

**RECLAMATION PLAN**  
**for**  
**PERMIT TO MINE NO. 339C – NORTH FORK AMENDMENT AREA**  
**and the associated**  
**BUREAU OF LAND MANAGEMENT PLAN OF OPERATION**

**Table of Contents**

INTRODUCTION.....	1
1.0 POST MINING LAND USES .....	1
2.0 CONTOURING PLAN FOR AFFECTED LANDS .....	1
2.1 Surface Configuration and Post-Mining Land Uses .....	1
2.2 Blending Affected Lands with Adjacent Topography .....	1
2.3 Control of Erosion and Sedimentation.....	2
2.4 Re-Establishment of Drainages.....	2
2.5 Acceptable Slope Conditions.....	2
3.0 SURFACE PREPARATION FOR TOPSOIL REPLACEMENT .....	3
4.0 TOPSOIL REPLACEMENT AND HANDLING.....	3
4.1 Methods of Topsoil Replacement .....	3
4.2 Schedule for Topsoil Replacement .....	3
4.3 Special Soil Reconstruction Procedures and Special Treatments.....	3
4.4 Depth of Topsoil Replaced on Affected Lands.....	3
4.5 Soil Amendments.....	4
5.0 REVEGETATION PRACTICES.....	4
5.1 Topsoil Decompaction and Tillage.....	4
5.2 Cover Crops and/or Mulch.....	4
5.3 Permanent Seed Mixture.....	4
5.4 Temporary Seed Mixtures.....	5
5.5 Woody Species Transplants.....	5
5.6 Post-Mining Husbandry Practices.....	5
5.7 Protection of Seeded Areas.....	6
5.8 Control of Noxious Weeds.....	6
6.0 RECLAMATION SUCCESS CRITERIA AND METHODS FOR DETERMINING SUCCESSFUL RECLAMATION.....	6
6.1 Reclamation Success Criteria .....	6
6.2 Extended Reference Areas .....	7
6.3 Methods for Demonstrating and Evaluating Reclamation Success .....	7
7.0 FINAL HYDROLOGIC RESTORATION .....	8
8.0 RIPARIAN MITIGATION PLANS ( <i>BLM Required Information</i> ).....	8
9.0 ISOLATION AND CONTROL OF ACID-FORMING, DELETERIOUS MATERIALS, OR NON- EXEMPT RCRA MATERIALS ( <i>BLM Required Information</i> ).....	9
9.1 Spill Containment and Countermeasures ( <i>BLM Required Information</i> ) .....	9
9.2 Human Waste Management during the Reclamation Phase ( <i>BLM Required Information</i> )....	10

10.0	DECOMMISSIONING, STABILIZATION AND REMOVAL OF BUILDINGS, STRUCTURES AND SUPPORT FACILITIES .....	10
11.0	EXPLORATION DRILL HOLE PLUGGING ( <i>BLM Required Information</i> ).....	10
12.0	POST-CLOSURE MANAGEMENT ( <i>BLM Required Information</i> ) .....	11
13.0	RECLAMATION SCHEDULE.....	11
14.0	RECLAMATION COST ESTIMATES AND BONDING.....	11
14.1	Reclamation Cost Estimates & Production Rates .....	11
14.2	Contingency Costs .....	12
14.3	Reclamation Bond.....	12

**Tables**

Table RP-1	Permanent Seed Mixture .....	13
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**INTRODUCTION**

Black Hills Bentonite, LLC (BHB) has prepared this reclamation plan for the Permit to Mine No. 339C-North Fork Amendment Area (NFAA) in order to meet the mining permit amendment application requirements of the Wyoming Department of Environmental Quality-Land Quality Division (WDEQ/LQD). Additionally, this reclamation plan has also been written and prepared to meet the requirements set forth by the Bureau of Land Management (BLM) under 43 CFR 3809.401, commonly referred to as a Plan of Operation. It is the intent of BHB to provide one common reclamation plan which contains information required by both the WDEQ/LQD and the BLM. In review of this reclamation plan, certain information may be included which is not required by the WDEQ/LQD, and in other instances certain information is included which is not required by the BLM.

