



Environmental Assessment

M-I Swaco “Bear Creek 2” Plan of Operations Modification: Wheeler Haul Road Upgrades and Revised Vegetation Mapping & Soils Salvaging Procedures (WYW-182569); Big Horn County, Wyoming

Location:

6th P.M. Big Horn County, WY

T. 53 N., R. 92 W. Sec. 17: E $\frac{1}{2}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$

Sec. 20: N $\frac{1}{2}$ NW $\frac{1}{4}$

Applicant/Address:

M-I Swaco

P.O. Box 832

Greybull, WY 82426

DOI-BLM-WY-020-EA15-036

April 2016

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

DOI-BLM-WY-020-EA15-036

Table of Contents

1.0. PURPOSE AND NEED FOR ACTION.....	6
1.1 Introduction and Background	6
1.2 Purpose & Need	6
1.3 Relationship to Statutes, Regulations, Plans or Other Environmental Analyses	7
1.4 Scoping and Public Involvement	8
1.5 Issue Identification.....	8
1.6 Issues not Carried Forward for Analysis	8
2.0 PROPOSED ACTION AND ALTERNATIVES	9
2.1 Description of the Proposed Action (Alternative I).....	9
2.2 Alternative II.....	23
2.3 Conformance of Alternatives with Resource Management Plan	23
3.0 AFFECTED ENVIRONMENT	24
3.1 Physical Resources.....	24
3.1.1 Air Quality	24
3.1.2 Geologic Resources	24
3.1.3 Soils.....	24
3.1.4 Water.....	25
3.2 Mineral Resources	25
3.2.1 Locatable Minerals.....	25
3.3 Biological Resources	26
3.3.1 Vegetation	26
3.3.2 Fish & Wildlife Resources, Special Status Species	29
3.3.3 Invasive Species and Pest Management	30
3.4 Heritage & Cultural Resources	30
3.4.1 Cultural Resources	30
3.4.2 Paleontological Resources	30
3.4.3 Visual Resources.....	30
3.5 Land Resources	31
3.5.1 Lands and Realty.....	31
3.5.2 Rights-of-Ways and Corridors	31
3.5.3 Recreation	31
3.5.4 Livestock Grazing management	31
3.6 Socioeconomic Resources	31

3.6.1 Socio-economics	31
3.7 Health and Safety	32
4.0 ENVIRONMENTAL EFFECTS	32
4.1 Physical Resources.....	32
4.1.1 Air Quality	32
4.1.2 Geologic Resources	32
4.1.3 Soils.....	33
4.1.4 Water.....	33
4.2 Mineral Resources	33
4.2.1 Locatable Minerals.....	33
4.3 Biological Resources	33
4.3.1 Vegetation- Forests, Woodlands, Grassland, and Scrubland Communities	33
4.3.2 Fish & Wildlife Resources.....	33
4.3.3 Special Status Species.....	34
4.3.4 Invasive Species and Pest Management	34
4.4 Heritage & Cultural Resources	34
4.4.1 Cultural Resources	34
4.4.2 Paleontological Resources	35
4.4.3 Visual Resources.....	35
4.5 Land Resources	35
4.5.1 Lands and Realty.....	35
4.5.2 Rights-of-Ways and Corridors.....	35
4.5.3 Recreation	36
4.5.4 Livestock Grazing management	36
4.6 Socioeconomic Resources	36
4.6.1 Socio-economics	36
4.6.2 Health and Safety.....	36
4.7 Cumulative Effects of the Proposed Action.....	36
4.8 Residual Impacts of the Proposed Action.....	39
5.0 STIPULATIONS, MITIGATION AND MONITORING MEASURES	40
6.0 PREPARATION AND REVIEW.....	44
6.1 List of Preparers.....	44
6.2 List of Reviewers	44
7.0 SOURCES CITED.....	45

Appendix A – Weed-Free Seed Use on Lands Administered by the Bureau of Land Management
(BLM Seed Policy IM-2006-073)..... 47

Appendix B – BLM Wyoming Reclamation Policy IM-2012-032 49

ENVIRONMENTAL ASSESSMENT

M-I Swaco “Bear Creek 2” Plan of Operations Modification: Wheeler Haul Road Upgrades And Revised Vegetation Mapping & Soils Salvaging Procedures (WYW-182569); Big Horn County, WY

1.0 Purpose and Need for Action

1.1 Introduction and Background

The Bureau of Land Management has received an application from M-I Swaco for a Plan of Operations Modification to allow inclusion of, and construction upgrades to, portions of the existing “Wheeler” haul road, as well as accommodate revision of soils salvage and vegetation mapping procedures for the entire “Bear Creek 2” Plan area located northeast of Greybull, Wyoming.

This proposed modification falls under the Surface Management regulations at 43 CFR 3809. The application is hereafter referred to as the “*Bear Creek 2 Plan Modification: Wheeler Haul Road Upgrades and Revised Vegetation Mapping/Soils Salvaging Procedures*”, which is also herein referred to as the “Proposed Action”. This Plan of Operations Modification, if approved, would add up to 11.96 acres of new haul road-related disturbance on federal lands, add an additional 10.61 acres of haul road under the current reclamation bond, and allow for implementation of revised soil salvaging and vegetation mapping procedures applicable to the entire M-I’s Bear Creek 2 mine plan area. The original approved Bear Creek 2 Plan of Operations area of mining disturbance and schedule is unchanged by this Plan Modification.

1.2 Purpose & Need

The need for this Proposed Action is established by the BLM’s responsibility to the rights of entry and use under the General Mining Law of 1872, as amended; and the requirements in the regulations at 43 CFR 3809.

The primary purpose of the Proposed Action is to allow the Operator, M-I Swaco, to construct properly-designed upgrades to portions of the existing “Wheeler Road” as shown on the maps in Figures 1 and 2, below. Approval of the Plan Modification would allow M-I to upgrade the more primitive sections of the “Wheeler Road” on BLM-administered lands in Sections 17 and 20, T. 53 N., R. 92 W., from its current condition, to a haul road with a 60-foot corridor width, and a 30-foot running surface, built to BLM and Mine Safety and Health Administration (MSHA) standards for public safety and commercial hauling of bentonite clay from mine to mill. BLM must review the submitted Plan of Operations modification to ensure it would prevent unnecessary or undue degradation, and ensure proper reclamation bonding for each year of haul road and related disturbance. The Plan modification would also allow for and acknowledge revised vegetation mapping and soil salvaging procedures for the entire plan area that have been improved since the original Bear Creek 2 Plan of Operations was authorized in under WYW-153901.

Decision to be Made

The Authorized Officer (AO), in this case the BLM-Cody Field Manager, must determine whether or not the Proposed Action (Alternative I), or the No Action Alternative (Alternative II) would result in significant impacts to the human environment. If not, the determination is documented in a “Finding of No Significant Impact” (FONSI) as part of the EA. If the impacts are determined to be significant, preparation of an Environmental Impact Statement (EIS) would be necessary, prior to Plan of Operations approval.

The Decisions to be made include:

- (1) Approve the Plan of Operations Modification as submitted, with additional stipulations, mitigation and monitoring measures as determined necessary by BLM during NEPA review; or
- (2) Disapprove/withhold approval of the Plan of Operations Modification, because the Plan would result in unnecessary or undue degradation of the public lands.

1.3 Relationship to Statutes, Regulations, Plans or Other Environmental Analyses

The BLM is required under the General Mining Law of 1872, the Surface Resources Act of 1955, the Federal Land Policy and Management Act of 1976, and the surface management regulations at 43 CFR § 3809, to review Plans of Operation for compliance with the regulations, and to ensure the mining plan would not cause unnecessary and undue degradation as defined in 43 CFR § 3809.5. The No Action Alternative (Alternative II) could only be selected if the proposed Plan of Operations Modification is determined to result in unnecessary and undue degradation of the public lands.

Unnecessary or undue degradation means conditions, activities, or practices that:

- (1) Fail to comply with one or more of the following: the performance standards in §3809.420, the terms and conditions of an approved plan of operations, operations described in a complete notice, and other Federal and state laws related to environmental protection and protection of cultural resources;
- (2) Are not “reasonably incident” to prospecting, mining, or processing operations as defined in §3715.0-5 of this chapter; or
- (3) Fail to attain a stated level of protection or reclamation required by specific laws in areas such as the California Desert Conservation Area, Wild and Scenic Rivers, BLM-administered portions of the National Wilderness System, and BLM-administered National Monuments and National Conservation Areas.

State Statutes and the WDEQ-LQD/BLM MOU: In Wyoming, the Wyoming Department of Environmental Quality – Land Quality Division (WDEQ-LQD) administers and enforces all state statutes and regulations dealing with mining and reclamation in Wyoming, including on federal lands. The WDEQ-LQD’s authority derives from the Wyoming Environmental Quality Act, and the LQD Non-Coal regulations, which are related to Article 4 of the Wyoming Environmental Quality Act (W.S. 35-11-401 through 437).

WDEQ-LQD has the authority to require permitting and licensing of all surface mines, and works in conjunction with the BLM under a Memorandum of Understanding (2003) for mines proposed on federal lands. Each mine/permit area is required by statute and regulation to be covered by a reclamation bond, in the event the operator for some reason is not able to fulfill reclamation requirements. M-I would be required to post such a bond prior to any surface disturbance. These bonds are reviewed annually by the WDEQ-LQD and BLM to ensure they are adequate to cover the amount of disturbance taking place in a given year.

Prior NEPA Analysis: No prior specific NEPA analysis has been conducted that would address the proposed Wheeler Road upgrades, or changes in vegetation surveys and soil salvaging as described in this EA. The EA prepared for the original Bear Creek 2 Plan of Operations (WYW-153901 Plan of Operations Modification, EA NEPA Number WY-020-EA08-001/011) addressed a now outdated mode of vegetation mapping and soil salvaging for the entire plan area. It also provided detailed baseline information on these resources.

1.4 Scoping and Public Involvement

Internal scoping relative to the Proposed Action (Plan modification) was conducted by the BLM CYFO in 2014, during the process of reviewing the plan modification, and after it was determined complete. Public scoping was determined not to be necessary prior to preparation of this EA. Public scoping for this Proposed Action includes placing this Environmental Assessment on the BLM Cody Field Office NEPA Register at its inception, announcing the availability of this EA in a newspaper of local circulation via Public Notice, and placing the EA online for a 30-day public review and comment period, prior to issuing a decision on the Proposed Action.

1.5 Issue Identification

Primary staff concerns include effects of the upgraded road to fences and gates, the need for improved functioning gates on all fences affected, and the potential for impacts to migratory birds and raptors living in the area. Cultural resource concerns along the Wheeler Road were the primary issue during internal scoping. The Plan Modification was declared complete on January 6, 2015, and NEPA analysis was then initiated.

1.6 Issues not Carried Forward for Analysis

The Proposed Action would have no effect on species listed under the Endangered Species Act, or their habitat. Other resources not affected by this Proposed Action include: Cave and Karst resources, Leasable and Salable Minerals, Fire and Fuels Management, Riparian and Wetland Vegetation, Wild Horses, Renewable Energy Resources, Lands with Wilderness Characteristics, Special Designations, and Environmental Justice.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Description of the Proposed Action (Alternative I)

(a) Operator Information: M-I Swaco
c/o Mr. Dan Close, Senior Geologist
P.O. Box 832
Greybull, WY 82426

(b) Proposed Plan Modification Area:

A general location map of the area is provided in **Figures 1 and 2**. The legal description of the Wheeler Road area to be bonded under this Plan Modification, with proposed new surface disturbance related to haul road upgrades:

T. 53 N., R. 92 W.: Section 17: E $\frac{1}{2}$ E $\frac{1}{2}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ E $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$
Section 20: N $\frac{1}{2}$ N $\frac{1}{2}$ NW $\frac{1}{4}$

Total new surface disturbance proposed due to Wheeler Road upgrades: 11.96 acres

The legal description of the Wheeler Road area (existing haul road) to be bonded under this Plan modification, where no additional surface disturbance is proposed is:

T. 53 N., R. 92 W.: Section 19: N $\frac{1}{2}$ N $\frac{1}{2}$
T. 53 N., R. 93 W.: Section 24: N $\frac{1}{2}$ N $\frac{1}{2}$

Total new area of road to be included in the Plan Modification with no new surface disturbance proposed: 10.61 acres

(c) Description of Wheeler Haul Road Upgrades:

The Wheeler Road is one of the existing access roads that connects M-I's Bear Creek, Beaver Hill and Lone Tree mine series, and is currently without formal authorization. This Plan Modification addresses inclusion of this road into the "Bear Creek 2" Plan of Operations, and WDEQ Permit 278C boundary. This road lies in Sections 16, 17, 19, 20, 21, T.53N., R.92 W., and in Section 24, T. 53 N., R. 93 W.

The table below lists all lands involved with the Wheeler Road portion of the application. Lands highlighted in yellow are those BLM-administered public lands proposed for new surface disturbance along the Wheeler Road corridor in Sections 17 and 20, T. 53 N., R. 92 W. All other lands listed below are not under analysis in this EA, as they are either not being proposed for new disturbance, or involve patented or state lands.

BLM lands proposed for new disturbance under this Plan Modification: A total of 11.96 acres of public land would be disturbed related to new haul road upgrades along the Wheeler Road in Sections 17 and 20, T. 53 N., R. 92 W., and a total of 10.61 acres of public lands in Sections 19, T. 53 N., R. 92 W., and Section 24, T. 53 N., R. 93 W., as listed above, would *not* be disturbed (existing haul road), but would be added to, and bonded under this Plan Modification (**Table 1**).

