

**U.S. Department of the Interior
Bureau of Land Management**

**CR Minerals Company, LLC
Rocky Mountain Mine
Pumice Extraction
Environmental Assessment**

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1.0 PURPOSE AND NEED

1.1 INTRODUCTION

CR Minerals Company, LLC (CRM) has applied for a contract to mine subsurface pumice products administered by the U.S. Department of the Interior, Bureau of Land Management (BLM), Taos Field Office (TFO). CRM is interested in contracting the continued removal of pumice materials on 2 BLM parcels adjacent to their existing Rocky Mountain Mine (RMM) in Sections 33 and 34, T. 21 N., R. 7 E., Rio Arriba County, NM. The RMM is currently entirely located on private surface wholly owned by CRM. The BLM properties are located on 2 separate parcels of land east and west of the existing RMM on BLM surface. These parcels are referred to as BLM-East and BLM-West. The subsurface minerals on both parcels are Federal. The total rate and volume of pumice extraction projected in this Environmental Assessment (EA) is similar to that currently contracted under the existing New Mexico Mining and Minerals Division (NM MMD) Permit No. RA004RE.

Pumice reserves within the existing RMM boundary are limited. The pumice that has been extracted under the existing NM MMD permit has largely been sold to construction industry customers as “aggregate grade” for use in various construction project applications. However, a steady portion of CRM business comes from the supply of specification granular pumice materials and powders, developed from “mill grade” ore, for various industrial applications. CRM has operated the RMM continuously since its acquisition in 1998. The RMM is characterized by approximately 9 inches of topsoil overlaying highly variable thicknesses of overburden. Overburden varies from a few feet to over 45 feet thick. Below the topsoil and overburden, the desired pumice ore body also varies in thickness from a few feet up to 20 feet.

There are numerous industrial applications for pumice mined at the RMM including water filtration, abrasives, chemical carriers, construction, cosmetics, dental treatments, electronics, polishing, horticulture, paints and coatings, and many others. In order to meet demand specifications for all customers, pumice extracted at the RMM undergoes varying levels of processing. For construction industry customers, often times no processing beyond simple screening is required. For others, varying grades of refined powders with closely controlled tolerances are needed. CRM has constructed a Processing Mill located a few hundred feet west of US 84/285 in Ohkay Owingeh, NM that enables pumice material to be further processed to required specifications. As such, CRM is heavily invested in the current RMM site and surrounding lands for the continued removal of pumice material for delivery to the Processing Mill.

Currently, CRM owns and operates the RMM, a 141-acre pumice mine located about 5.5 miles west of Española, NM. Over the years, the RMM has changed ownership several times. The RMM was originally developed and mined in the early 1960’s. Since then, the mine has owned and operated by various entities. Then in 1998, CR Minerals Company, LLC purchased the mine and has been the sole operator ever since (CRM 1999).

The RMM is reached by driving ≈5.5 miles west from the intersection of State Highway SP-2541 (900) and U.S. Highway 84/285 (Figure 1). The access road to RMM is also identified in various documents as the Santa Clara Indian Reservation Road and 31-Mile Road (CRM 1999). This EA refers to this access road as 31-Mile Road from this point forward.

Any material extracted from the proposed BLM parcels would likely be used for similar purposes as those described above. CRM has applied for the contracted surface and subsurface use of ≈380.5 acres. Depending on the BLM decision, this acreage could be disturbed in the future by the requested mine extension. This acreage comprises less than 0.00002% of the 15,359,940 acres that comprise the greater BLM, TFO planning area (BLM 1988).