BHB is also submitting to the BLM Buffalo Field Office (BFO), as a Plan of Operation under 43 CFR 3809.401, an exact duplicate copy of the complete WDEQ/LQD-NFAA application.

**1.0 POST MINING LAND USES**

Lands affected by BHB's bentonite mining activities on the NFAA will be reclaimed to the pre-mining land use of livestock grazing.

**2.0 CONTOURING PLAN FOR AFFECTED LANDS**

**2.1 Surface Configuration and Post-Mining Land Uses**

After the bentonite is removed from a pit, and as the mining sequence progresses, the open pit is backfilled and contoured to blend in with the surrounding topography and to restore the area to the approximate original contour (AOC). Restoring the pre-mining topography to AOC will ensure that the reclaimed lands are compatible with the post-mining land use.

**2.2 Blending Affected Lands with Adjacent Topography**

Post mining slopes will be graded to 4H:1V or flatter, with a straight slope profile, unless the pre-mine slopes were steeper. In those cases, post-mining slopes will approximate the pre-mining slopes in terms of magnitude, aspect and shape. Generally, there is enough "swell" in the volume of overburden being replaced to compensate for the overall volume of the bentonite which was removed from the pit.

In general, most pits are completely backfilled and rough graded in order to establish AOC and the required slope angles utilizing Caterpillar 627G push-pull scrapers. In certain circumstances, both the Caterpillar 627G push-pull scrapers and the Caterpillar D8R/D8T dozers are utilized to backfill, grade and contour a pit in order to create the final surface configuration. At times, overburden may be placed in the pit and against the highwall utilizing the scrapers, to a point where the pit is not completely backfilled. This would create a partially backfilled pit with a section of the highwall remaining above the backfilled overburden. Caterpillar D8R/D8T dozers would then be used to push overburden from above and behind the remaining highwall, into the pit area, thus completing the backfilling of the pit. A schematic diagram of this backfill scenario is illustrated in Figure MP-3 of the Mine Plan.

### **2.3 Control of Erosion and Sedimentation**

During the reclamation phase, run-off from lands undergoing reclamation activities will be minimized and controlled in order to reduce or eliminate sediment-loading onto undisturbed lands. This can be achieved by diverting storm water flows generated by significant rainfall events or rapid snow melt away from and around disturbed areas associated with the reclamation activities. Diversion ditches may be constructed to divert water away from reclamation areas. Given the small size of the affected watersheds in the NFAA, diversion ditches may be constructed using the blade on a Caterpillar 140 motor grader or a Caterpillar D8R/D8T dozer. The diversion ditch will be cut to create a ditch which is triangular in shape and a minimum of 1.5 feet deep with 2:1 side slopes. Soil derived from the ditch cut will be "thrown" to the down slope side of the ditches, in essence creating a berm that will provide additional protection of the reclamation area. In the event that down-cutting or erosion should develop in the interceptor ditches or diversions, straw bales, straw logs, rock check dams or other erosion control features may be installed to control down-cutting of the ditch or channel bottom. As a part of reclamation, all interceptor ditches will be graded out and contoured to blend into the surrounding topography, topsoiled and seeded.

### **2.4 Re-Establishment of Drainages**

No perennial or intermittent streams will be disturbed by the mining activities. Only ephemeral channels which infrequently carry water in direct response to a significant rainfall event or the rapid melting of a significant accumulation of snow will be affected by mining activities. These channels will be re-established during the reclamation phase. Reconstruction of the drainages will be accomplished using Caterpillar 627G push-pull scrapers and/or Caterpillar 140 motor graders to construct flat-bottomed swales that meander as much as possible and are at least as long as the native channels.

### **2.5 Acceptable Slope Conditions**

Post mining slopes will be graded to 4H:1V or flatter, with a straight slope profile, unless the pre-mine slopes were steeper. In those cases, post-mining slopes will approximate the pre-mining slopes in terms of magnitude, aspect and shape.

Out-of-pit overburden stockpiles will not remain as final reclamation features. All overburden will be backfilled into the final pit in the multiple cut, direct backfill sequence in order to ensure that post-mining slopes will approximate the pre-mining slopes in terms of magnitude, aspect and shape.

