected to occur beyond the current situation.

#### **4.11 Cultural and Historical Resources**

##### **4.11.1 Alternative 1 (Proposed Action)**

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

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

##### **4.11.2 Alternative 2 (Proposed Action with COA's)**

Same as 4.11.1

##### **4.11.3 Alternative 3 (No Action)**

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

#### **4.12 Paleontology**

##### **4.12.1 Alternative 1 (Proposed Action)**

Because no significant vertebrate paleontological resources are known from this area, this resource would not be impacted as a result of the Proposed Action. If vertebrate fossils were discovered during mining operations including overburden stripping, mining would have to stop temporarily at the location, and the BLM Authorized Office would have to be notified immediately by BHB, so the fossil resources could be properly investigated and assessed. Significant scientifically valuable fossil resources would be removed from the area prior to resumption of mining.

#### **4.12.2 Alternative 2 (Proposed Action with COA's)**

Same as 4.12.1

#### **4.12.3 Alternative 3 (No Action)**

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

### **4.13 Socioeconomic**

#### **4.13.1 Alternative 1 (Proposed Action)**

Approval of the Proposed Action would benefit BHB by providing the company with a long-term mine that provides high quality, in-demand clay. It would also assist in keeping the local mining-related economy at its current level, and allow for a steady flow of bentonite to be hauled to BHB mill in Worland during the life of the A-7 mine. No significant increase in the number of mine personnel or service contractors is anticipated as a result of this approval of this Plan of Operations.

#### **4.13.2 Alternative 2 (Proposed Action with COA's)**

Same as 4.13.1

#### **4.13.3 Alternative 3 (No Action)**

The proposed action incorporates the mining of approximately 3.0 acres of bentonite on public lands within the A-7 project area. An additional 3.3 acres of disturbance on public lands are proposed for support actions to mining; including bentonite storage areas, and topsoil areas. The denial of the proposed action would have negligible to no influence on the economy of BHB, Washakie County, the Big Horn Basin, or Wyoming. Mining on the private lands within the A-7 project area would be able to continue under the permit of the DEQ.

### **4.14 Hazardous Materials; Public Health and Safety**

#### **4.14.1 Alternative 1 (Proposed Action)**

BHB does not intend to use blasting as part of the A-7 operations.

As with most industrial mining operations, there would be limited leaks of oil and/or hydraulic fluid from heavy equipment and vehicles on site. BHB has addressed spill prevention and management under the Wyoming DEQ Storm Water Pollution Prevention Plan for Permit 281C, to address such leaks, or any spills of hydrocarbons on the mine sites.

#### **4.14.2 Alternative 2 (Proposed Action with COA's)**

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

As a COA accidental releases would be adequately remediated and reported to the Authorized Officer; when the operator contacts the BLM regarding such a release, information about where the spilled fluid and the contaminated ground would be disposed of or treated would be disclosed by the operator.

#### **4.14.3 Alternative 3 (No Action)**

Under the No Action Alternative, the development of the proposed action would not occur on public lands. Mining activity could continue on private lands within the A-7 project area. Any release of hazardous materials on private lands could impact adjacent public lands.

### **4.15 Residual Impacts of the Proposed Action**

**Air Quality** – There would be some temporary deterioration to air quality in the vicinity of the proposed A-7 mine areas due to stripping, mining and hauling activities during the life of the mines, as well as after reclamation of vegetation has been deemed complete. This residual impact would be in the form of a localized increase in particulate matter (dust) and fossil fuel combustion-related constituents available for transport by wind due to the proposed activities, and due to an initial lack of vegetative cover after reclamation is completed.

**Cultural Resources**--The Proposed Action would not result in any unavoidable residual impacts to cultural

resources, unless such resources were located during mining or spur road construction and *not* reported to the BLM authorized officer. The cultural resource stipulations should mitigate this residual impact.

**Vegetation --** The Proposed Action would result in the initial disturbance of approximately 6.3 acres of native vegetation and rock outcrops on public lands. The proposed entire mine area could take 1-2 years after reclamation is initiated to achieve vegetative production and species diversity comparable to pre-mine conditions. Some sagebrush habitat may be difficult to re-establish for up to 10-20 years post-mine operations. This sagebrush habitat could be replaced by saltbush or other desert shrub habitat over time.

