APPENDIX I: MINE PLAN

The mining activity proposed with this submission consists of two proposed pit sequences on the Rusty and Frontier 2 bentonite beds (71T and 99T) to begin August of 2011 or as soon as this mine application is approved. Table MP-1 includes a listing of projected legal descriptions and disturbance acreages for each proposed pit sequence.

TABLE MP-1. PROJECTED DISTURBANCE LOCATIONS AND ACREAGES

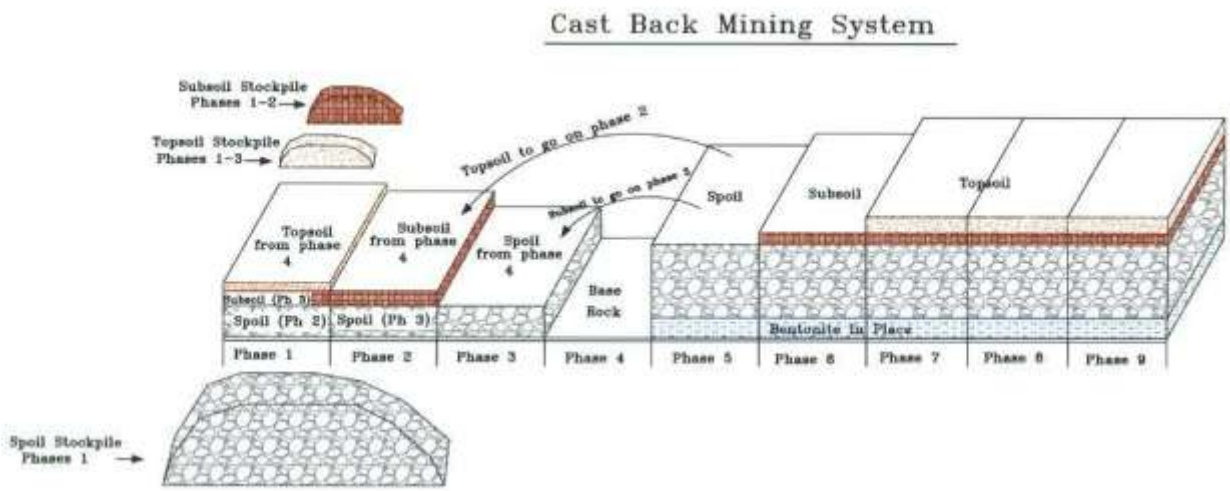
PROPOSED PITS	TWP. RGE. SECTION	PROPOSED DISTURBANCE ACREAGE
71T	T43N R95W 5,6,8,9,10 T44N R95W 30, 31 T44N R96W 25, 36	147.4
99T	T43N R95W 4,5 9 - 11 T44N R 95W 30-32	123.7
HAUL ROADS		25.7
POTENTIAL DISTURBANCE AREAS	T43N R95W 4,5,6,8-11 T44N R95W 30-32 T44N R96W 25,36	203.6
TOTAL PROPOSED DISTURBANCE		500.4

These will all be open pit bentonite mines excavated using standard castback mining techniques and procedures. Castback mining is a technique that is beneficial both environmentally and economically on many levels. Figure MP-1 shows a model of the castback system as described:

1. In this process, overburden from the first open pit (phase 1) of a pit sequence is usually piled and contoured adjacent to the first open hole (sometimes referred to as an out-of-pit overburden pile). Top and subsoil are also stockpiled separately in the same general area. At the earliest opportunity, the original overburden pile from Phase 1 is then contoured to match existing topography, after which at a later date, subsoil and topsoil is spread from existing soil piles in preparation for seeding. If soil stockpiles will be in place longer than one year, they will be seeded with a BLM approved perennial grass species.
2. Once the bentonite is removed from phase 1, topsoil and subsoil is stripped from phase 2 and placed on existing piles from Phase 1; and the remaining overburden from the next open pit of the sequence (Phase 2) is cast into the open hole of phase 1.
3. Once the bentonite is removed from Phase 2, topsoil from Phase 3 is removed and placed on the existing pile from Phase 1 and 2. The subsoil is then castback into Phase 1 and the remaining overburden is cast back into Phase 2.
4. After the removal of bentonite from Phase 3, topsoil from Phase 4 is then cast onto contoured and previously subsoiled Phase 1; the subsoil is then cast onto Phase 2; and the remaining overburden from phase 4 is cast into Phase 3.
5. This process repeats itself until the end of the pit sequence. At this time, since there is not overburden available from another phase of mining, material to fill the last hole is acquired by reducing the highwall's steep grade, also known as a highwall reduction (see figure MP-3). The castback/ highwall reduction process provides ecological and economic pragmatism by promoting live topsoil distribution, as well as eliminating the need for long-distance transport of the original

overburden from phase 1. In many cases this distance can exceed a mile. The cost, energy, and equipment necessary for that effort are well above accepted norms.