### **3.0 SURFACE PREPARATION FOR TOPSOIL REPLACEMENT**

Backfilled overburden will be graded and smoothed prior to applying topsoil in order to facilitate a uniform application of topsoil. Areas where backfilled overburden is compacted due to repeated traffic by scrapers or other equipment will be ripped using the rear scarifier on a Caterpillar 140 motor grader, or with a D8T/D8R dozer equipped with three ripper shanks.

### **4.0 TOPSOIL REPLACEMENT AND HANDLING**

#### **4.1 Methods of Topsoil Replacement**

Topsoil will be applied primarily with Caterpillar 627G push-pull scrapers. In areas which are too steep to safely operate scrapers, Caterpillar D8R/D8T bulldozers may be used to spread topsoil. Topsoil will be re-applied to approximately the original depth which existed on each area prior to removal.

#### **4.2 Schedule for Topsoil Replacement**

Topsoil will be applied to the affected areas as soon as possible, although the replacement schedule for topsoil application is dependent upon the mining and backfilling schedule. If areas are available for the direct application of topsoil, topsoil will be applied during the topsoil removal phase during the development of a new pit. Topsoil application from stockpiles is generally conducted during the late summer or early fall, immediately prior to the seeding phase.

#### **4.3 Special Soil Reconstruction Procedures and Special Treatments**

No special soil reconstruction techniques or procedures will be required or used on the NFAA. Additionally, no special treatment of topsoil will be conducted.

#### **4.4 Depth of Topsoil Replaced on Affected Lands**

Topsoil will be re-applied to approximately the original depth which was removed (see *Appendix D7, Soils*). In certain circumstances, such as the occurrence of isolated pockets of topsoil on bentonite outcrop areas, the topsoil will be applied to those areas where it will be most beneficial in terms of reclamation success. BHB will use its discretion in determining which areas are best suited for topsoil application in these special situations.

Refer to *Appendix D-7, Soils* for recommended topsoil salvage depths and locations of areas where no topsoil is available for salvage due to bentonite outcrops or other limiting factors such as chemical or physical properties.

#### **4.5 Soil Amendments**

No soil amendments will be used on the NFAA.

### **5.0 REVEGETATION PRACTICES**

#### **5.1 Topsoil Decompaction and Tillage**

In order to reduce the compaction of the topsoil created by passing over it with loaded Caterpillar 627G push-pull scrapers during the topsoil application process, proper tillage of the topsoil is a necessity. Due to the clay content in many of the soil types of the NFAA, as reported in *Appendix D7, Soils*, rubber-tired scrapers can exacerbate soil compaction. This generally results in soil conditions that are detrimental to seedling establishment unless topsoil tillage is conducted.

BHB will utilize a John Deere 7800 or 8000 series four-wheel drive tractor in conjunction with various tillage implements in order to decompact the topsoil and create a suitable seedbed prior to planting the cover crop and/or the permanent seed mixture. Depending on the degree of compaction and the physical characteristics of the soil, BHB may utilize a John Deere V-ripper in the initial phase of tillage, followed by disking with a heavy-duty Wishek disk. In other instances where the soil compaction is not so great, initial tillage may be conducted with a John Deere chisel plow, followed by disking with a heavy-duty Wishek disk. The depth of tillage is carefully controlled and monitored to prevent mixing of the topsoil with the underlying materials. Tillage will be conducted along the topographic contours whenever possible.

#### **5.2 Cover Crops and/or Mulch**

In the event that a fall seeding with the permanent seed mixture is not possible due to inclement weather, saturated or frozen soils, or other special circumstances, the area will be seeded with a sterile annual small grain hybrid such as triticale, as soon as possible, in order to protect the topsoil from erosion. The triticale cover crop will be drill seeded using a John Deere 7800 or 8000 series four-wheel drive tractor pulling either a Great Plains 1300 series grain drill with a six-inch row spacing, or a Great Plains NT1006 no-till grain drill with a seven-inch row spacing. The seed will be planted approximately one-half inch in depth, at a rate of fifty pounds per acre. After the cover crop has been established, the permanent seed mixture will be directly drill seeded into the standing stubble and biomass. No mulch such as straw or native hay will be applied in conjunction with the reclamation activities conducted on the NFAA.