**Water Quality--** There would be minor surface disturbance within the affected watershed(s) on the proposed mine area. Water that would normally flow to the unnamed tributaries of the Big Cottonwood Creek drainage would be directed towards sump pits and bermed areas within the mine, resulting in a loss of some water to these drainages until they were reestablished. This water would be very minor in volume, and while held in sump pits and bermed areas, may provide a temporary watering site for area wildlife.

**Wildlife --** The Proposed Action would result in the temporary loss over the life of the mine, of approximately 6.3 acres of native wildlife habitat on public lands. It may take 1-2 years or more for this habitat to be reestablished to pre-mine conditions, and significantly longer for the sagebrush component of the habitat to reestablish. Once bentonite mining is completed in the A-7 area, residual impacts should be minimal if reclamation practices are successful. Mitigation measures would reduce the negative visual effects by requiring the disturbed areas to be reclaimed and revegetated, to blend into the surrounding topography.

**Recreation/VRM**

The mining pits will further alter the recreational setting character conditions to a more rural/industrial setting. After reclamation, these impacts will be more subtle, but the recreational resources (landscape, settings, experiences, and benefits) will remain altered. The mining pits will introduce contrasting elements of form, line, color, and texture against the surrounding environment during excavation. After reclamation, these contrasts will be more subordinate and may be unnoticeable to the casual observer. However, changes to these basic elements will remain.

**4.16 Cumulative Impacts**

The Worland Field Office conducted a general CEA for the Proposed Action under this EA, using GIS overlays and field inspections. Bentonite mining has taken place within the boundaries of the cumulative effects analysis area (CEA) for approximately 33 years. The A-7 area consists of approximately 150 acres. Mine permit boundaries are established for administrative purposes and are polygonal areas bounding the general area of interest to the mining company. Not all lands within the DEQ designated mine 281C A-7 permit boundary would be disturbed by bentonite mining due to the topography of the area, as well as the dip angle of the sedimentary formations, quality, and thickness the individual bentonite beds that occur in these areas.

The area analyzed for the CEA is north of Highway 16 and adjacent to the proposed A-7 action, as illustrated in Map MP-1 (submitted in Mine Plan). The original 281C mine permit was authorized in 1975. The following past and present disturbances have occurred in the 281C mining area and associated amendments within the CEA:

<b>Table 4.2 Past, Present &amp; Future Actions</b>		
Action	Public (Acres)	Private (Acres)
Total Disturbed in CEA area	337	979
Total Seeded	261	777
Total Seeded & Released from bond	213	417
Total Seeded & waiting for vegetation to establish	48	360
Total presently being mined	76	202
Total proposed for future mining	6.3	12.2

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

**Invasive plant species** - As a result of mining, approximately 18.4 acres of native vegetation would be removed directly from mine and stockpile areas, and from associated disturbance areas, over the life of the A-7 mining

operations. Bentonite mining around the areas of the proposed action will continue, increasing disturbance to vegetation and, without any form of treatments, the spread of cheatgrass. Competition with native plant species for water and nitrogen would continue to increase, as would fire frequency. If cheatgrass were to establish, few to no native grasses, forbs, and sagebrush would establish in the area.

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

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

**Soils** -- Implementation of the Proposed Action would result in some increased and unavoidable soil loss through wind and water erosion during and after mining. Productivity of some disturbed soils would be reduced due to removal of vegetation, mixing of soil horizons during mining, and erosion. Topsoil and subsoil removed from mine areas would lose some of its organic matter, and thus, some of its value in reclamation.

The soil profiles would be permanently changed following mining and reclamation, resulting in changes in infiltration rates and water holding capacity.

**Vegetation** -- Some vegetation could be lost forever due to climatic conditions, loss of soil productivity and other factors. Some areas that were barren pre-mine, may be reclaimed and vegetated post-mine.

**Socioeconomics** –There are no socio-economic forecasts for the Bighorn Basin within the Analysis of the Management Situation summary for the Bighorn Basin Resource Management Plan revision. However, the continuation of bentonite mining operations into the reasonably foreseeable future may result in a beneficial impact to the Washakie County area that is not quantifiable.

**Geology** -- Removal of the bentonite resource under the Proposed Action would constitute unavoidable and irretrievable commitments of bentonite resources.