These changes would properly allow inclusion of the Wheeler Road into the Bear Creek 2 Plan of Operations.

Table 1. Bear Creek 2 Modification: Wheeler Road POO and LQD Bond					
NOTE: This WYDEQ bonded/BLM POO connects with BLM WYW-014172A to the west, and WYW-142419 to the east. Lands highlighted in yellow are proposed for haul road construction upgrades.					
A) BLM Road Section	Length	Width	Miles	Acres	Legal Description
1	8665.41	50	1.64	9.95	N2N2 24, T53N/R93W and N2N2 19 T53N/R92W
2	5019.54	50	0.95	5.76	N2N2NW Sec. 20 & E2E2SW Sec. 17, T53N/R92W
3	4709.85	50	0.89	5.41	E2E2NW and N2NE Sec. 17, T53N/R92W
<u>Sub-Total</u>	<u>18394.80</u>		<u>3.48</u>	<u>21.11</u>	
B) Private/State Road Section	Length	Width	Miles	Acres	Legal Description
1	156.78	50	0.03	0.18	NWNENE Sec. 19, T53N/R92W
2	685.56	50	0.13	0.79	NENESW Sec. 17, T53N/R92W
3	6250.10	50	1.18	7.17	W2 Sec. 16 & NENW Sec. 21, T53N/R92W
<u>Sub-Total</u>	<u>7092.44</u>		<u>1.34</u>	<u>8.14</u>	
C) Total Road Added to Bear Creek 2 Plan (A + B)	<u>25487.24</u>	50	<u>4.83</u>	<u>29.26</u>	
D) Lands Added to LQD App. C (Lands Out of Permit 278C)	Length	Width	Miles	Acres	Legal Description
1	237.26	50	0.04	0.27	NWNE Sec. 24, T53N/R93W
2	2673.30	50	0.51	3.07	NESENE Sec. 24, T53N/R93W & NW Sec. 19, T53N/R92W
3	894.92	50	0.17	1.03	NENW Sec. 20 and SESW Sec. 17, T53N/R92W
<u>Sub-Total</u>	<u>3805.48</u>		<u>0.72</u>	<u>4.37</u>	

Equipment proposed to be used: M-I owns and operates the following equipment to conduct work in their mine areas and under the proposed Plan Modification:

- | | |
|--------------------|-------------------------|
| 6-637 Cat Scrapers | 1-Komatsu 300 Track Hoe |
| 1-D6M Dozer | 1-980G Loader |
| 1-D9L Dozer | 2-John Deere Tractors |
| 1-D9R Dozer | 2-Water Trucks |
| 1-D10R Dozer | 2-Cat 14 Blades |
| 1-D10T Dozer | 1-D11R Dozer |

M-I would follow the procedures described in the original Bear Creek 2 Plan of Operations, as well as within the Plan Modification submitted for the Wheeler Road upgrades. Topsoil would first be removed and salvaged to facilitate road improvements. This topsoil would be stockpiled along the edge of the right-of-way on public lands for later use in reclamation of the Wheeler Road.

Any upgrades to the Wheeler Road would be constructed as per BLM Manual 9113 (Road Standards) specifications with regards to design, culverts, and other parameters. Haul road specifications and cross sections are provided below as well as cattle guard and culvert information.

Road design: The Wheeler Road, when upgraded, would exhibit a crown with generally less than a three-percent slope (**Figure 3**). A typical schematic for a cattle guard installation is provided in **Figure 4**. Where the approved right-of-way width is adequate (**Table 2**), ditches, back-slopes, and topsoil buffers would be constructed to allow for drying and management of road surface materials. M-I is committed to confining equipment travel and road materials within the affected path of the right-of-way, and not onto the adjacent native topsoil. Where the right-of-way allowance is not adequate for material management, particularly with regards to mud and snow, turnouts would be constructed at strategic locations for the purpose of dumping snow and mud that is removed from the road surface. Turnouts would also be developed if visibility and safety issues exist, such as below and above dangerous curves, canyons, and some of the steeper grades. Additional turnouts may be constructed at intervals typical for the routine turn-around needs of road maintenance equipment and water haul trucks.

Dust Suppression: Dust control would be achieved by the watering, as necessary, of the Wheeler Road during active hauling operations and as specified by any site-specific WDEQ/Air Quality Division (AQD) permits. Two temporary water haul permits, for this purpose, have been issued to M-I by the Wyoming State Engineer's Office; one for Shell Creek water, the other for Big Horn River water.

Turnouts: Typical turnouts are crescent-shaped, and measure 65' wide at the top of the arch and 200' in length between the beginning points of the arch. Wing ditches may also be strategically placed for the purpose of draining water from topographic collection points. All topsoil is salvaged from a turnout area and properly stockpiled along the haul road corridor.

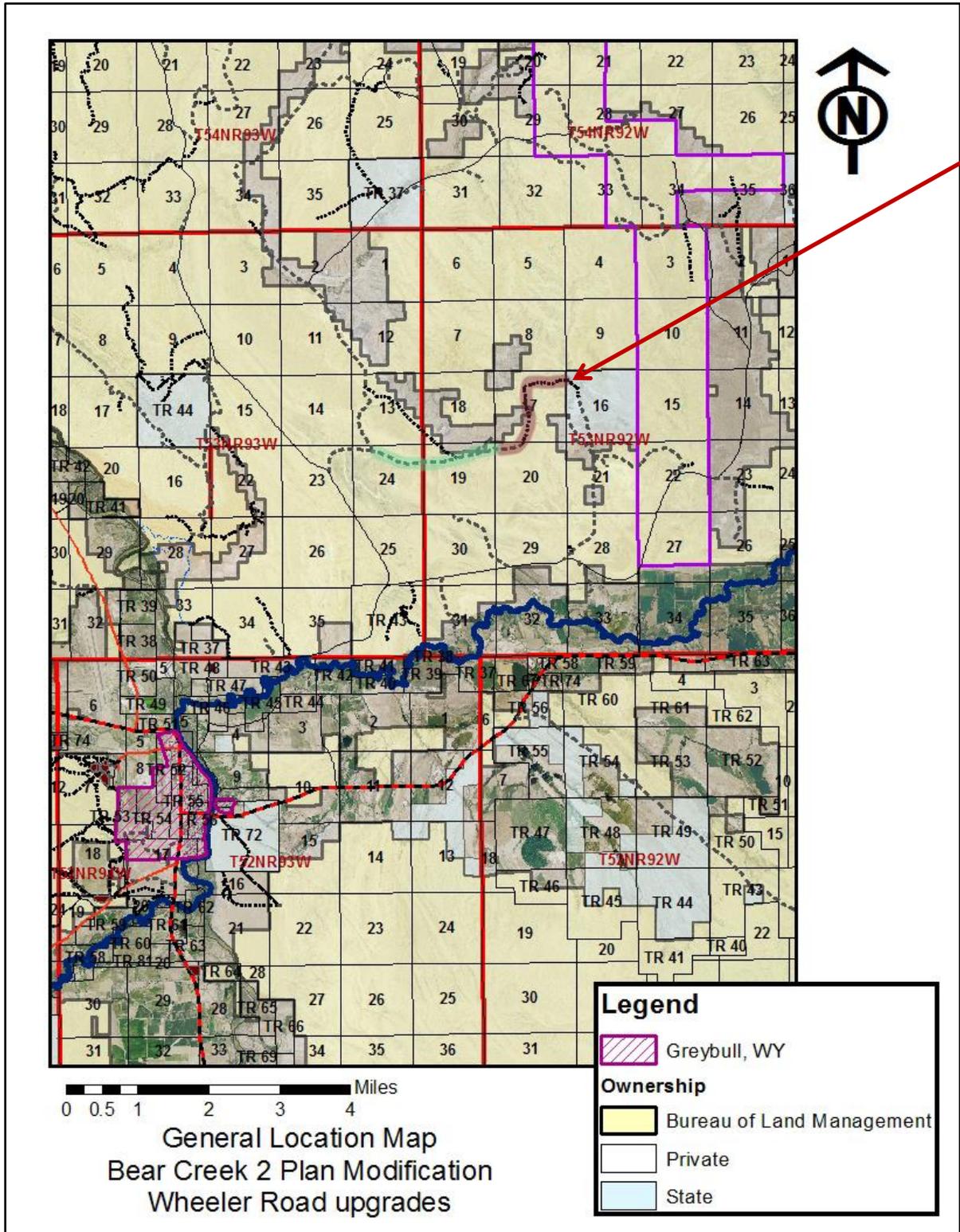


Figure 1. General location map of the Bear Creek 2 Plan Modification and surrounding area showing the Wheeler Road corridor under analysis in this EA. Red arrow points to the Wheeler Road point of beginning. Wheeler Road shaded in red is proposed for upgrade, and shaded in green is not proposed for upgrade.

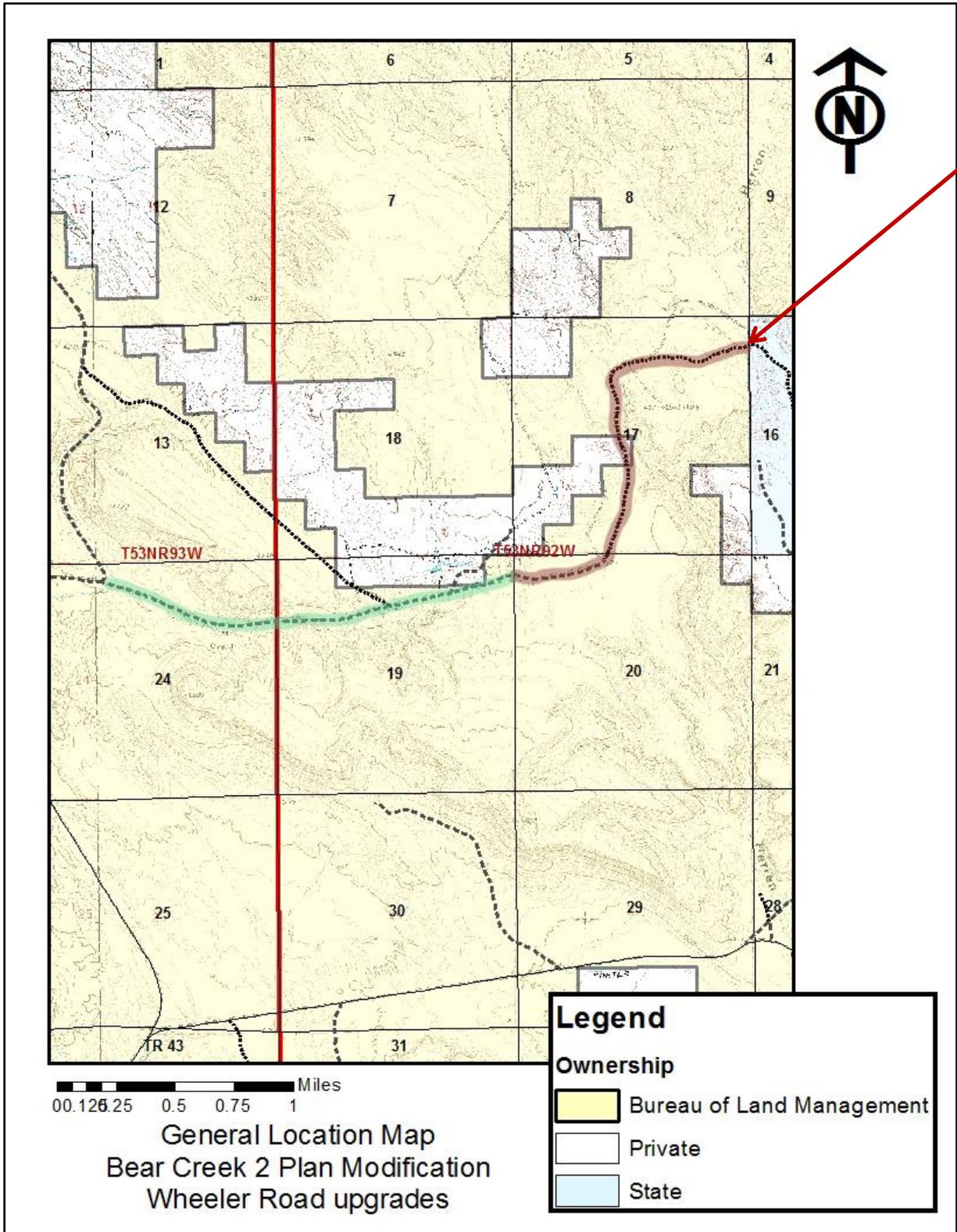


Figure 2. Location map of the Wheeler Road/Bear Creek 2 Plan Modification area. Red arrow points to Wheeler Road point of beginning. Portions of the Wheeler Road proposed for upgrade are shaded in red; those areas not slated for disturbance/upgrade but would be included in the Plan Modification, are shaded in green.