Figure MP-1.



Environmentally, castback mining with a highwall reduction is beneficial on many levels. First, a pit sequence can take between five to ten years to complete. In this time, micro fauna residing in a deep stockpile effectively die before soils are spread. Degradation can occur due to soil compaction. Both of these conditions degrade a soil's ability to support desirable vegetation on reclaimed sites. Wyo-Ben prefers to conduct concurrent reclamation with the spreading of "live" soils to reestablish vegetation, resist erosion, and develop stable and productive habitats following disturbance. Complete blocks of reclamation started behind the final phases of mining would be impossible because of the need for access corridors to accommodate the hauling of material. Using the castback mining procedure greatly reduces the amount of disturbance created when compared to older mining techniques where overburden was piled on the highwall and outcrop sides of the pit until commencement of backfilling.

Delineated areas are considered to be the limit of necessary disturbance required to accomplish reclamation of the last phase in a pit sequence. In most cases, less area than that shown on the mine plan map is needed to accomplish final fill and contour of the last phase and the disturbance boundary is therefore listed as "potential." Figure MP3 illustrates a typical highwall reduction sequence for pit 71T, a gentle-sloped highwall reduction.

A highwall reduction is accomplished by removing top and subsoil adjacent to the last phase, and dozing the underling material adjacent to the highwall into the open hole of the last phase. Once contouring of the last phase is complete, the area is then soiled using both material from the highwall reduction area, and a partial amount of saved soil from two or three previous phases.

The area of disturbance in the highwall reduction is determined by three factors. One is the depth of the highwall of the last phase. The second factor is the size of the phase; and the last factor is swelling of overburden as it breaks up during mechanized removal from the previous phase. In general, a deep highwall will require more disturbance in the highwall reduction area. Similarly, larger pits will require a larger reduction disturbance. Finally, if the overburden in the next-to-last phase has a high swell factor, there will be more material to go into the last phase of mining. This opportunity, when present, minimizes the area of disturbance required for the highwall reduction. Wyo-Ben intentionally reduces the size of its phases of mining as we progress through the pit sequence. When the last phase is reached, it is usually smaller than the first phases of mining, thus reducing the area needed for the highwall reduction.

Soil handling in castback mining is also more economically and environmentally sound than in older mine techniques. Stockpiling soil for long periods of time can be detrimental to the resource. Castback mining reduces or

eliminates stockpiling time. After the first phase of overburden is contoured in-place, it can be soiled with stockpiled top and subsoils obtained from the first few phases of mining. Upon backfilling and contouring of the first and subsequent phases of mining, soils can be spread "live" as it is being removed from subsequent phases. This reduces the degradation of soil microbes, and increases vegetation establishment due to seed propagules contained in the soil. It reduces the cost of soil redistribution by decreasing the amount of material handling. Wyo-Ben will also salvage suitable material below subsoil that is chemically and physically beneficial or neutral to vegetation establishment. This practice allows placement of a buffer between the more detrimental spoil material and the top and subsoil, thus increasing the chance of establishing a diversity of desirable vegetation.

Pit delineation boundaries establish the limit of the resource that is economically viable to extract, based on market demands. Often, due to various economic or physical conditions, Wyo-Ben may not disturb to the limits shown or requested in the proposal. This routinely results in less acreage of disturbance than originally proposed. The width of disturbance indicated in Figure 1 of the environmental analysis is based on the geologic dip of the bentonite bed of interest. Steeply dipping beds usually result in a narrower pit than flatter-lying beds. When practical, Wyo-Ben will leave mosaics of undisturbed lands within the proposed pit sequence or between adjacent pit sequences which enhance reclamation aesthetics, and serve as a seed source for reclaimed lands. Pit area locations, boundaries and stockpile sites will be staked prior to disturbance. The C.O.P. and T.O.P. areas may consist of the following items: topsoil stockpiles, subsoil stockpiles, temporary bentonite stockpiles, camp sites for mine equipment, and overburden material from initial or subsequent phases of mining.