#### **5.3 Permanent Seed Mixture**

Due to the predominance of cool season species in the permanent seed mixture, planting generally takes place during the months of October, November and December. Seeding is conducted using a John Deere 7800 or 8000 series four-wheel drive tractor pulling either a Great Plains 1300 series grain drill with a

six-inch row spacing, or a Great Plains NT1006 no-till grain drill with a seven-inch row spacing. The seed will be planted approximately one-quarter to one-half inch in depth. Both the Great Plains 1300 drill and the Great Plains NT1006 no-till grain drill are equipped with adjustable press-wheels located behind the disk-openers, which allows for careful control of the depth of planting. Seeding will be conducted along the topographic contours of the reclaimed area, or perpendicular to the prevailing winds whenever possible.

Due to the difficulties in feeding certain seeds such as sagebrush seed through a conventional grain drill, broadcast seeding may be conducted as well as drill seeding. Sagebrush will be broadcast seeded using a Herd mechanical broadcast seeder mounted on the three-point hitch of the John Deere 7800 or 8000 series tractor. The sagebrush seed may be applied immediately prior to seeding with the Great Plains 1300 or NT1006 drill, or the sagebrush seed may be applied on top of snow after the area has been drill seeded.

In the event that an area cannot be drill seeded due to steep topography or other special circumstances, hand broadcasting of seed may be attempted.

Species contained in the permanent seed mixture listed in Table RP-1 have been selected based on the following criteria:

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

#### **5.4 Temporary Seed Mixtures**

No temporary seed mixtures will be used on the NFAA.

#### **5.5 Woody Species Transplants**

Transplanting of woody species (trees) on the NFAA will not be conducted. No woody species exist on the pre-mining landscape of the NFAA.

#### **5.6 Post-Mining Husbandry Practices**

No post-mining husbandry practices will be conducted on the NFAA.

## **5.7 Protection of Seeded Areas**

At the discretion of BHB, and based on the grazing intensity occurring on the reclaimed areas, newly seeded areas may require fencing to protect these areas from grazing by livestock. If fencing is required to protect seeded areas on the NFAA, prior to construction, BHB will consult with the grazing lessee and the BLM in order to determine the locations and types of fences to be constructed.

## **5.8 Control of Noxious Weeds**

Per WDEQ/LQD Rules & Regulations, Chapter III, Section 2(d) (ix), in those areas where there were no or very few noxious weeds prior to being affected by mining, BHB will control and minimize the introduction of noxious weeds into the revegetated areas for a period of at least five years after the initial seeding. On BLM managed lands, a Pesticide Use Permit (PUP) will be obtained from the Authorized Officer prior to the use of herbicides.

## **6.0 RECLAMATION SUCCESS CRITERIA AND METHODS FOR DETERMINING SUCCESSFUL RECLAMATION**

### **6.1 Reclamation Success Criteria**

Reclamation will be determined successful, considered complete, and be eligible for full bond release under the following conditions specified by WDEQ/LQD Rules & Regulations, Chapter 3, Section 2, which states,

*"The Administrator shall not release the entire bond of any operator until such time as revegetation is completed, if revegetation is the method of reclamation as specified in the operator's approved reclamation plan. Revegetation shall be deemed to be complete when: (1) the vegetation species of the reclaimed land are self-renewing under natural conditions prevailing at the site; (2) the total vegetation cover of perennial species (excluding noxious weed species) and any species in the approved seed mix is at least equal to the total vegetation cover of perennial species (excluding noxious weed species) on the area before mining; (3) the species diversity and composition are suitable for the approved post-mining land use; and (4) the requirements in (1), (2) and (3) are achieved during one growing season, no earlier than the fifth full growing season on the reclaimed lands. The Administrator shall specify quantitative methods and procedures for determining whether equal total vegetation cover has been established and procedures for evaluating post-mining species diversity and composition."*

Additionally, on lands managed by the BLM, reclamation will meet the criteria set forth in the Wyoming BLM Reclamation Policy (BLM IM WY-2009-022).

Lands affected by mining and associated activities within the NFAA which have been classified as bentonite outcrop or shale outcrop in *Appendix D-8, Vegetation* will be reclaimed in such a manner that these lands will exhibit similar pre-mining characteristics. Similar pre-mining characteristics shall

include similar surface stability, approximate original contours, and an appearance similar to the pre-mining conditions.