Table 2. Typical haul road dimensions and uses			
Type of Road	Typical Running Surface Width	Typical Total Disturbance Width (to include fill, cut, ditches, and back slopes)	ROW Application Widths
Trunk Roads	35'	70'	80'
Primary Haul Roads	30'	60'	60'
Secondary Haul Roads	18'	30'	40'
Access and Spur Roads	14'	18'	20'

Figure 3 illustrates a typical haul road profile as provided by M-I:

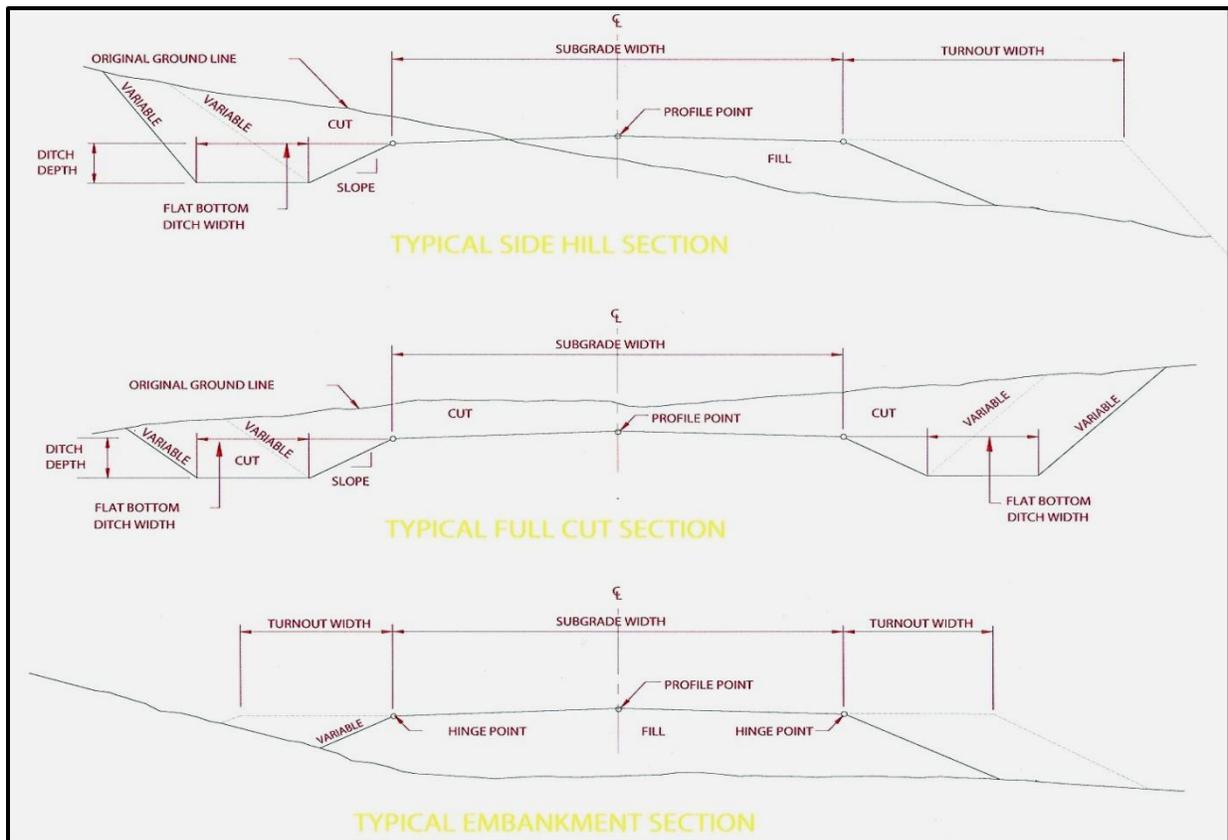


Figure 3. Typical Haul Road Profile

Ephemeral stream crossings: If upgrades to the Wheeler Road require establishment of an ephemeral stream crossing, said crossing would be constructed using either culvert installation, or establishment of a low-water crossing (ford) and in either case, to the degree possible, will be oriented perpendicular to the channel. M-I may elect to construct fords in cases where the stream channel is relatively shallow, on the order of three feet deep or less. Where fords are established, each entrance would be graded to a slope of 5(h):1(v) or less and the base lined with gravel and cobbles to assure traction and minimize rutting.

Culverts: Culvert design criteria are based on criteria outlined in Section 9113 of the BLM Manual and sizing based on estimated peak flow from the 10-year, 6-hour storm event. In no instance would a culvert smaller than 18-inches in diameter be utilized. When a culvert is installed, fill material is placed in one-foot lifts and compacted to reduce the potential for piping. The fill over the top of the culvert would be a minimum of one-foot in thickness, or one-half the culvert diameter, whichever is greater. If scour becomes a problem on either the upstream or downstream end of the culvert, protective armament would be installed. Culvert design sizing criteria are presented in the following table:

Diameter in inches	Flow in cubic feet/second (cfs)
18	9
24	16
30	30
36	50
48	85

M-I would temporarily divert, to the extent practical, any non-channelized surface water and/or flow from ephemeral channels to avoid roads, mine pits, and stockpiled material for any of the following reasons: (1) Assistance in controlling pollution of the Waters of the State, (2) Prevent or control of unnecessary erosion, (3) Protection of on-going mining and reclamation operations, and (4) Protection of downstream water rights.

The design and construction of such diversions would depend on the size of the feature to be protected or the volume of water expected. For example, stockpile protection can be addressed by the use of simple berms that are between 1 and 1½ feet in height. Interceptor ditches would be utilized to collect surface runoff from areas upslope of mining activity and route flows from native areas around the disturbance. In general, these diversions are constructed as V-ditches with 1½(h):1(v) side slopes. When an ephemeral channel is bisected by the operation or when the upslope drainage area is greater than approximately 40 acres, a trapezoidal shaped diversion channel would be constructed using a scraper or motor grader.

The gradient of either an interceptor or diversion channel would be generally less than 2% and would have sufficient capacity to convey the peak flow from the 2-year, 6-hour event as required by DEQ/LQD NonCoal Rules and Regulations. Prior to the final reclamation of a mine area, an understanding would be made between M-I, the WDEQ/LQD, and the BLM, as to whether or not the Wheeler Road would be reclaimed back to pre-upgrade status. These decisions will consider both the post-mine road length and width, and the removal or retention of culverts.

Reclamation Seed Mix for Wheeler Haul Road Upgrades: All disturbed areas would be revegetated with the following seed mix (**Table 3**) which is modified from the original reclamation seed mix originally approved for the entire Bear Creek 2 Plan of Operations area under WYW-153901. Compacted road areas would be ripped where necessary, and all hydrologic drainages reestablished. This mix and the application rates were cooperatively developed by representatives from M-I, Wind River Seed, Shell Valley Consulting, the DEQ/LQD, and the BLM. Deviations to the seed mix (if approved by WDEQ and BLM) would be detailed in the Annual Report to WDEQ-LQD and BLM.

Table 3. Bear Creek II Wheeler Modification General Native Seed Mix (Revised: 3/15/16)				
<i>These species will be <u>drill seeded</u>, at the listed rates, on all lands mapped premine as either SS or MS vegetation type</i>				
-	Details		1 Acre Mix	
	Seeds/ PLS Lb	Seeds/ Ft @ 1 Lb/Ac	Tot. PLS Lbs.	Seeds /Ft.
Gardner Saltbush <i>A. gardneri</i>	111,500	2.56	6	15.36
Fourwing Saltbush <i>Atriplex canescens</i>	52,000	1.19	2.25	2.69
Basin Wildrye <i>Elymus cinereus</i>	130,000	2.98	5	14.92
Bottlebrush Squirreltail <i>Sitanion hystrix</i>	192,000	4.41	2	8.82
Sandberg Bluegrass <i>Poa sandbergii</i>	925,000	21.24	0.5	10.62
Alkali Sacaton <i>Sporobolus airoides</i>	1,758,000	40.36	0.25	10.09
Sunflower Annual <i>Helianthus annuus</i>	58,000	1.33	2.5	3.33
Rocky Mountain beeplant <i>Cleome serrulata</i>	65,000	1.49	1.5	2.24
TOTALS			20	68.06
Additional Wildlife Shrub Species - Broadcast Application				
<i>These species will be broadcast, at the listed rates, as an addition to the General Mix on all lands mapped premine as MS vegetation type</i>				
-	Details		1 Acre Mix	
	Seeds/ PLS Lb	Seeds/ Ft @ 1 Lb/Ac	Tot. PLS Lbs.	Seeds /Ft.
Big Sagebrush <i>Artemisia tridentata</i>	2,500,000	57.39	2.0	114.78
NOTE: Big Sagebrush seed will be applied to 5% of all areas mapped, premine, as MS vegetation type.				
Winterfat <i>Krascheninnikovia lanata</i>	56,700	1.30	1.0	1.30
NOTE: Winterfat seed will be applied to 50% of all areas mapped, premine, as MS vegetation type.				
<i>Note: The above seed mix is in compliance with the BLM Wyoming Reclamation Policy Instruction Memorandum No. WY-2012-032</i>				

(d) Bear Creek 2 Plan Area: Revised Vegetation Sampling Procedures

General Location: The Plan Modification area is located approximately 9 miles northeast of Greybull, Wyoming. The nearest community is Shell, Wyoming. Elevations in the area range from 4,120 to 4,460 feet above sea level. The area lies within the 6-8 inch precipitation zone.

Previous Vegetation Inventories: During 2003, North Wind Environmental, Inc. of Greybull, Wyoming completed a vegetation baseline inventory in the areas within and surrounding the M-I LLC Bear Creek Claims permit area. Included in the inventory are maps corresponding to vegetation types of the area, photographic records of the area, a comprehensive plant species list, and data describing individual plant species, total vegetative, total (litter, rock and vegetation) cover and shrub density.

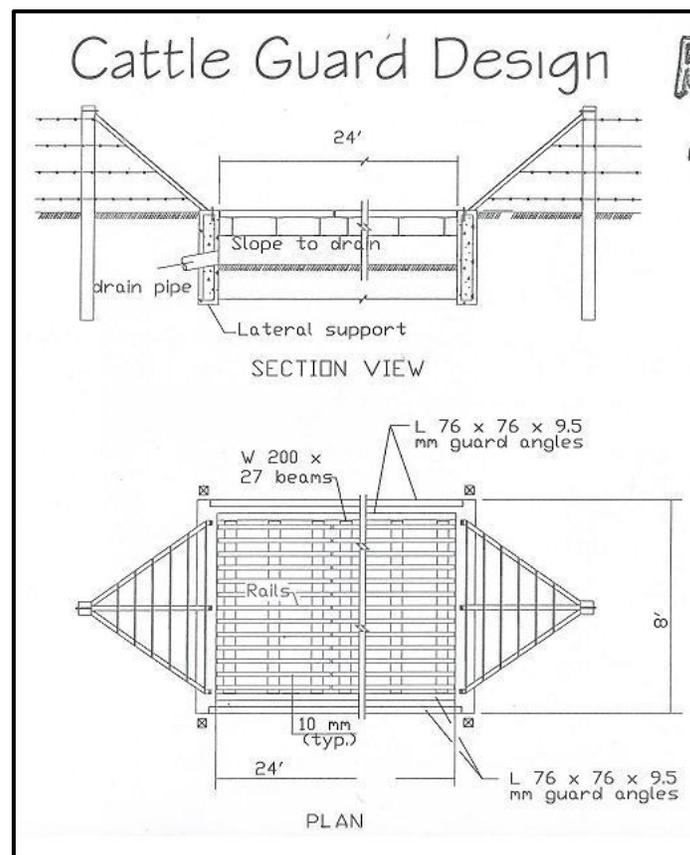


Figure 4. Typical cattle guard design.

Observations of nearly ten years of reclamation effort and revegetation performance at the Bear Creek and Lone Tree mine areas necessitated a re-evaluation in 2012 of premine vegetation types and their host soils. During this evaluation, it was determined that some of the lands originally mapped as "SDS" (salt desert shrub) vegetation type were dominated by annual forbs and grasses and, where these soils were used for reclamation topsoil, desired perennial species did not respond well.

M-I and WDEQ-LQD personnel determined that some of the clean (non-bentonitic) overburden used for capping material has actually been testing as highly acidic. Lands where this material was applied were separated from the original SDS Vegetation Community, and identified as Annual Forb Barren (AFB) community. As a result of the 2012 reevaluation, vegetation types for the Bear Creek 2 mine area were delineated into the following five (5) different map units:

- (1) **Big Sagebrush/Bunchgrass (BSBG)**
- (2) **Salt Desert Shrub (SDS)**
- (3) **Riparian**
- (4) **Barren**
- (5) **AML (Abandoned Mine Land-reclaimed area)**

The BSBG, SDS, and Riparian map units are defined as rangeland cover types, and described in Range Cover Types of the United States (Shiflet, 1994). Each area was characterized by the dominant plant community found within that particular area. Table 4 provides the premine vegetation status in the Bear Creek area. The most abundant rangeland cover type is salt desert shrub. Shrubs of 2-8 inches in height dominate this type. A comprehensive plant list was provided by M-I as part of this plan modification, and is provided in Addendum B of their application.