Table MP-2 lists specific volumes, disturbance acreages and projected mining dates for each proposed pit. Wyo-Ben anticipates annual mining of between 10 to 15 acres in the Potato Ridge Amendment/Update Area based on market demand.

TABLE MP-2. PROJECTED DISTURBANCE ACREAGE AND MINING DATES

PROPOSED PITS BEDS # OF PHASES	PROJECTED OPENING DATE	PROJECTED ENDING DATE	APPROXIMATE DISTURBANCE PER YEAR	AVERAGE OVERBURDEN PER PHASE*	PROPOSED DISTURBANCE ACREAGE
			ACRES	CUBIC YARDS	
71T (Rusty Bed)	August, 2011	2024	12.0	54,336	147.4
99T (F3 BED)	August, 2011	2023	12.0	49,264	123.7
HAUL ROADS					25.7
POTENTIAL DISTURBANCE AREAS					203.6

Figure MP-1, Meeteetse Draw Amendment/Update Material Flow Castback Mining Map illustrates general material movements, volumes, and final pit cut backfill strategies. Backfill of all other phases will be achieved during the castback sequences as illustrated in Figure MP-1. Topsoil (T.S.), subsoil (S.S.), temporary overburden stockpiles (T.O.P.), and contoured overburden stockpiles (C.O.P.) locations are illustrated on mine plan maps.

Existing bonded haul roads HR 27.2 will provide access to the proposed pits. Additional roads will be constructed as illustrated on the Mine Plan Maps 1, 2, and 3. These haul roads will cover a total of 78.0 acres, of which 25.6 acres occur outside the potential disturbance area or on private land. Haul roads will be constructed according to BLM standards including a crown and drainage ditch, with strategically placed water exit ditches to prevent pooling on roads.

RECLAMATION PLAN

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

Reclamation backfill will be achieved during the castback mining process using variously sized Caterpillar tractor-scrapers depending on availability. Wyo-Ben, Inc.'s mining contractors typically use Caterpillar 627 and 631 tractor-scrapers. These are supplemented with Caterpillar tractor-dozers ranging from D-8 to D-10 in size. The dozers are used for backfilling and contouring. Most drainage construction will be done using a backhoe excavator.

Final reclamation contours will be consistent with those necessary to reestablish the projected postmining land use goals of domestic livestock grazing and wildlife habitat. Final slopes and surface contours will approximate native gradients and will blend with adjacent topography. Through drainage will be reestablished in all backfilled phases. Ephemeral channels to be impacted by this proposed mining activity will be temporarily directed around open pits during active mining stages. Channel design for both temporary and permanent diversions will match pre-mine channel gradients and cross-sectional shapes. Temporary diversions will be designed to allow passage of peak runoff from a 2 year, 6 hour precipitation event in a non-erosive manner. Permanent diversions (including reconstructed channels and adjacent topography) will be designed to be erosionally stable during the passage of the peak runoff from a 100 year, 6 hour precipitation event.

Reclamation backfill will follow the castback mining sequence illustrated in Figure MP-1. Following backfilling and contouring, all compacted surfaces will be ripped to improve water infiltration and retention. Subsoil and topsoil will be replaced from stockpiles or hauled directly during the castback mining sequence. Average topsoil and subsoil redistribution depths are reported in Appendix II (Soils). Where necessary on initial pit cuts, out-of–pit overburden stockpiles will be contoured in-place and used for temporary bentonite (T.O.P.) and contoured soil stockpile locations (C.O.P. locations on the Mine Plan Map). Final reclamation of these areas will include deep-ripping, spreading topsoil/subsoil and seeding.

Wyo-Ben, Inc. will comply with the requirements found at 3809.420(3) regarding reclamation. Wyo-Ben, Inc. may consider alternative innovative techniques for reclamation in order to achieve bond release. Some of these innovative techniques may include pitting, broadcasting, drilling, or hydro-seeding, the crimping of straw, candy-striping of soil where there is little to spread, seed coating, additives to the soil (including but not limited to mycorrhizae, boron, gypsum, limestone, fertilizers, mulch, grass clippings, wood chippings, weed free manure, polymers, Geoskin hydromulch, Hydra matriCx Series, sugar), sagebrush seedlings, fencing, spraying of invasive species before and/or after mining, alternative irrigation techniques, sediment control weed free matting (straw and coconut), wattles (sediment stop, straw, excelsior), scourstop mats at the end of culverts, biodegradable check dams silt fences, alternative seed mixtures which may include approved non-native species, or other methods that will require BLM and WDEQ approval prior to the application.