Due to the absence of suitable plant growth material on lands classified as bentonite outcrop and shale outcrop, the establishment of vegetation will not be feasible. Therefore, these lands will be reclaimed by backfilling, grading, and contouring to produce a surface configuration which will be similar to the pre-mining conditions.

## **6.2 Extended Reference Areas**

BHB will use extended reference areas (ERA), as described by WDEQ/LQD Guideline No. 2, March 1986 for the purpose of evaluating post-mining reclamation success of affected lands on the NFAA area. The selection and verification of the representative nature of the ERA will be determined by evaluation of the vegetation mapping, pre-mining vegetation data, soils data, topographic and land use information. The location of the ERA will be mutually selected on-site by LQD and BHB personnel.

## **6.3 Methods for Demonstrating and Evaluating Reclamation Success**

Reclamation success will be evaluated by collecting quantitative data from the ERA and reclaimed area and directly comparing, by standard statistical procedure, the resulting data from each site. Data will be collected from an adequate sample size from each area. Adequate sample size will be determined using the information presented in WDEQ/LQD Guideline No. 2, Section IV - Estimating Adequate Sample Size, March, 1986.

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

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

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

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

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

## **7.0 FINAL HYDROLOGIC RESTORATION**

No perennial or intermittent streams will be disturbed by the mining activities. Only ephemeral channels which infrequently carry water in direct response to a significant rainfall event or the rapid melting of a significant accumulation of snow will be affected by mining activities. These channels will be re-established during the reclamation phase. Reconstruction of the drainages will be accomplished using Caterpillar 627G push-pull scrapers and/or Caterpillar 140 motor graders to construct flat-bottomed swales that meander as much as possible and are at least as long as the native channels.

All pits will be backfilled, with no depression and allowing for through-drainage. Post-mining slopes will approximate the pre-mining topography in terms of magnitude, aspect and slope. No impoundments are included as final reclamation features in the reclamation plan for the NFAA. As mining progresses, all secondary access roads and culverts that are no longer needed will be removed and the areas will be graded to achieve pre-mining contours.

## **8.0 RIPARIAN MITIGATION PLANS (*BLM Required Information*)**

*Appendix D10, Wetlands*, indicates that no perennial streams or riparian areas exist on the NFAA. Therefore, no riparian mitigation plans are required.

## **9.0 ISOLATION AND CONTROL OF ACID-FORMING, DELETERIOUS MATERIALS, OR NON-EXEMPT RCRA MATERIALS (*BLM Required Information*)**

Replacement of overburden during the course of backfilling open pits will be designed to create the most conducive reclamation substrate for revegetation as possible. Most often the most suitable overburden in terms of plant growth and desirable root zone material is found directly beneath the topsoil/subsoil strata, as demonstrated by the overburden sampling and laboratory analysis data presented in *Appendix D-5, Overburden, Table D5-1 - Overburden Analysis*.

Overburden suitability and rock characterizations, including the analytical protocols and criteria necessary to identify potential acidic and/or reactive conditions, or the generation of deleterious leachate were evaluated for the NFAA. Please refer to *Appendix D-5, Overburden*, for a complete and detailed assessment of the overburden suitability and rock characterizations. BHB has utilized the data presented in *Appendix D-5, Overburden*, in order to develop overburden handling and overburden replacement plans.

The laboratory analysis data for the overburden zones which were sampled on the NFAA indicated that the entire overburden strata contains suitable to marginal materials. Only two unsuitable values were reported, sodium absorption ratios (SAR) of 22.7 and 30.4, at an overburden depth of thirty-five to forty-five feet. Nearly the entire overburden strata exhibits marginal values for saturation percentage. Three marginal pH values ranging from 8.7 to 9.8 were reported in samples collected between thirty and forty-five feet. Texture was deemed marginal in a number of sample intervals. Based on these results, BHB believes that no special handling of overburden during pit excavation and backfilling is warranted, as a considerable amount of mixing of overburden occurs during the loading and unloading of the overburden using scrapers. This mixing effect should contribute to a blending of overburden materials, thus improving overall quality of the few zones or intervals of overburden exhibiting unsuitable SAR values.