Table 4. Premine Vegetation Status				
(Reflects all Bear Creek/Lone Tree lands within Permit 278C, and does not reflect actual lands mined or proposed to be mined)				
<u>Veg Type</u>	<u>Vegetation Cover Acres (for determining <u>soil salvage</u>)</u>		<u>Vegetation Cover Acres (for determining <u>bond release performance</u>)</u>	
	<u>Totals</u>	<u>Percent</u>	<u>Totals</u>	<u>Percent</u>
SDS-Salt Desert Shrub	1493.2	63.3%	1669.7	93.5%
AFB – Annual Forb Barren	96.5	4.1%	included in Barren	
Barren	138.7	5.9%	575	32.2%
Riparian	26.1	1.1%	26.1	1.5%
BSBG-Big Sagebrush/Bunchgrass	89.2	3.8%	89.2	5.0%
AML SDS	176.5	7.5%	included in SDS	
AML AFB	172.1	7.3%	included in Barren	
AML Barren	167.7	7.1%		
*Note: Totals below reflect <u>all</u> inventoried acres			*Note: Totals below reflect actual acres that carry a revegetation requirement (all AFB and Barren acres have been removed)	
<u>TOTAL:</u>	<u>2360</u>	<u>100.0%</u>	<u>1785</u>	<u>100.0%</u>

(e) Bear Creek 2 Plan Area: Revised Soils Salvage & Replacement Procedures (2012)

Table 5. Soil Salvage and Replacement (Revised for entire Bear Creek 2 Plan area)	
1) SDS topsoil	
	Salvage the top 6".
	Spread as topsoil to a depth of 6" on suitable capping material (if no suitable capping material is available, then spread on clean overburden).
2) SDS alluvial sub-material (gravel, sand, and silt)	
	Salvage all available alluvial materials from beneath SDS topsoil.
	Spread as suitable capping material (minimum of 1' depth).
	Where there are insufficient volumes of SDS topsoil, spread this material as topsoil (minimum 6" depth on clean overburden).
3) AML vegetated topsoil (SDS, AFB, or Greasewood/Barren)	
	Salvage 4" of only those surface materials that are vegetated.
	Spread as topsoil to a depth of 6" on suitable capping material (if no suitable capping material is available, then spread on clean overburden).
4) Native AFB topsoil	
	Use as top dressing to blend reclaimed lands with the adjacent native.
	Spread only on lands intended to be post-mine barren.
5) Native Barren top material	
	Use as top dressing to blend reclaimed lands with the adjacent native.
	Spread only on lands intended to be post-mine barren.
6) Bedrock (non-soils)/Clean Overburden	
	These are any non-soil materials that do not contain bentonitic materials.
	Use only as cover material to bury bentonitic spoil.
	Not to be used as surface dressing.
7) Bentonitic spoil (low grade bentonite or bentonitic ash/waste)	
	This material will be buried at the bottom of the backfill profile.

Bond Release Criteria (Proposed): The 2012 survey boundary extends beyond lands proposed for mining under the Bear Creek 2 Plan of Operations (approved), and the boundaries of WDEQ Permit 278C. This extended reference area would be utilized for vegetation comparison when applying for bond release. At the time of applying for bond release, comparative transect data would be obtained from the extended reference areas.

All premine AFB and barren lands, whether AML or native, would be considered as barren acres for bond release calculations. AML SDS lands would be considered the same as native SDS lands for bond release calculations.

Through salvage of alluvium within mine areas, and application of this material as a topsoil substitute, M-I would attempt to reseed more than the required minimum aerial extent of lands for the plan area (904 acres). However, the performance standard for bond release would remain the 904-acre minimum.

A tabulation of premine acreage by vegetation type, and translation of that acreage to bond release acreage is presented below in **Table 6**. For determining bond release percentages by vegetation type, the footprint of all lands affected would be overlain on maps for analysis.

Table 6. Revegetation Requirements (based on 2012 vegetation mapping)				
The following acres reflect all post-1969 mining at Bear Creek/Lone Tree, to include lands proposed to be mined under the Bear Creek 2 Amendment				
<u>Veg Type</u>	Vegetation Cover Acres (for determining <u>soil salvage</u>) - Refer to Maps D8.1 and D8.2		Vegetation Cover Acres (for determining <u>bond release performance</u>)	
	<u>Totals</u>	<u>Percent</u>	<u>Totals</u>	<u>Percent</u>
SDS	797.3	63.3%	853.2	94.3%
AFB	59.4	4.1%	included in Barren	
Barren	115.4	5.9%	340.9	37.7%
Riparian	1.3	1.1%	1.3	0.1%
BSBB	49.8	3.8%	49.8	5.5%
AML SDS	55.9	7.5%	included in SDS	
AML AFB	93.9	7.3%	included in Barren	
AML Barren	72.2	7.1%		
*Note: Totals below reflect <u>all</u> mined acres			*Note: Totals below reflect actual acres that carry a revegetation requirement (all AFB and Barren acres have been removed)	
<u>TOTAL:</u>	1245	100.0%	904	100.0%

Drainage and Wetland Soil Salvage and Site Restoration: Several functional wetlands exist at Bear Creek, and all but the “N” drainage wetland (not yet evaluated), have been determined non-jurisdictional by the U.S. Army Corps of Engineers. As approved under the original Bear Creek and Bear Creek 2 plans, should M-I choose to mine through any non-jurisdictional wetlands, M-I would excavate and segregate the wetland soils and reconstruct the wetland in a position elsewhere within the same drainage and within the approved mine disturbance boundary. The wetland subsurface would consist of a contoured basin, similar in size and profile to the original feature, with a clay liner.

Reclaimed Channel Design relative to Soil Salvage: As approved under the original Bear Creek and Bear Creek 2 plans, post-mine topography would be constructed to blend in with native topography. Reclaimed channels would be constructed to tie in to native channels and incorporate native bedrock where possible.

The approach to reclaimed channel design varies somewhat from what is dictated by Wyoming Department of Environmental Quality – Land Quality Division (WDEQ/LQD) NonCoal Rules and Regulations which require stability for the 100-year, 6-hour event.

Within the Bighorn Basin as well as several other areas in Wyoming, channel stability is limited to flows associated with much more frequent events, such as those with a return period of between 2 and 10 years. Thus, the reclaimed channel evaluation is based on channel stability for the 5-year, 6-hour event and channel capacity for the 100-year, 6-hour event.

Baseline channel morphology studies indicate the presence of a pilot channel one to five feet in width, six to 18 inches in depth that is connected to a floodplain. The floodplain ranges from unconfined, where large flow events are allowed to spread across a substantial expanse of valley floor, to confined, where channels are well incised with one or more terraces.

Given equipment limitations, recreating channel cross-sections which exactly mimic pre-mine conditions is difficult. Equipment availability also limits the type of channel that can be constructed. In M-I's case, scrapers would be used; and minimum bottom width of a reclaimed channel would be 12 feet. This equipment limitation is a factor that must be considered in reclaimed channel design.

Two aspects of reclaimed channel slope must be considered during design: (1) reconnection of the reclaimed channel to native channel and (2) absence of any bedrock control that may have existed in the native environment that allowed steep channel slopes to be maintained. Discounting the effect of bedrock control in identified knick-point areas, analysis of native channel slopes indicated a range of 1 to 3.6 percent. Steeper slopes tend to exist in smaller watersheds or in the upper reaches of the larger watersheds. Steeper slopes are generally located in the upper parts of watersheds, or in reaches where the channel bed lies on a relatively resistant material.

M-I's reclamation plans do not include the development of actual post-mine topography, rather, spoil material is regraded to generally resemble topography that existed pre-mine. With this concept in mind, it can be reasonably concluded that there will be some change in drainage basin size and configuration, but generally each pre-mine drainage basin should be recreated on the post-mine landscape. Given the limitations described above, the following design parameters for reclaimed channels have been established:

- Channel capacity - design for the 100-year, 6-hour event
- Channel stability - design for the 5-year, 6-hour event
- Channel bottom width - 12' minimum
- Reclaimed Channel slope - not >2%; native channel slope dictates actual slope

Watersheds to be disturbed by previously-approved mining operations range in size from 10 to 1,000 acres. To evaluate channel stability, a relationship between the predicted 5-year/6-hour peak discharge and watershed area was developed. Peak discharges for various watershed sizes were estimated using the Office of Surface Mining's Rainfall-Runoff model STORM. The precipitation depth for this event is 0.9 inches, which was obtained from the NOAA Precipitation-Frequency Atlas of the Western United States – Volume II, Wyoming, 1973. For purposes of the stability evaluation, an average reclaimed watershed of 500 acres in size was selected. For a watershed of this size, the estimated peak discharge for the 5-year, 6-hour event is six cubic feet per second (cfs).

(f) Mitigation and Monitoring Measures proposed by the Operator:

a. Storm water and spill prevention plan: M-I, L.L.C, in cooperation with the DEQ/LQD District II Office and the DEQ/WQD State Office, developed a Storm Water Pollution and Prevention Plan. The intention of this plan was to define mine-wide procedures for storm water and spill prevention and control issues related to mining and hauling operations.

b. Interim stabilization plan for suspended operations: Should market conditions dictate the suspension of mineral extraction activities in any portion of the mine, all pit highwalls, drainages, overburden areas, and points of potential runoff will be stabilized and monitored (refer to Master Reclamation Plan, Section F: Reclamation Schedule for a discussion of M-I's commitment to reclamation timing). Stabilization will consist of the construction of clean buffers and berms between unsuitable and suitable materials. An example of this would be a 12' clean buffer, plus a containment berm, between a bentonite drying pad and any adjacent topsoil or suitable cover. In addition, sumps will be constructed at the low ends of mine disturbance to collect runoff water. Additional berms will be constructed for safety purposes along the top edges of pit highwalls, native escarpments and, where appropriate, the edges of public roadways. Also for safety, and to protect assets, M-I will remove all fuel tanks and equipment from the suspended operation.

M-I will subsequently place the suspended mine area on a compliance schedule as reported in the Annual Report: Compliance Appendix, to include a plan and timetable for remediation. This Report is provided, in March of each year, to the DEQ/LQD and the respective BLM Field Offices. Should the suspended operation be anticipated to extend beyond M-I's reclamation timing commitments, M-I will file an application for formal interim stability. M-I will monitor, quarterly with additional inspections occurring subsequent to large precipitation events, the area of suspended mine operations (refer to Part III, this appendix, for monitoring details).

c. Compliance monitoring: The mine permit process requires the collection of baseline data, conducted under WYDEQ/LQD approved methodologies, of all environmental and cultural aspects of the proposed disturbance. Special issues, as defined by baseline data, may suggest the need for additional monitoring efforts. These special requirements will be documented in the specific Mine and Reclamation plans, with compliance oversight provided by routine agency mine inspections, internal audits by M-I personnel, and subsequent reporting in each year's Annual Report. All active mining and reclamation areas are inspected monthly, with a standardized Mine Area Compliance Assessment form completed on each area. This standardized form generates a score for each area, qualified by each area's compliance with environmental and safety standards and practices, with all area scores summarized in a Mine Series Compliance Scorecard to provide month-to-month progress comparison.

d. Wildlife monitoring and protection: According to a February 2, 2004 United States Department of the Interior Fish and Wildlife (USFWS) letter (reference: ES-61411/BFF/WY7746), all areas within Permit 278C have been block-cleared from black-footed ferret habitat consideration, thus removing survey consideration of prairie dog populations within the permit area.

Prior to opening a new pit or area, (*BLM Addition: as well as upgrading any haul road*), M-I personnel will survey the site (*BLM Addition: within 72 hours of initial surface disturbance*), for the presence of raptors, sage grouse (specifically leks, nesting, and brood rearing), and migratory birds, to include sage sparrow, sage thrasher, vesper sparrow, lark bunting, mountain plover, horned lark, and Threatened and Endangered (T&E) species. In the action of performing these surveys, USFWS observation guidelines will be used. Plans for mitigating impacts to these species or their habitat are presented for agency approval in each site specific Update or Amendment.

e. Revegetation monitoring and protection: M-I voluntarily commits to monitor its revegetation efforts. Typically M-I targets one mixed shrub and one salt shrub vegetation community at the north end, and one community each at the south end, of Permit 278C for monitoring purposes. Each year's seeding at each of these sites are monitored annually to track, a) the progress of desired species, b) the success of experimental species, and c) the progression of noxious and invasive weeds. The monitoring protocol consists of both an MI, L.L.C. Reclamation Plan, Page RP-11 Master Permit 278C Rev: July 2015 inventory of all species and a cover estimate determined by a point intercept survey. In addition to the monitoring of annual seeding, M-I also monitors several weed treatment plots and other areas involving experimental techniques. M-I relies on the results of this monitoring data to revise its future seed mixes and to determine potential intervention strategies.

f. Additional mitigation and monitoring measures: Additional measures regarding dust suppression and sensitive species, as previously required and approved for the Bear Creek 2 Plan of Operations area, and which also apply to this Modification, are listed and described in Section 5.0 of this EA.

2.2 Alternative II

Alternative II is the “No Action” Alternative, under which the BLM would not approve the Plan Modification, if determined that it would cause unnecessary or undue degradation. The Plan Modification as described herein would not be approved, and no new haul road upgrades would be authorized, unless the modification was subsequently revised to prevent unnecessary and undue degradation of the public lands.

2.3 Conformance of Alternatives with Resource Management Plan

This Plan Modification has been reviewed to determine if the Proposed Action conforms with the Cody Field Office Approved Resource Management Plan, approved as a component of the Record of Decision (ROD) for the Rocky Mountain Region (September 2015). The Proposed Action is specifically supported by Record 2002, which states, “*Lands not formally withdrawn or segregated from mineral entry are available for mineral entry for bentonite, gypsum, and other locatable minerals.*”

The area proposed for haul road construction under this Modification has not been withdrawn from mineral entry; therefore it is open to mining claim location and subsequent mineral development after proper review and approval.

3.0 AFFECTED ENVIRONMENT

3.1 Physical Resources

3.1.1 Air Quality

No site-specific air quality data are available from the specific area involved in the Proposed Action, however, air quality in the area is considered to be generally good, and is in compliance with state and national ambient air quality standards.

Visibility in the region is typically very good (>70 miles) and fine particulates are generally considered to be the main source of visibility degradation. The air-shed within the area is classified as Class II, which generally allows concentrations of some air pollutants to increase to accommodate regional economic development.