Drill-Hole Plugging

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

Feasibility of Pit Backfill

Wyo-Ben utilizes a castback mining procedure when stripping pits. This method of mining is both economical and environmentally compatible. Handling overburden only once in the process of material movement during the stripping and reclamation process is an economical method of mining. Using the castback method allows reclamation to stay concurrent with mining as backfilling and contouring of a previous phase is occurring at the same time the current phase of a pit is being stripped. Moving material between phases of a pit is safer than pushing it laterally into the open hole over the highwall.

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

Wyo-Ben, Inc. characterizes the overburden from the surface down to the bentonite in each pit it plans to mine at a rate of approximately 1 hole per mile of proposed pit. In this process, a material sample is obtained every five feet down to the bentonite and sent to Intermountain Labs in Sheridan, Wyoming for testing of chemical and physical parameters. If it is shown that a particular pit has the potential for acidic, deleterious or toxic material near the surface, Wyo-Ben will attempt to cover it with at least two feet of a more neutral spoil material from adjacent pits in a lateral castback procedure, or bury that layer deeper in the profile during backfill. If deleterious material (bentonite, spoil) is intentionally placed on the surface, it will be bermed to prevent off-site sedimentation of the material.

Post Closure Management

Wyo-Ben monitors all of its reclaimed lands post closure for off-site sedimentation, erosion and seeding failures. Off-site sedimentation is controlled by installation of straw bail, fabric check dams, or Nilex GeoRidge biodegradable check dams into affected drainages.

Revegetation Techniques and Seed Mixtures

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

Seedbed preparations may include deep-ripping of compacted surfaces prior to soil replacement to break up the surface and loosen the contoured overburden. Additional surface manipulations such as deep parallel furrows on contour or pitting may be used to enhance moisture harvesting capacities of the areas receiving seed. Seed mixtures will normally be broadcast seeded, however they may be hydro-seeded or drilled as deemed necessary. In general, seeding will be conducted in the fall and early winter (prior to freeze-up) to take full advantage of fall, winter and spring moisture. BLM permits Wyo-Ben to exercise discretion to attempt spring seeding on areas where live topsoil has been directly placed during winter months to reduce destruction of native species volunteering during the first growing season and prior to what would be the fall seeding period. A cover crop may be planted in the situation that the anticipated seeding will not be done for more than a year. Although no negative grazing impacts are anticipated on newly seeded areas, attempts will be made to coordinate timing of use with the grazing permittee if problems develop. Reclaimed areas may be fenced if it is determined grazing may be detrimental to reclamation efforts.

Reclamation of haul roads will be accomplished by contouring to restore drainage patterns, remove culverts, and blend with surrounding topography. These areas will then be deep-ripped, subsoiled/topsoiled and seeded.

Composition of the proposed seed mixture is detailed below. Use of all species depends on seed availability in the year of seeding. Due to the mostly poor quality soils of the proposed disturbance area, BLM permitsWyo-Ben wto use a less diversified seed mix as shown for the Mowry and Thermopolis Shale formations.

Seed Species	Rate-lb PLS/acre
Gardner saltbush (*A. gardneri*)	3.0
Big sagebrush (*A. tridentata*)	2.0
Fourwing saltbush (*A. canescens*)	2.0

Rubber Rabbitbrush (*Chrysothamnus nauseosus*)	2.0
Russian wildrye (*Elymus junceus*)	1.5
Sandberg bluegrass (*Poa sandbergii*)	1.5
Bluebunch Wheatgrass (*Agropyron spicatum*)	1.0
Western Wheatgrass (Agropyron smithii)	0.5
Evening primrose (*Oenothera pallida*)	0.5
Annual sunflower (*Helianthus annuus*)	1.0
Biscuitroot (*Lomatium ambiguum*)	1.0
	16.0 lb/acre

This mixture may be supplemented with Basin wildrye (*Elymus cinereus*) broadcast onto uplands and reconstructed drainages and other low-lying areas at a rate of 0.5 to 2 pounds per acre and Fringed Sagewort (*A. frigida*) at a rate of 0.5 to 1.0 pounds per acre. Monitoring of past reclamation successes and failures during concurrent onsites with BLM & DEQ may influence seed mixture composition and surface preparation techniques.

Quality Assurance

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