Waste bentonite, which remains on the bentonite stockpile areas after the stockpiled bentonite has been removed for processing, will be disposed of by placing this material at the base of a highwall prior to backfilling. This is done to prevent this highly bentonitic material from being placed directly on the surface prior to the application of topsoil.

### **9.1 Spill Containment and Countermeasures (*BLM Required Information*)**

No staging areas, equipment maintenance and parking areas or equipment fueling areas will be developed or located on the NFAA. Therefore, there will be no storage of diesel fuel or lubricants on the NFAA. Additionally trash and other waste generated by the mining activities will be collected in custom made trash containers which are completely enclosed utilizing expanded metal. These containers will be located on a staging area outside the NFAA.

If a fuel spill were to occur on the NFAA as a result of a mechanical failure or damage to a piece of heavy equipment, mine personnel are instructed to make sure the site is safe, stop additional leakage or

spillage, ensure the containment of any spilled fuels or oils, and immediately contact the company's environmental compliance officer and/or mine manager.

Containment of a diesel fuel spill or a lubricating oil spill would most likely be contained utilizing the native earthen materials present at the site. Depending upon the size of the spill and the volume of contaminated earthen materials, the contaminated material would be removed with shovels or with the appropriate size of earth moving equipment. Disposal of the contaminated earthen material would be coordinated by BHB environmental personnel at an approved land farm in accordance with state and federal regulations.

In the event that the volume of a spill is greater than twenty-five gallons, BHB will report the spill to the Wyoming Department of Environmental Quality-Water Quality Division (WDEQ/WQD) and the BLM within twenty-four hours of the spill and a written report will be submitted to the WDEQ/WQD within seven days of the spill.

No materials or wastes considered non-exempt under the Resources Conservation and Recovery Act (RCRA) will be generated by or during the extraction of the bentonite. Therefore, plans for the isolation and control of non-exempt RCRA waste and materials are not provided.

## **9.2 Human Waste Management during the Reclamation Phase (BLM Required Information)**

Self-contained human waste collection receptacles (HWCR's) will be located on or adjacent to the NFAA area for use by BHB employees, contractors and visitors. The HWCR's will be serviced and maintained in an appropriate manner in order to provide a safe and healthy work area for mine site personnel. The use of HWCR's will also serve to reduce or eliminate un-necessary and undue impacts to the local environment.

## **10.0 DECOMMISSIONING, STABILIZATION AND REMOVAL OF BUILDINGS, STRUCTURES AND SUPPORT FACILITIES**

No buildings, processing plants, structures, staging areas, fueling stations, or other facilities will be constructed in conjunction with mining activities on the NFAA. The bentonite produced from the NFAA will be transported to existing bentonite processing plants located in Casper, Wyoming for processing, sale, and shipment to customers.

## **11.0 EXPLORATION DRILL HOLE PLUGGING (BLM Required Information)**

Exploration drilling consists of shallow auger drilling (< 50 feet) using a four-inch diameter auger drill mounted on a Ford F550 heavy duty four-wheel drive truck. Drill holes will be reclaimed by shoveling the auger cuttings back into the drill hole, completely filling the hole. The drill hole location will be marked with a two-inch by four-inch wooden stake placed in the hole. The area around the drill stake will be hand-seeded with certified weed-free native grass seed (Western wheatgrass) and lightly raked to

cover the seed with soil. Each drill hole will be reclaimed immediately and concurrently with the drilling program. No drill holes will remain open and/or un-plugged.

The drill hole plugging and sealing techniques described above meet all the plugging and sealing requirements of the WDEQ/LQD and the BLM.

## **12.0 POST-CLOSURE MANAGEMENT (*BLM Required Information*)**

BHB defines post-closure as the phase of the project immediately following the completion of reclamation activities, up to the time reclamation success is demonstrated and final bond release is approved by the LQD and BLM.

During this period, BHB will periodically monitor and evaluate the reclaimed areas for signs of erosion, off-site sedimentation, seeding failures and noxious weeds. Additionally, these sites will be monitored to ensure that they are not subject to overgrazing. If fences have been constructed to restrict grazing on the reclaimed areas, fences will be periodically examined in order to ensure their structural integrity. If the quality and integrity of the reclamation appears to be jeopardized by erosion, seeding failures, noxious weeds, etc., BHB will implement corrective actions to correct the problem at the first available opportunity.