3.1.2 Geologic Resources

The Bear Creek 2 area is located in the northeastern Bighorn Basin, Wyoming, where the dominant land uses are bentonite mining, wildlife habitat, and livestock grazing. Structurally, the area is situated east of the eastern flank of the Sheep Mountain anticline, north of Greybull, Wyoming, along a gentle synclinal basin. Strata in the project area dip gently to the southeast/northeast/east at less than 10 degrees. The Laramide Orogeny, a regional mountain-building episode that began during the late Cretaceous period, initiated the structural development of the modern Big Horn Mountains, and thus the ending of the Western Interior Sea. The Laramide Orogeny resulted in a series of anticlines, synclines, and various faults along the perimeter of the Bighorn Basin. These minor structures are responsible for the variable dip angles, and thus the variable outcrop patterns, of bentonite beds targeted by M-I for production.

3.1.3 Soils

Soils in the Bear Creek 2 area were inventoried as part of earlier investigations conducted for the original Plan of Operations, which provided a detailed site-specific soil survey based on morphological and physiochemical characteristics. Soil mapping and classification was conducted in accordance with the standards of the National Cooperative Soil Survey. Soil samples were taken from various sample locations, which were then analyzed for pH, EC, calcium, magnesium and sodium, Sodium Absorption Ratio (SAR), saturation percent, texture, and organic matter.

The Bear Creek 2 Plan area is characterized as an elevated plain composed of Cretaceous shales covered by alluvial outwash transported west from the Bighorn Mountains. The plain is dissected by ephemeral drainages and gullies exposing the shale bedrock.

A thin layer of silty eolian material covers most of the surface, and thicker eolian deposits are found on many of the east-facing slopes. The area is dominated by deep, well drained, fine-loamy and fine textured soils derived from alluvial outwash, eolian silts (12-28 inches of soil suitable for salvaging as topsoil), and sodic shale residuum (3 inches of soil suitable for salvage). Moderately deep and shallower soils occur on some backslopes.

Many of the subsoils are not suitable for reclamation as they contain a mixture of salts that include sulfates and chlorides of sodium and calcium. In addition, most of the soils have a considerable amount of exchangeable sodium, and with the abundance of salts have been classified as saline-sodic soils. Excess sodium indirectly affects plant growth through deterioration of soil structure. This breakdown of soil structure could result in restricted water movement, aeration, root elongation and seeding emergence and development. Slopes in the plan area range from 0% in level areas, to 40% along the sides of drainages.

A total of 12 different Soil Map Units are described for the entire Bear Creek 2 area (Appendix D-7 Plan binder). Soils were further classified into five general groups, described in more detail in **Table 7** below:

Table 7. M-I Bear Creek 2 Plan of Operations - SOILS	
(1) Deep Recent Alluvial soils	Torrifluvents; 0-5% slopes Sodic Haplocambids, 0-5% slopes, fine-loamy
(2) Deep soils derived in alluvial outwash and from shale	Sodic Haplocambids 0-5% slopes, fine-loamy Typic Haplargids, 0-10% slopes, fine-loamy Sodic Haplocalcids, 0-10% slopes, loamy-skeletal Typic Torriorthents, 3015% slopes, loamy-skeletal
(3) Deep soils derived in eolian silt and from shale	Sodic Haplocambids, 0-5% slopes, fine Sodic Haplocambids, 3-15% slopes, fine-loamy Lithic Torriorthents Complex, 15-40% slopes, fine-loamy
(4) Deep to shallow soils from shale residuum	Sodic Haplocambids, 15-40% slopes, fine-loamy
(5) Miscellaneous Map units	Barren shale lands, 1-20% slopes

3.1.4 Water

The Bear Creek 2 Plan Modification/Wheeler Road upgrades area includes a crossing of Herren Gulch, an ephemeral tributary to Shell Creek, which flows into the Bighorn River at Greybull, Wyoming. This crossing is included in the area proposed for haul road upgrades. No other haul road upgrades are proposed within perennial or intermittent drainages.

3.2 Mineral Resources

Locatable mineral resources are discussed below.

3.2.1 Locatable Minerals

Bentonite is the only known locatable mineral resource in the area of the Proposed Action. It occurs in economical quantities in three Cretaceous age formations – the Frontier Formation, Mowry Shale, and Thermopolis Shale.

Bentonite-bearing strata are generally composed of sodium bentonite beds of varying thicknesses interbedded with gray, marine shales and claystones which were deposited in the Cretaceous Interior Seaway approximately 99-106 million years ago.

3.3 Biological Resources

3.3.1 Vegetation

As described above, five different vegetation types have been determined for the area of the Proposed Action. These are described individually below.

Sagebrush/Bunchgrass: This vegetative map unit lies on broad mesas and gentle to moderately steep slopes. Mean slope throughout this map unit is 3.6%. Coarser soils (sands and sandy clays) predominate in this map unit. This vegetation type has a semi-rock surface, with exposed rock occurring on 12.1% of the transect data. Vegetation within this map unit is salt tolerant. Bare ground covers an estimated 44.5% of this area. Data read from the plots indicates the map unit is typical of most Big Sagebrush/Bunch Grass cover types. This site is dominated by big sagebrush (*Artemisia tridentata*) and bunch grasses such as bluebunch wheatgrass (*Agropyron spicatum*), Indian ricegrass (*Oryzopsis hymenoides*) and bottlebrush squirrel tail (*Sitanian hystrix*.)

Subdominant shrubs include Gardner saltbush (*Atriplex gardneri*), shadscale (*A. canescens*), green rabbitbrush (*Chrysothamnus viscidiflorus*), rubber rabbitbrush (*C. nauseosus*), broom snakeweed (*Gutierrezia sarothrae*), bud sage (*Artemisia spinescens*), fringe sage (*A. frigida*), skunkbush sumac (*Rhus trilobata*) and greasewood (*Sarcobatus vermiculatus*). Subdominant grasses observed were Sandberg bluegrass (*Poa secunda*), sand dropseed (*Sporobolus cryptandrus*) and needle and thread (*Stipa comata*). Forbs and succulents found in the area include prickly pear cactus (*Opuntia polycantha*), Woods phlox (*Phlox hoodii*), platyschkuhria (*Platyschkuhria integrifolia*), onion (*Allium textile*), pussy toes (*Antennaria anaphaloides*), milk vetch (*Astragalus barryi*), hairyseed parsley (*Lomatium foeniculaceum*), evening primrose (*Oenothera caespitosa*) and waxleaf penstemon (*Penstemon nitidus*).

Transect data show a total estimated vegetation cover of 22.8%, and total cover of 55.6%. Plant composition is dominated by shrubs and sub shrubs, which compose approximately 79.4% of the relative vegetation cover. Perennial grasses account for an estimated 14.5% of the relative cover, of which half is bottlebrush squirrel tail. Shrub density estimates from belt transect data forms suggest a total shrub density of 7,296 shrubs per acre. Big sagebrush occurs most frequently at 4,870 plants per acre.

Salt Desert Shrub: This cover type occurs on level to steep, sparsely vegetated areas and draw bottoms where finer and saltier soils are present. Mean measured slope is 3.9%. Total estimated vegetative cover is 17.7%, with total cover estimated at 44.3%. Rock covers 11% of the area, while bare ground accounts for 55.7% of absolute coverage. The dominant plant species in this map unit is Gardner saltbush, accounting for 80.7% of the vegetation recorded. Sub-dominant shrubs include big sagebrush, rubber rabbitbrush, bud sagebrush, shadscale saltbush, green rabbitbrush, broom snakeweed, and greasewood.

The dominant grass is alkali sacaton (*Sporobolus airoides*). Sub-dominant grasses include sand dropseed (*Sporobolus cryptandrus*), needle and thread, Indian ricegrass, tumblegrass (*Shenonardus paniculatus*), saltgrass (*Distichlis stricta*), and blue grama (*Bouteloua gracilis*).

Succulents observed in the area include prickly pear cactus. Perennial forbs include Woods phlox, flowery phlox (*Phlox multiflora*), platyschuhria, pearly pussytoes (*Antennaria anaphaloides*), small-leaf pussytoes (*Antennaria parviflora*), curly-cup gumweed (*Grindelia squarrosa*) and scarlet globe mallow (*Sphaeralcea coccinea*).

Annual forbs noted include halogeton (*Halogeton glomeratus*), clasping pepperweed (*Lepidium perfoliatum*), summer cypress (*Kochia scoparia*), Russian thistle (*Salsola kali*) and hoary machaeranthera (*Machaeranthera canescens*). Shrub density within the Salt Desert Shrub community is approximately 6,865 shrubs per acre.

Riparian: This cover type occurs mainly along the Bear Creek flood plain. Mean measured slope is 1%. Total estimated vegetative cover is 37.5%, with total cover estimated at 64.3%. Rock covers 1.1% of the area, while bare ground accounts for 35.7% of absolute coverage. The area is dominated by large woody shrubs including big sagebrush, which accounts for 29.9% of the relative plant cover, and greasewood, which accounts for 38.9% of the relative plant cover. Sub-dominant shrubs include bud sage, Gardner saltbush, rubber rabbitbrush, green rabbitbrush, coyote willow (*Salix exigua*), salt cedar (*Tamarix chinensis*), and broom snakeweed. Annual forbs, including halogeton, wild licorice (*Glycyrrhiza lepidota*) and prairie pepperweed (*Leppidium denceiflorum*), occur as 4.5% of the plant cover of these areas. The only perennial forb recorded was prickly pear cactus, however, sego lily (*Calochortus nuttallii*), and Indian paintbrush (*Castilleja chromosa*) were seen occurring in these areas. Grasses found here include Indian ricegrass, sand dropseed and inland saltgrass.

Native Barren: Areas which have less than one percent vegetation cover are labeled as Native Barren on the vegetation delineation map submitted by M-I. There are approximately 10.8 acres of these lands within the proposed disturbance.

Abandoned Mine Land (AML) Reclamation Area: Approximately 77.5 acres within the Bear Creek 2 Plan area were reclaimed by the Abandoned Mine Lands (AML) Division of the Wyoming Department of Environmental Quality. Of this acreage, 22.6 acres is barren and 54.9 acres is vegetated. Reclamation was difficult in these areas due to the lack of topsoil and records of previous plant composition and density. The AML portion of the permit area was sampled where the disturbance will occur and within 100 meters of the pit areas, along with an extended reference area of AML lands outside of the pit areas for comparison purposes. The vegetation map shows the AML areas within and outside of the pit areas. AML Barren areas were not sampled.

Plant composition within the AML area is dominated by Gardner saltbush, which accounts for approximately 5% of the total cover, and annual forbs, which account for approximately 7% of the total cover. Annual plants noted in the area include annual wheatgrass (*Agropyron triticeum*), cheatgrass (*Bromus techtorum*), halogeton, stickseed (*Lappula redowskii*), clasping pepperweed (*Lepidium perfoliatum*) and prairie pepperweed. Perennial grasses found in these areas include western wheatgrass (*Agropyron smithii*), blue wildrye (*Elymus glaucus*), alkali sacaton and Sandberg bluegrass. Sub-dominant shrubs include big sagebrush, shadscale and greasewood.

The AML reclaimed areas have a higher percentage (approximately 70%) of bare ground than the surrounding native vegetation communities, as well as a higher percentage of annual plants. Shrub density on the AML areas was measured at 3,181 shrubs per acre on the disturbance area and 4,581 shrubs per acre on the reference area.

2012 Vegetation Community Descriptions

The following descriptions apply to either native or AML lands only:

Native Vegetation Communities

Barren - <5% vegetation cover. Vegetation includes scattered annual forbs and *Sueda* with occasional fluvial pockets of Greasewood.

AFB - >5% vegetation cover dominated by annual forbs, chiefly *Atriplex dioica*, with scattered seepweed (*Suaeda sp.*), isolated Gardner saltbush (*atriplex gardneri*), pockets of greasewood (*sarcobatus sp.*), and occasional annual wheatgrass (*Agropyron triticeum*). Any pockets of perennial vegetation are associated with small areas that have captured wind-blown sediments and have slightly better soils. AFB communities include numerous disconnected barren surfaces. There was no vegetation sampling of this community type as it is dominated by annual species, which for practical purposes is assumed to barren lands as reclamation standards are based on perennial cover.

SDS (Salt Desert Shrub) - >5% vegetation cover typified by Gardner Saltbush with intermittent perennial grasses. SDS may include scattered Big Sagebrush and may include isolated pockets of other perennial shrubs, such as Rabbitbrush and Greasewood, where the topography harvests runoff water.

BSBB (Big Sagebrush/Bunchgrass) - This vegetation type was not re-evaluated in 2012. Refer to D8.3.1 for a description.

Riparian - This vegetation type was not re-evaluated in 2012. Refer to D8.3.3 for a description.

Abandoned Mine Land Vegetation Communities

AML SDS - These areas are sparsely vegetated with perennial shrubs, chiefly Gardner saltbush, and perennial grasses. Pockets of Greasewood may occur in drainage swales.

AML AFB - These areas are sparsely vegetated with annual forbs and annual grasses and may include occasional perennial shrubs, chiefly Greasewood.

AML Barren - These surfaces are composed primarily of bentonitic spoil, and are mostly void of any species of vegetation.

Greasewood Barren - Although not mapped as a vegetation community, Greasewood Barren is used to describe pockets of Greasewood located in parcels mapped otherwise as AML Barren. These pockets have developed in response to available surface moisture and offer, where the shrubs occur, a thin layer of salvageable topsoil.