**Recreation and Visual Resource Management**–Continual mining development would impact the scenic qualities of the area. The accumulation of (bentonite) mining in these wild land areas will alter the back and middle country settings to a more rural setting, which will interfere with desired outcomes. Access to the BLM surface would be restricted during mining operations for public safety reasons, and may be restricted post-reclamation to certain activities only. These additional non-benefits may impact some of the local tourism opportunities and result in visitors or tour-related businesses to realize beneficial outcomes in alternative places.

Implementation of the Proposed Action or Alternative 2 would result in impacts to the existing landscape and viewshed that are unavoidable. Reclamation efforts might never fully restore the mine site to its pre-mining condition. Road and mine activities, especially introduction of new out-of-pit spoil piles, could introduce permanent changes in color and line due to the exposure of underlying bedrock, removal of overburden, and disruption of natural contours.

## 5.0 Consultation and Coordination

### 5.1 List of Preparers

Name	Title
Mike Bies	Archaeologist
Jared Dalebout	Hydrologist
Marilyn Wegweiser	Geologist
Ted Igleheart/Tim Stephens	Wildlife Biologist
Paul Rau	Recreation Specialist
Cam Henrichsen	Range Management Specialist
Monica Goepferd	Civil Engineer
Carol Sheaff	Realty Specialist
Karen Hepp	T & E Plant Specialist / Range Management Specialist
Steve Kiracofe	Soil Scientist / Hazmat Coordinator
Rance Neighbors	Noxious Weeds Coordinator

### 5.2 Persons/Agencies Consulted

Land Quality Division, Wyoming Dept. of Environmental Quality, Lander District Office  
 Wyoming State Office, Bureau of Land Management  
 Wyoming Game and Fish Department  
 State Historic Preservation Office  
 US Fish & Wildlife Services, Cheyenne Wyoming  
 Washakie County Commissioners, Worland, WY  
 Barbara Chase; Black Hills Bentonite

## 6.0 References

- Black Hills Bentonite, L.L.C. Plan of Operations for Permit to Mine No. 281C –Amendment Area No. 7, 2009.
- Slaughter, M., and Early, J.W., 1965, Mineralogy and Geological Significance of the Mowry Bentonites, Wyoming. Special GSA Papers Number 83, New York, NY, 116 pp.
- BLM, 2009, Summary of the Analysis of the Management Situation for the Bighorn Basin Resource Management Plan Revision project; Cody and Worland Field Offices, Wyoming, pp. 2-1 – 2-9.
- U.S. Census Bureau, 2009, Washakie County QuickFacts; <http://quickfacts.census.gov/qfd/states/56/56043.html>, Washington, DC
- Buehler, David A. 2000. Bald Eagle (*Haliaeetus leucocephalus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America; [http://bna.birds.cornell.edu/BNA/BHBount/Bald\\_Eagle/HABITAT.html](http://bna.birds.cornell.edu/BNA/BHBount/Bald_Eagle/HABITAT.html)

## **Stipulations, Mitigation and Monitoring Measures**

The following stipulations, mitigation and monitoring measures would be placed on any BLM approval of Black Hills Bentonite's Permit to Mine No. 281C "Amendment-7" Plan of Operations under 43 CFR 3809:

### **Cultural and Paleontological Stipulations**

Cultural and Paleontological Standard Stipulations (compatible with the current 43 CFR 3809 regulations).

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

The operator/holder 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. If archaeological, historical, Native American or scientifically important paleontological remains are discovered, the operator/holder is to suspend all operations that further disturb such materials and immediately contact the Authorized Officer. Any such discovery shall be left intact until the operator/holder is told to proceed by the Authorized Officer.

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

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

### **Native American Resources**

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

### **Human Remains**

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

### **Threatened & Endangered Species Stipulations**

No specific T&E stipulations - See monitoring and mitigation measures, below.

### **Mitigation Measures and Monitoring**

As described in 43 CFR 1508.20, "Mitigation" includes:

- (a) Avoiding the impact altogether by not taking a certain action or parts of an action.
- (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- (e) Compensating for the impact by replacing or providing substitute resources or environments.

The following items are mitigation measures and monitoring requirements that would be attached to any approval of the Proposed Action:

**Air Quality**

If it becomes necessary to control and suppress fugitive dust generated by haul trucks, all haul roads will be kept wet by using a water truck mounted with a spray bar.

**Reclamation and Seed Mix**

Prior to commencement of reclamation the authorized officer of the BLM would be notified.