## **13.0 RECLAMATION SCHEDULE**

Mining on the NFAA will be conducted in a multiple-cut, direct-backfill sequence. As the excavation of each pit progresses through the sequence, overburden removed from each advancing pit is directly placed (direct-backfill) in the previous open pit. Mining in this sequence allows for reclamation to begin concurrently with each new pit being developed in the advancing sequence. Section 3.7 and Section 6.3 of the Mine Plan provide additional information on the mining and reclamation sequence and schedule.

Reclamation of disturbed areas will begin as soon as possible, and all attempts will be made to assure that reclamation occurs concurrently with the mining activities. Due to the fact that field-drying of bentonite will occur on the NFAA, Chapter 13, Section 3(a) (vi), of the WDEQ/LQD Rules & Regulations requires that, *"The time schedule for reclamation shall require that reclamation begin within two years and be completed within four years of the date the land is affected, except where field drying is to take place, in which case reclamation must begin within three years and be completed within five years of the date the land is affected."*

## **14.0 RECLAMATION COST ESTIMATES AND BONDING**

### **14.1 Reclamation Cost Estimates & Production Rates**

BHB utilizes WDEQ/LQD Guideline 12 (2012) costs for overburden and topsoil replacement, as well as the Guideline 12 cost for final grading on the NFAA. Reclamation costs for tillage and seeding are

based on BHB costs using a John Deere 7810 series four-wheel drive tractor. These costs and production rates are presented below:

Cost of Overburden & Topsoil Replacement Using Caterpillar 637G Push-Pull Scrapers

\$1.067 per BCY assuming 500 foot distance, 0% grade, 4% rolling resistance

Cost of Final Grading Using a Caterpillar 16M Grader

\$73.79 per acre per Guideline 12.

Costs of Seeding with John Deere 7810 Tractor

\$439.76 per acre, including the cost of seed.

Seed costs are based on April 2012 seed prices provided by Granite Seed Company.

**14.2 Contingency Costs**

Total contingency costs for the amendment area is twenty-five percent based on the following factors:

Project Management	2%
Bid Preparation	2%
Site Maintenance	2%
Unknowns	3%
Mobilization	4%
Engineering	2%
Profit	10%

**14.3 Reclamation Bond**

Reclamation costs associated with each individual mining feature (pits, stockpiles, roads, etc.) on the NFAA are presented in Table MP-3 of the Mine Plan. Table MP-3 also lists the total reclamation cost for the entire operation based on the information presented above. Upon approval of this amendment application, BHB will provided LQD with a non-coal, self-bond general purpose rider in order to incorporate lands within the NFAA into Permit to Mine No. 339C. The general purposed rider will also provide an adequate reclamation bond amount commensurate with the reclamation costs associated with the first year of mining activities on the NFAA.

The total reclamation liability for Permit to Mine No. 339C is recalculated and updated on an annual basis. The updated reclamation liability will be presented in the LQD annual mining report for Permit to Mine No. 339C.

Table RP-1, Permanent Seed Mixture - Revised April 2012  
Permit to Mine No. 339C- North Fork Amendment Area  
BLM Plan of Operation WYW 168310

Species and Variety	Seeding Rate Pounds of Pure Live Seed per Acre
Western wheatgrass, Rosana	3.00
Bluebunch wheatgrass, P-7	2.00
Slender wheatgrass, Pryor	1.25
Thickspike wheatgrass, Bannock	1.50
Indian ricegrass, Nezpar	2.00
Alkali sacaton	0.50
Blue grama, Bad River	0.50
Prairie junegrass	0.10
Sandberg bluegrass, High Plains	0.25
Western yarrow	0.10
Scarlet globemallow	0.20
Fernleaf biscuitroot	1.50
Purple prairie clover	1.00
Prairie coneflower	0.10
Fourwing saltbush, Wytana	2.00
Wyoming Big sagebrush	2.00
Total Pounds of Pure Live Seed per Acre	18.00