3.3.2 Fish & Wildlife Resources, Special Status Species

Wildlife surveys in the general Bear Creek 2 area were initially conducted for M-I during the winters of 2000-2003. These surveys concentrated on big game, threatened or endangered species, migratory birds of high federal interest (MBHFI), nesting raptors, sage grouse, and wildlife habitats. This wildlife information includes data collected from both aerial and ground surveys, and includes comments from the Wyoming Game and Fish Department. Habitat and noted species information gathered during wildlife surveys were sent to the Wyoming Game and Fish Department (WGFD), and USFWS for their review.

USFWS's October 3, 2003 response letter indicated the possible occurrence of mountain plovers, nesting raptors, black-footed ferrets, Canada lynx, and migratory birds of high federal interest (MBHFI). USFWS also stated that the areas proposed for mining do not contain the proper habitat to support Canada Lynx. They did state however, that MBHFI habitat exists in the area and these species, such as mountain plover should be monitored. The following species (**Tables 8 and 9**) were noted in the proposed mining areas under the Bear Creek 2 Plan of Operations, including raptors and four BLM Sensitive Species:

Table 8. Wildlife Species – Bear Creek 2 Plan Area		
Common Name	Scientific Name	BLM Sensitive Species
Chukar Partridge	<i>Alectoris chukar</i>	
Sage Sparrow	<i>Amphispiza belli</i>	X
Golden Eagle	<i>Aquila chrysaetos</i>	X
Red Tailed Hawk	<i>Buteo jamaicensis</i>	
Greater Sage Grouse	<i>Centrocercus urophasianus</i>	X See Table 9
Mountain plover	<i>Charadrius montanus</i>	X
Common Nighthawk	<i>Chordeiles minor</i>	
Mammals	<i>Mammalia</i>	
Pronghorn Antelope	<i>Antilocapra americana</i>	

Antelope were the only big game animals observed during the wildlife study surveys on and around the proposed Bear Creek 2 area. According to the Wyoming Game and Fish Department, the proposed mine area is yearlong habitat for mule deer (North Big Horn herd unit) and pronghorn antelope (Big Horn herd). However, there were not many deer or antelope using this area in the winter, possibly due to the lack of nearby water, as Bear Creek is intermittent and frozen most of the winter. Deer were observed in this area during the summer while conducting vegetation surveys. Other wildlife observed, or noted from sign within the Bear Creek Claims permit area include bobcat, badger, coyote, fox, cottontail rabbit, and jack rabbit.

The leks listed in Table 9 are located outside the two-mile lek buffer. The Proposed Action is located within General Sage-Grouse Habitat, and therefore, a timing limitation is not recommended or required in this case.

Table 9. Known Sage Grouse Lek Locations – Bear Creek 2 Area	
Name	Location
Bear Creek #2	SW¼NE¼ Sec 25. T.54 N., R.93 W.
Lower Bear Creek	SW¼NW¼ Sec 30 T. 54 N., R 92 W.

3.3.3 Invasive Species and Pest Management

Though invasive weed species such as cheatgrass, halogeton, salt cedar, Russian thistle, kochia, and other non-natives are present in the general area of the Proposed Action, native plants are still the dominant species in the area of the Proposed Action. Weed species present are capable of quickly invading an area after a disturbance such as mining.

3.4 Heritage & Cultural Resources

3.4.1 Cultural Resources

A Class III cultural resource inventory meeting the requirements of the Wyoming State Historic Preservation Office (WYSHPO) Format, Guidelines, and Standards for Reports for the proposed mining area were conducted by Terra Alta Archaeology in August of 2013. The Class III survey identified no cultural resources and therefore; as per the Wyoming State Protocol between the BLM State Director and the Wyoming State Historic Preservation Office, the undertaking received a No Historic Properties Affected determination of effect. If cultural resources are noted during mining operations, M-I will follow all commitments as indicated in Master Permit, Archaeological and Paleontological Resources Appendix, and adhere to all stipulations required by the BLM Cody Field Office. The area in question contains no known areas or locations of religious or cultural concerns to Native American.

3.4.2 Paleontological Resources

The Cretaceous marine shales and sandstones of the Frontier Formation that dominate the Bear Creek 2 area are known for specific fossil resources such as ammonites. No known vertebrate or scientifically significant paleontological localities occur in the area of the Proposed Action. The areas proposed for potential surface disturbance due to Wheeler Road upgrades have been determined to have a Potential Fossil Yield Classification (PFYC) of 3a. Much of the area is covered with topsoil and vegetation, or is barren, actively weathering bedrock.

3.4.3 Visual Resources

The location of the Proposed Action falls into an area inventoried as and managed under VRM Class IV. The visual resource inventories rated the landscape within the scenic quality rating as low, and rated the sensitivity levels as low. The rating unit is described as a complex eroded landscape where bentonite mining and associated facilities detract from the natural landscape. The objective of this class is to provide for management activities that 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 landscape character elements.

3.5 Land Resources

3.5.1 Lands and Realty

Land use authorizations include various authorizations to use public surface for leases, including ROWs under Section 501 of FLPMA, permits, and easements under Section 302(b) of FLPMA; Recreation and Public Purposes (R&PP) leases under the R&PP Act of June 14, 1926 (43 U.S.C. 869 et seq.); and airport leases under the Federal Public Airport Act of 1928, as amended (49 U.S.C. Appendix, Sections 211-213). None of these types of authorizations are present in the area of the Proposed Action.

3.5.2 Rights-of-Ways and Corridors

The Wheeler Road is not currently authorized by BLM under any approved Right-of-Way action, according to the most recent version of the Master Title Plats. The Proposed Action would allow for inclusion of this road as described above, into the Bear Creek 2 Plan of Operations under a Modification, and allow for it to be bonded under that Plan.

3.5.3 Recreation

The area of the Proposed Action is located on BLM-administered public lands that have no specific recreation management prescriptions or designations, although dispersed and sporadic recreational use is recognized in the area. Due to active mining and hauling in the area, recreational activities are very limited in this area. Recreational activities observed in the project area include driving for pleasure/OHV use, hunting, hiking, rock hounding, and other similar types of occasional activities.

3.5.4 Livestock Grazing management

The Proposed Action is located within the North Shell Group allotment (#01538). This allotment contains a total number of 1,029 public animal unit months (AUMs) of grazing and forage, on a total of 21,844 acres, as per BLM databases. The areas proposed for haul road upgrades under this modification contain only minor amounts of forage suitable for livestock grazing. A total of 12 acres, or 0.05% of the allotment, and the forage it produces for livestock grazing annually, would be directly affected by the approval of the Proposed Action over time.

The Wheeler Road upgrades would affect two gap boundary fences which will need gates to be installed and maintained to allow passage of cattle through the fence.

3.6 Socioeconomic Resources

3.6.1 Socio-economics

The area of the Proposed Action is located in Big Horn County, Wyoming. The closest community is the Town of Greybull, WY, which is located about 8 miles south/southwest of the area, and has a population of 1,885 people (<http://www.city-data.com/city/Greybull-Wyoming.html>, Dec. 2013). In 2004, the estimated population of Big Horn County was 11,416 people.

Communities in Big Horn County include Basin (the county seat), Burlington, Byron, Deaver, Emblem, Frannie, Greybull, Hyattville, Kane, Lovell, Manderson, and Otto. Big Horn County covers 3,137 square miles and has a population density of 3.6 people per square mile. In the last three decades of the 1900s, its population grew by 12.3 percent. The area has a strong mining and agricultural economy, which includes farming (corn, sugar beets, alfalfa, barley, beans, hay) and ranching (cattle, sheep, horses). This area is also used for recreational purposes, such as hunting and off-highway vehicles.

In 2013, 24% of those employed in Big Horn County were employed directly by the mining and oil and gas industries. Other workers are employed in construction (13%), educational services (12%), retail trade (11%), manufacturing (11%), transportation and warehousing (7%), and public administration (6%) (<http://www.city-data.com/city/Greybull-Wyoming.html>). M-I conducts their own mining, and also contracts with various Big Horn County service companies to conduct mining activities within their permitted areas. These service companies provide heavy equipment and labor to strip and salvage soil and overburden, expose, mine and haul the clay, and conduct reclamation and seeding.

3.7 Health and Safety

No hazardous waste sites, abandoned mines, or other types of features hazardous to human health and safety are located in the area of the Proposed Action.

4.0 ENVIRONMENTAL EFFECTS

4.1 Physical Resources

4.1.1 Air Quality

The Proposed Action (Alternative I), if approved, would result in new surface disturbance of approximately 12 acres, which would have only a minimal effect on local air quality for a short time only. Addition of all other portions of the Wheeler Road would not involve new surface disturbance, and would therefore not affect local air quality.

The No Action Alternative (Alternative II) would have no effect on local air quality, as the haul road upgrades would not be approved.

4.1.2 Geologic Resources

The Proposed Action, if approved, would result in new surface disturbance of approximately 12 acres, but no effect on the local geology, as this new disturbance would take place adjacent to existing disturbed portions of the Wheeler Road.

The No Action Alternative would have no effect on local geology or geological resources, as the haul road upgrades would not be approved.

4.1.3 Soils

The Proposed Action, if approved, would result in new surface disturbance of approximately 12 acres, which would directly affect soils on these acres for the life of the mine. Topsoils and subsoils affected by road upgrades would be properly salvaged, stockpiled and seeded until reused in reclamation.

The No Action Alternative would have no effect on soils, as the haul road upgrades would not be approved.

4.1.4 Water

The Proposed Action, if approved, would result in new surface disturbance of approximately 12 acres, which may have a minimal effect on local water quality as a result of a minimal amount of soil disturbance and possible onsite-sedimentation. Mitigation measures take to reduce off-site sedimentation as a result of road upgrades would be required as a part of any approval of the Proposed Action.

The No Action Alternative would have no effect on local water quality, as the haul road upgrades would not be approved.

4.2 Mineral Resources

4.2.1 Locatable Minerals

The Proposed Action or Alternative II would not result in any new impacts to the bentonite resources, as the Proposed Action only involves upgrades to the Wheeler Road, and no additional mining of bentonite.

4.3 Biological Resources

4.3.1 Vegetation- Forests, Woodlands, Grassland, and Scrubland Communities

The Proposed Action, if approved, would result in a direct effect to approximately 12 acres of native vegetation located adjacent to the Wheeler Road corridor. This vegetation would be reestablished at the conclusion of mining and hauling in the area.

The No Action Alternative would have no effect on vegetation, as the haul road upgrades would not be approved.

4.3.2 Fish & Wildlife Resources

The Proposed Action, if approved, would result in new surface disturbance of approximately 12 acres, which would have a minimal, temporary effect on animals living in the vicinity of the Wheeler Road.

Raptors and other migratory birds living in the area, if nesting, could be disturbed by road construction during its duration, thus raptor nesting surveys would be required prior to beginning surface disturbing activities. Migratory bird surveys would need to be conducted during the nesting season (between the dates of April 10 – July 15), at least 72 hours before initial surface disturbance is to take place. Additional mitigation and monitoring measures may be requested by BLM after Plan Modification approval.

The No Action Alternative would have no effect on wildlife, as the haul road upgrades would not be approved.

4.3.3 Special Status Species

The Proposed Action, if approved, would result in new surface disturbance of approximately 12 acres, which would have a minimal temporary effect on special status species living in the vicinity of the Wheeler Road. These species were listed in Chapter 3. Raptors and other migratory birds living in the area, if nesting, could be disturbed by road construction during its duration, thus raptor nesting surveys would be required prior to beginning surface disturbing activities. Surveys of migratory birds during the nesting season (April 10 – July 15) would be conducted at least 72 hours before initial surface disturbance, as specified by BLM.

The No Action Alternative would have no effect on special status species, as the haul road upgrades would not be approved.

4.3.4 Invasive Species and Pest Management

The Proposed Action (Alternative I), if approved, would result in new surface disturbance of approximately 12 acres, which could cause invasive weed species such as cheatgrass and halogeton, or other noxious weeds to grow and become established. M-I would be required to treat for the presence of noxious and invasive weed species should this take place.

The No Action Alternative would have no effect on noxious and invasive species and pest management, as the haul road upgrades would not be approved.

4.4 Heritage & Cultural Resources

4.4.1 Cultural Resources

Potential impacts from the Proposed Action could include discovery of unanticipated, buried, cultural materials that were not located via surficial inspection. Any unknown cultural resources that exist in the proposed mining area that were not detected by the Class III cultural survey would be reported to the BLM, if found by M-I, as required in the Cultural Resources Stipulations. Improvement of haul roads could facilitate access to and within the project area, thereby increasing human presence and the potential for additional unauthorized surface collection and looting. The area under consideration contains no known areas or locations of traditional religious or cultural significance 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 Tribal consultation.

Under the No Action Alternative, there would be no additional impacts on Cultural Resources as surface disturbance under the proposed undertaking would not be approved. No impacts to Native American Religious concerns would occur under Alternative II, as the BLM would take no action that would adversely affect these areas/locations without consultation with the appropriate Native Americans.

4.4.2 Paleontological Resources

The Proposed Action could result in minor impacts to paleontological resources during construction of needed upgrades along the Wheeler Road, but any such effects would be minimal. The area is not known for any important paleontological site localities or excavations and only a moderate chance exists for vertebrate or scientifically significant paleontological resources to be present.

The No Action Alternative would have no effect on paleontological resources as the haul road upgrades would not be approved.