Within 1-2 years following mining (removal) of bentonite, all disturbed pits, other associated disturbance areas, and associated haul roads not needed for current mining actions, would be recontoured to match surrounding topography and prevent erosion and all hydrologic drainages reestablished.

The seed mix BHB proposes to use has been previously approved by WDEQ/LQD for use on the permit area.

Reseeding of the disturbed areas will be conducted using the following seed mix(es) on the public lands as approved by WDEQ-LQD and BLM:

Common Name (Variety)	Pounds of pure live seed per acre
Bluebunch wheatgrass (Secar CT)	3.00
Indian ricegrass (Rimrock CT)	4.00
Russian wildrye (Bozoisky)	2.00
Bottlebrush squirreltail	2.00
Gardner saltbush	2.00
Fourwing saltbush	2.00
Wyoming big sagebrush	0.10
Rubber rabbitbrush	0.50
Total	15.60

Seed will be planted during October – November, as soon as possible after topsoiling. All seed would be certified weed free. No mulch or fertilizer would be applied, and no irrigation would be applied.

**Wildlife**

To protect raptor and/or sage and sharp-tailed grouse nesting habitat, surface disturbing activities will not be allowed during the period from February 1 to July 31 within lands that contain active nests or suitable nesting habitat, as determined by field surveys. Exceptions could be approved in writing, including documentation supporting analysis, by the authorized officer.

**Threatened & Endangered Species**

Prior to any surface disturbing activities under the A-7 Plan, on-the-ground surveys will be conducted for any species or candidate species that are Threatened or Endangered. On-the-ground surveys would be conducted prior to any surface disturbing activities to ensure no raptor nests would be disturbed by mining or road building. BLM shall be notified immediately if raptor nest sites are discovered prior to or during mining activities, and appropriate mitigation would then be determined. Monitoring will also be conducted throughout the life of the mine for raptors, T&E species, sage grouse and MBHFI. BLM shall be notified by BHB of the results of any wildlife monitoring upon request. Results of surveying or monitoring activities shall be provided annually or on request.

**Noxious or Invasive Weeds**

In compliance with Wyoming Reclamation Policy (BLM March 2009), Black Hills Bentonite shall submit a Weed Management Plan; with approval from the Washakie County Weed and Pest Control District and the BLM’s Noxious and Invasive Weed Coordinator, prior to commencing surface disturbing activities on public lands.

The operator (Black Hills Bentonite, L.L.C.) would be responsible for controlling all noxious and undesirable invading plant species in mined and/or reclaimed areas until the revegetation activities have been determined to be

successful, and the bond has been released for a given area. If noxious or invasive weeds are encountered, the Washakie County Weed and Pest shall be contacted by the operator/holder for control and eradication. Written approval from the Authorized Officer for the use of herbicides must be obtained prior to usage of herbicides.

#### **Fencing of Reclaimed Areas**

If it becomes necessary, BHB will construct fencing based upon agreement with respective surface owners including BLM, to protect newly seeded areas post-mine. Fences erected to protect newly reclaimed areas would be removed after release of the reclamation bond, if the surface owner requests it. Extended vegetation reference areas will be used in the A-7 Plan to assist in determining when or if bond release is acceptable to LQD and BLM.

#### **Roads**

Three short segments of new roads will be required. These roads will be built according to BHBs specifications as outlined in their application, as well as according to BLM Manual Section 9113. Culverts will be properly sized to allow through-flow of storm or runoff water based on WDEQ/LQD recommendations and as specified under BLM 9113.

Notification and Authorization of changes to low water crossings and or culverts should be made known to the BLM before work is completed.

#### **Visual Resources**

Reclamation will be conducted concurrent with mining as much as possible. Use of mine pit areas for bentonite drying shall be kept to a minimum so that mine pits can be backfilled, recontoured and reseeded in a timely manner. Mined areas shall be contoured to blend in with the adjacent surroundings and support similar vegetation. Unnecessary and undue degradation of native soils and vegetation will not be allowed to occur as a result of bentonite mining in the A-7 area. Final pits in a sequence shall be backfilled appropriately.

#### **Hazardous Materials**

As part of the notification process, the operator shall inform the BLM of spills of more than 25 gallons; a report shall be submitted to the Authorized Officer within 10 days of the release with detailed information regarding the contaminate and how the ground contaminated by such a spills would be disposed of or treated.