4.4.3 Visual Resources

The Proposed Action would result in widening of the Wheeler Road in Sections 17 and 20, T, 53 N., R. 92 W., located in a VRM Class IV area. Elements created by the proposed project will echo existing contrasting elements as observed within the project area. Impacts to visual resources in this area would be minimal and in keeping with the types of disturbances that may be approved in such a VRM classification. Mitigations from other affected resources addressing the proposed activity's surface disturbance will address and benefit VRM concerns. Alternative II would have no effect on visual resources, as the haul road upgrades would not be approved.

4.5 Land Resources

4.5.1 Lands and Realty

The Proposed Action, if approved, would have no effects on lands and realty actions, as none are proposed in this area. It would result in new surface disturbance of approximately 12 acres along the Wheeler Road, which would be considered part of a Plan Modification, and not a lands and realty-type action. Alternative II would have no effect on lands and realty either, as the haul road upgrades would not be approved.

4.5.2 Rights-of-Ways and Corridors

The Proposed Action, if approved, would have no effects on rights-of-way or corridors managed under the realty program, as it would be processed as a 3809 action under the Mining Laws. It would result in new surface disturbance of approximately 12 acres along the Wheeler Road, which would be considered part of a Plan Modification, and not a Right-of-Way action. Alternative II would have no effect on rights-of-way or corridors, as the haul road upgrades would not be approved.

4.5.3 Recreation

The Proposed Action, if approved, would result in new surface disturbance of approximately 12 acres along the Wheeler Road corridor, which would have only a minimal effect on recreational uses in the area during road construction. Road conditions in Sections 17 and 20, T. 53 N., R. 92 W. would actually be improved for incidental use by recreationists in the area.

The No Action Alternative would have no effect on recreational uses in the area, as the haul road upgrades would not be approved.

4.5.4 Livestock Grazing management

The Proposed Action, if approved, would cause a very small 12-acre reduction in the amount of forage available for livestock in the North Shell Allotment. This forage would eventually be replaced after haul road reseeding and reclamation. The Wheeler Road crosses two gap fences that would need gates installed to allow passage of cattle, if such gates are not already in place. Cattle guards may need to be widened and put under improved maintenance programs.

Alternative II would have no effect on livestock grazing management, as the haul road upgrades would not be approved.

4.6 Socioeconomic Resources

4.6.1 Socio-economics

The Proposed Action, if approved, would improve the ability of M-I to safely and efficiently haul bentonite from the Bear Creek 2 mine area to the nearby mill.

Alternative II may have a minor effect on area socioeconomics, as the haul road upgrades would not be approved, and proposed upgrades allowing improved efficiency and safety would not take place.

4.6.2 Health and Safety

The Proposed Action, if approved, would result in improved public safety as it would allow for haul road improvements and upgrades in Sections 17 and 20, T. 53 N., R. 92 W., which would in turn result in improved public safety.

Alternative II would have a negative effect on area health and safety, as the haul road upgrades would not be approved and proposed upgrades allowing improved efficiency and safety would not take place.

4.7 Cumulative Effects of the Proposed Action

Cumulative impacts are discussed generally in the Final Environmental Impact Statement for the *Proposed Cody Resource Management Plan (Cody RMP)* (May 2015). Typical activities are described in that document, and are incorporated by reference into this EA.

Cumulative impacts are those that would result from the incremental impacts of the Proposed Action or the No Action Alternative, when added to other past, present and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. These reasonably foreseeable future actions refer to future action projections, or estimates, of what is likely to take place when a given proposed action is implemented. They are not part of the Proposed Action, but are projections being made to allow estimation and analysis of future impacts, cumulative and otherwise, as required by NEPA.

This Environmental Assessment has combined the results of internal scoping, describing the Affected Environment, and determining the Environmental Consequences, with incorporation of a Cumulative Effects Analysis (CEA) of the Proposed Action, to delineate a cumulative effect of the project on the environment as per CEQ guidelines.

Past, Present, Reasonably Foreseeable Future Actions, and Incremental Effects

Past, present and reasonably foreseeable future actions in the area of the Bear Creek 2 Plan Modification are bentonite mining and livestock grazing. Therefore, these two major activities are discussed below as the primary land uses under analysis. The general analysis area selected for the Cumulative Effects Analysis (CEA) includes an area of approximately 6.5 miles in diameter, 33.2 square miles, or 21,248 acres out radially from the area of the Proposed Action.

Past Actions:

BENTONITE MINING: Bentonite mining has been taking place in the Bighorn Basin over the past fifty years. Four companies are currently mining bentonite in the Cody Field Office; companies working within the general CEA area include M-I and Wyo-Ben, Inc. According to the 2015 Annual Reports of the four bentonite mine companies in the Cody Field Office, approximately 18,460 acres have been directly affected by bentonite mining in the Cody Field Office. According to mine company annual reports, approximately 13,756 acres (75%) of the 18,460 acres have been reclaimed and reseeded. Approximately 925 acres (5%) were mined prior to the establishment of federal and state environmental law and were reclaimed by the Abandoned Mine Lands program; leaving the balance (3,780 acres or 21%) as active mining areas, or areas that have been mined but are pending final reclamation. About 21% of all areas that have been disturbed by bentonite mining have been released from bond in the field office. Reclamation success has not kept pace with mining disturbance over the past fifty years.

LIVESTOCK GRAZING: Livestock grazing has been, and continues to be, a major resource-use activity on BLM-administered public lands in the Cody Field Office and around the area of the Proposed Action. BLM grazing allotments are located throughout the entire field office, and grazing has occurred in the area for over 100 years by cattle and sheep. It is difficult to quantify the actual direct and indirect impact that livestock grazing has had on the landscape, because much grazing occurred prior to BLM quantifying pre-grazing conditions. Improper grazing practices in general can have long-term effects to vegetative communities. Rotational grazing strategies, reductions in authorized use, and utilization limits for key plant species have been implemented throughout the basin to reduce the impacts of grazing. Reclaimed areas are impacted by livestock grazing when livestock are not fenced out of such areas.

The effects of grazing can change from year to year depending upon how heavily the vegetation is grazed in relation to that year's vegetative forage produced.

Present Actions:

BENTONITE MINING: M-I has currently disturbed a total of 5,831 acres of land in their approved permit area, of which approximately 3,890 acres (~ 67%) have been reseeded and reclaimed, and about 1,008 acres (17%) have been released from bond. Since reclamation is conducted concurrently with mining, companies must reclaim disturbed lands as they mine.

LIVESTOCK GRAZING: Presently, the North Shell Allotment #01538 is stocked for cattle grazing at 1,029 Animal Unit Months (AUMs). The types and numbers of livestock and the number of days/seasons grazed in this allotment are not expected to change. Effects of grazing can change from year to year depending upon how heavily the vegetation is grazed in relation to that year's vegetative forage produced. Annual forage produced varies depending on precipitation and effects from previous years of grazing.

Reasonably Foreseeable Future Actions:

BENTONITE MINING: Sodium-bentonite deposits in Wyoming make up about 70% of the world's known supply, suggesting that bentonite mining will continue well into the future in Wyoming and the Bighorn Basin. It is currently economical to remove up to approximately 80 to 100 feet of overburden to extract bentonite. The BLM estimates another 10,000 acres of bentonite mining-related disturbance is likely to take place by bentonite mining companies in the Bighorn Basin in the reasonably foreseeable future. Over 2,000 acres of new mining disturbance has been approved but not yet mined, and an additional 5,000 acres of proposed mining has been proposed but not yet approved by the BLM. The Bear Creek 2 Plan Modification (Wheeler Road Upgrades) proposes to disturb an additional 12 acres of surface disturbance along the Wheeler Road to allow for haul road upgrades only; no new mining is proposed under this modification.

LIVESTOCK GRAZING: Livestock grazing on public lands has been occurring for over 100 years in the Bighorn Basin. Such land use is expected to continue in the future.

Incremental effect of each Alternative

Alternative I – Proposed Action

The Proposed Action (Alternative I) would incrementally add 12 acres of new surface disturbance to the past, present and reasonably foreseeable future actions that are related to the area, as the proposed haul road upgrades would be approved under this Alternative. This small amount of additional surface disturbance would add another 0.06% of the total amount of disturbance in the field office, to the area of under analysis. This is an insignificant amount of additional surface disturbance when compared to the overall disturbance caused by bentonite mining and livestock grazing in the area.

Alternative II – No Action Alternative

This alternative would add no additional impacts to the CEA, as the plan modification would not be approved.

Cumulative Effects Analysis Summary

Under the Proposed Action, the maximum total amount of new disturbance by M-I would be 12 acres, a very small amount of acreage considering the amount of mining that has been proposed and approved under M-I's Bear creek and Bear Creek 2 Plans of Operation. Approximately 1,200 acres of mining have been previously approved in the general Bear Creek area, which would be mined over the next two decades.

Based on the known affected environment and environmental consequences of the Proposed Action, the cumulative effects analysis relative to the Proposed Action indicates that, at this time, the incremental effects of the Proposed Action, coupled with other existing and planned land uses on wildlife habitats/species, vegetation, and soils, can be mitigated or reduced over time, depending on recovery time, adequate precipitation, and reclamation success, using the stipulations, BMPs, mitigation and monitoring measures outlined in the proposed Mine and Reclamation Plans, if approved by the WDEQ-LQD and the BLM, and properly implemented by M-I.

4.8 Residual Impacts of the Proposed Action

Alternative I: Proposed Action

The following are potential residual impacts that could occur as a result of the Proposed Action:

- 1) The Wheeler Road would be widened and upgraded in Sections 17 and 20, T. 53 N., R. 92 W., which would remain the case for approximately 20-30 years into the future. Ephemeral drainages may be slightly altered, and soils and vegetation would be modified from their original native conditions.
- 2) Reseeding of some disturbance would take place after road repairs are conducted, but not all seeded species may become reestablished. Weedy species may begin to become established along the Wheeler Road, and if so, could be present in the area unless properly treated. Changes in vegetation could also residually affect wildlife habitat quality.
- 3) The Proposed Action would involve removal of topsoil along areas of the Wheeler Road slated for upgrades. Such disturbance of topsoil may cause residual effects, as the biota within the soil and the soil's structure and chemistry would be modified during the process. Some soil would be lost to erosion during the construction process. Changes in topsoil quality would have a minimal but residual effect on reclamation success along the haul road, and on related resources such as wildlife habitat and grazing.
- 4) The Proposed Action would cause minimal residual effects to local small animals. The increase in use of the upgraded road may affect the ability of local small wildlife species to use the area.
- 5) The Proposed Action could have minimal residual effects on livestock grazing if vegetation does not become reestablished after reclamation.
- 6) The Proposed Action would not result in any unavoidable residual impacts to cultural resources, unless such resources were located during road construction and *not* reported to the

BLM authorized officer. Improvement of haul roads would facilitate access to the general area, thereby increasing the potential for additional unauthorized surface collection and looting. However, the Cultural Resource Stipulations listed in Section 4.3.2 would mitigate cultural resource residual impacts.

Alternative II: No Action

There would be no additional residual impacts under the No Action Alternative, as the proposed haul road upgrades would not be approved, therefore no new surface disturbance would be authorized.

5.0 STIPULATIONS, MITIGATION AND MONITORING MEASURES

(Note: The Authorized Officer as referred to below is the Field Manager of the BLM Cody Field Office).

Cultural Resources Mining Stipulations (compatible with the current 43 CFR 3809 regulations):

The operator 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 historical or archaeological site, structure, building, or object on Federal lands.

The operator shall immediately bring to the attention of the Authorized Officer any cultural resources that might be altered or destroyed on Federal lands by his/her operations. If archaeological, historical, or Native American resources are discovered, the operator 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 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.

Before a Plan of Operations is approved, the operator 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 paleontological) values discovered by the operator.

Archaeological Resources Protection Act

No person may excavate, remove, damage, or otherwise alter or deface or attempt to excavate, remove, damage, or otherwise alter or deface any archaeological resource located on public lands or Indian lands unless such activity is pursuant to an issued permit.

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

Paleontological Resources Mining Stipulations (compatible with the current 43 CFR 3809 regulations):

1. **Collecting**: The project proponent/Operator is responsible for informing all persons associated with this project including employees, contractors and subcontractors under their direction that they shall be subject to prosecution for damaging, altering, excavating or removing any vertebrate fossils or other scientifically significant paleontological resources from the project area. Collection of vertebrate fossils (bones, teeth, turtle shells) or other scientifically significant paleontological resources is prohibited without a permit. Unlawful removal, damage, or vandalism of paleontological resources will be prosecuted by federal law enforcement personnel.

2. **Discovery**: If vertebrate or other scientifically significant paleontological resources (fossils) are discovered on BLM-administered land during operations, the Operator shall suspend operations that could disturb the materials, stabilize and protect the site, and immediately contact the BLM Cody Field Office Manager (Authorized Officer).

3. **Avoidance**: All vertebrate or scientifically significant paleontological resources found as a result of the project/action will be avoided during operations. Avoidance in this case means "No action or disturbance within a distance of at least 100 feet of the outer edge of the paleontological locality".

Mitigation and Monitoring Measures

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.

Additional information on mitigation and monitoring requirements is provided above in the Mine Plan section.

Air Quality

To control fugitive dust generated by haul trucks, M-I would keep roads watered by using a truck mounted with a spray bar. A regular schedule of road watering is maintained by M-I in all active mining areas.

Water Quality

Storm water discharge permits: M-I will acquire any needed Storm Water Discharge Permit (s) from the WDEQ-WQD, and will comply with their provisions to ensure compliance with the federal Clean Water Act. M-I will also utilize BMPs and other management techniques described in the mine plan to minimize runoff and soil erosion within the area of potential effects.

Storm water and spill prevention plan: M-I, L.L.C, in cooperation with the DEQ/LQD District II Office and the DEQ/WQD State Office, developed a Storm Water Pollution and Prevention Plan. The intention of this plan was to define mine-wide procedures for storm water and spill prevention and control issues related to mining and hauling operations.

BLM Sensitive Wildlife Species, Raptors and Migratory Birds

General Mitigation: Prior to opening a new pit or area, *as well as upgrading any haul road*, M-I personnel will survey the site *within 72 hours of initial surface disturbance*, for the presence of raptors, sage grouse (specifically leks, nesting, and brood rearing), and migratory birds, to include sage sparrow, sage thrasher, vesper sparrow, lark bunting, mountain plover, horned lark, and Threatened and Endangered (T&E) species. In the action of performing these surveys, USFWS observation guidelines will be used.

Sage Grouse M-Is mitigation efforts would focus on protection of nesting and brood-rearing sage grouse, by conducting pre-disturbance ground surveys within immediate areas to be affected, if initial ground disturbing activities occur during nesting or brood-rearing periods (April 10 – July 15). If nests or broods are noted, operations will be delayed or temporarily relocated until grouse use is completed or moved. WGFD recommend avoidance of as much disturbance as possible to sage grouse during the lekking/nesting/brood-rearing season (March 1 – June 30).

Mountain Plover On the ground surveys would be conducted prior to roadwork, to ensure there are no mountain plover, or other migratory bird nesting sites in or near a given area. Mountain plover are now considered to be a Wyoming BLM Sensitive Species and are protected under the Migratory Bird Treaty Act (MBTA), 16 U.S.C. 703. In addition, the April 17, 2007 BLM Wyoming Instruction Memorandum WY-2007-018 outlines conservation measures that assist in protecting mountain plover and their habitat. In conformance with the IM and USFWS suggestions, M-I would conduct nest searches in plover habitat during ground disturbing activities between April 15th and July 15th. If nesting plovers are found, mining operations would halt until BLM and USFWS would be consulted for further action. Through this monitoring, no mountain plovers would be knowingly harmed during the proposed mining process.

Migratory Birds In order not to cause illegal “take” of protected species under the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act, M-I, L.L.C. will conduct ground surveys and nest searches within the immediate areas to be affected, prior to disturbance by heavy equipment, if initial ground disturbing activity occurs during nesting or brood-rearing periods (April 10 through July 15). If MBHFI nests/broods are noted, operations will be delayed until the WDEQ-LQD, USFWS and BLM Cody Field Office have been consulted. Through this monitoring, no MBHFI would be knowingly harmed during the proposed haul road upgrading, or any mining activities.

Raptors On the ground surveys would be conducted prior to any surface disturbing activities to ensure that no raptor nests would be disturbed. M-I personnel agree to mitigate potential impacts to raptors and raptor nesting sites by monitoring any nearby raptor nests in the spring of the year to determine species and activity status. The U.S. Fish and Wildlife Service (USFWS) and BLM would be notified if nest sites are discovered during mining activities, and appropriate mitigation would then be determined. Any active nest site would be evaluated for appropriate mitigation measures and buffer distance based on raptor species. Results of monitoring should be reported and provided to the USFWS and BLM.

If active raptor nests are located within 0.5 mile of proposed disturbances associated with this Proposed Action, M-I will follow the proposed survey and buffer protocols outlined by the USFWS. These include conducting at least three surveys during nest-initiation periods from early March through early June and maintaining a disturbance-free zone around active golden eagle nests of at least 0.5 miles during the nesting season (February 1 to August 15).

Invasive, Non-Native Species or Noxious Weeds

M-I would be responsible for managing all noxious and undesirable invading plant species in the disturbed active and inactive mine areas, as well as in reclaimed areas, including cheatgrass, 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 BLM and/or the Big Horn County Weed and Pest Department would be consulted by the operator/holder for control and eradication methods. Written approval from the Authorized Officer for the use of herbicides must be obtained prior to usage of herbicides.

Revegetation monitoring and protection: M-I has voluntarily committed to monitor its revegetation efforts during the life of the mine and after reclamation. Typically M-I targets one mixed shrub and one salt shrub vegetation community at the north end, and one community each at the south end, of Permit 278C for monitoring purposes. Each year’s seeding at each of these sites are monitored annually to track, (a) the progress of desired species, (b) the success of experimental species, and (c) the progression of noxious and invasive weeds. The monitoring protocol consists of both an M-I Reclamation Plan, , an inventory of all species, and a cover estimate determined by a point intercept survey. In addition to monitoring of annual seeding, M-I also monitors several weed treatment plots and other areas involving experimental techniques. M-I relies on the results of this monitoring data to revise its future seed mixes and to determine potential intervention strategies as necessary.

6.0 PREPARATION AND REVIEW

6.1 List of Preparers

Gretchen Hurley Geologist, Cody BLM
(Geology, Paleontology, Mineral Resources, Air Quality)

6.2 List of Reviewers

Kierson Crume	Cultural Resources
Destin Harrell	Wildlife, Migratory Birds, and Special Status Species
Alicia Brown	Riparian and Wetland Resources
Bradley Johnson	NEPA
Alicia Brown	Range and Vegetation
Paul Rau	Recreation and VRM
Cara Blank	Lands and Realty
Chad Krause	Assistant Field Manager for Minerals and Lands, Cody
Delissa Minnick	Field Manager, Cody

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Appendix A – Weed-Free Seed Use on Lands Administered by the Bureau of Land Management (BLM Seed Policy IM-2006-073)

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240
January 20, 2006

EMS TRANSMISSION 01/27/2006
Instruction Memorandum No. 2006-073
Expires: 09/30/2007

To: All Field Officials

From: Director

Subject: Weed-Free Seed Use on Lands Administered by the Bureau of Land Management

Program Area: All programs which place seed, or approve the placement of seed on public lands.

Purpose: This Instruction Memorandum (IM) describes Bureau of Land Management (BLM) policy for the quality of seed purchased by BLM for use on public lands.

Background: The BLM Manual Section 1745 (1992) establishes policy and guidance for transplantation, augmentation, and reestablishment of habitat on public land utilizing native, and when necessary, introduced plant species. This action will comply with all Federal and State regulations, restrictions, and requirements governing the release and distribution of non-native exotic plants, including weed seeds.

BLM's Partners Against Weeds – An Action Plan for the Bureau of Land Management, January 1996, outlines BLM's plan to prevent and control the spread of noxious and invasive weeds on BLM lands. In addition, the 1999 Executive Order No. 13112 on Invasive Species states that each Federal agency shall not authorize, fund, or carry out actions that are likely to cause or promote the introduction or spread of invasive species in the United States.

The BLM obtains/purchases native or introduced plant seed, from seed producers and collectors for stabilization, rehabilitation, or restoration of public land. Prior to BLM accepting seed from any source, all seed must be tested for noxious weed seed at official state seed analysis labs. Noxious weed seed is not allowed in certified seed according to individual State's Department of Agriculture seed law and the Federal Seed Act. It has been acceptable for the seed lot (excluding species on the State and Federal noxious weed seed list) to contain from 0.5 percent to 2.0 percent of other "weed" seed depending on the State. "Other weed seed" is defined as any non-noxious weed seed, such as cheatgrass (downy brome) or Russian thistle, in the State(s) of concern. When purchased, all seed must also be of certified quality or source-identified.

Policy/Action: All Field Offices are required to use seed on public lands that contain no noxious weed seed and meets certified seed quality. All seed to be applied on public land must have a valid seed test, within one year of the acceptance date, from a seed analysis lab by a registered seed analyst (Association of Official Seed Analysts). The seed lab results shall show no more than 0.5 percent by weight of other weed seeds; and the seed lot shall contain no noxious, prohibited, or restricted weed seeds according to State seed laws in the respective State(s). The seed procured for use on public land will meet the Federal Seed Act criteria. Seed may contain up to 2.0 percent of "other crop seed" by weight which includes the seed of other agronomic crops and native plants; however, a lower percent of other crop seed is recommended. Copies of the seed lab test results, including purity and germination (viability) rate, must be forwarded to the appropriate BLM office prior to seed application. If the seed does not meet the BLM and State/Federal standard for noxious weed seed content or other crop seed allowances, it shall not be applied to public land. All seed test results must be retained in the seeding project file.

The BLM State contracts for seed may be more restrictive with "other weed seeds" of concern as deemed necessary.

All donated seed or seed used for "mitigation or restoration" by contractors per a reclamation plan must meet BLM's noxious weed seed policy prior to use on public lands.

An exemption will be allowed for small reclamation projects, less than 20 acres or not to exceed 200 pounds of seed, which have an approved BLM reclamation or rehabilitation plan or permit. The seed will be accepted if accompanied by an official seed analysis report that provides documentation to show no noxious weed seed per State(s) weed law and no more than 0.5% other weed seeds. For this exception, any one of three seed test documents will be accepted:

1. A certified "blue" tag or tags.
2. An independent seed lab test.
3. A seed lab analysis supplied by a vendor either by seed lot or by seed mix.

Straw or mulches applied as part of seeding, stabilization, rehabilitation, or restoration projects on public lands must be certified to be weed seed-free.

Timeframe: Effective immediately.

Budget Impact: Approximately 80% of the seed used on public lands is purchased during a National Seed Buy (three times a year average) via a national seed contract. Under this contract, the seed must be tested prior to acceptance and payment. Therefore, there will be no new costs associated with the National Seed Buy. For offices and programs not currently testing their seed for noxious weeds or are approving project proponents to apply seed on public land without first testing for noxious weeds there will be a slight increase in the cost of seeding treatments. A typical seed test costs between \$120-220 per lot for purity, germination, and noxious weed seed analysis.

Manual/Handbook Sections Affected: None.

Coordination: Coordination for this IM has been with WO-200, WO-220, WO-230, WO-270, WO-310, ID-930, BC-660.

Contact: If you have any questions on policy, please contact Jack Hamby, National ES&R Program Lead, at (202) 452-7747 or via email at Jack_Hamby@blm.gov. Questions pertaining to seed test, viability, seed lot tags, or weed seeds should be directed to Scott M. Lambert, National Seed Coordinator, Idaho State Office, at (208) 373-3894 or by e-mail Scott_Lambert@blm.gov.

Signed by:
Lawrence E. Benna
Acting, Director

Authenticated by:
Robert M. Williams
Policy and Records Group, WO-560

Appendix B – BLM Wyoming Reclamation Policy IM-2012-032



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Wyoming State Office
P.O. Box 1828
Cheyenne, Wyoming 82009-1828



IN REPLY REFER TO:
3042 (921 Gamper) P

March 27, 2012

EMS TRANSMISSION: 4/2/2012
Instruction Memorandum No. WY-2012-032
Expires: 9/30/2013

To: District Managers and Deputy State Directors
From: Associate State Director
Subject: Wyoming Bureau of Land Management (BLM) Reclamation Policy

Program Areas: All Surface Disturbing Activities.

Purpose: Implement the Wyoming Reclamation Policy

Policy/Action: In order to ensure a consistent and science-based approach to reclamation, this Instruction Memorandum (IM) identifies ten reclamation requirements (see Attachments) that must be addressed when developing reclamation proposals for all surface disturbing activities. Addressing these ten requirements will help achieve both short and long-term reclamation success for site stabilization and eventual ecosystem reconstruction. The Wyoming Reclamation Policy was previously issued under IM No. WY-2009-022 which expired on September 30, 2010. This IM replaces IM No. WY-2009-022.

Background: Successful reclamation efforts are critical in maintaining an effective multiple-use land management program. Nearly all authorizations for surface disturbing actions are based upon the assumption that an area can and ultimately will be successfully reclaimed. Those seeking approval to conduct surface disturbing activities on Public Lands must include reclamation planning as part of their permit process and the BLM must make this requirement clear early in the permitting process. This IM applies to all BLM authorized actions including those initiated by the BLM.

Timeframe: Effective immediately.

Budget Impact: Savings to Project funds in the long-term.

Manual/Handbook Sections Affected: This IM will be supported with more detailed guidance including new reclamation bond standards and a statewide monitoring and reporting strategy.

Specific reclamation information, sample templates for both reclamation and weed management plans, and other technical guidance is posted on the Wyoming Reclamation web site (<http://www.blm.gov/wy/st/en/programs/reclamation.html>).

Coordination: The coordination and review of the Wyoming Reclamation Policy has been completed with the WY BLM Reclamation Team: Brenda Neuman, Mining Engineer, WSO; Ken Henke, Natural Resource Specialist, WSO; Adrienne Pilmanis, Botanist, WSO; Travis Bargsten, Physical Scientist, WSO; and Merry Gamper, Physical Scientist, WSO Lead. Other non-Wyoming BLM specialists, WO-310, the Wyoming Governor's Office (for review by all appropriate State Agencies), the University of Wyoming, some local Governments, and numerous interested reclamation professionals in private industry statewide.

Contact: Merry Gamper at 307-775-6272, and by e-mail at MGamper@BLM.gov.

Signed By:	Authenticated By:
Ruth Welch	Sherry Dixon
Associate State Director	Secretary

2 Attachments

- 1 - Wyoming BLM Reclamation Policy (6 pp)
- 2 - Wyoming BLM Oil and Gas Reclamation Plan Template (4 pp)

Distribution

Director (200), Rm. 5644, MIB 1	1 (w/o atch)
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