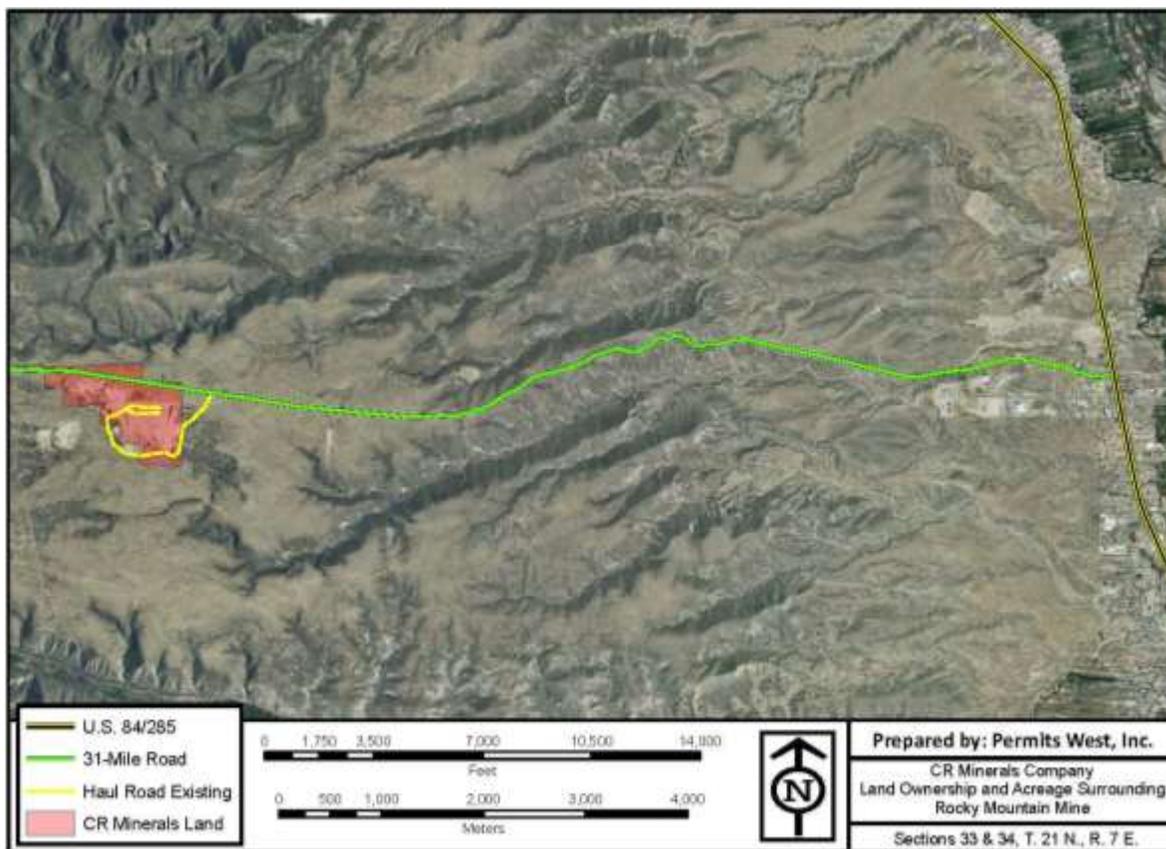


Figure 1. Location of CRM land and the existing Rocky Mountain Mine.

1.2 PURPOSE AND NEED FOR ACTION

The purpose of the action is to allow for the RMM extension in a manner which minimizes potential environmental effects and provides for the rehabilitation of affected lands. The expansion would provide an adequate supply of raw and processed pumice products for commercial and residential construction in the region, as well as continued supplies of specification granular products and powders for industrial applications that benefit the nation as a whole. High quality sources of pumice are critical for not only the region, but the entire nation. The expansion of the RMM would continue to provide Rio Arriba County and the entire region with a continuous source of high quality pumice products required for all types of public and private construction projects (residential, commercial, industrial, and landscaping) and industrial applications (water filtration, abrasives, paint and coatings, dental treatments, cosmetics, etc.).

The BLM needs to consider this action in accordance with its mandates under the Federal Lands Policy and Management Act (FLPMA) of 1976, which recognizes the development of mineral resources, such as pumice production, as a principle use of public lands. The BLM must provide for this development in accordance with the applicable land use plan, the 1988 Taos Resource Management Plan, as amended (BLM 1988).

1.3 DECISION TO BE MADE

Based on the information in this environmental assessment (EA), the BLM Field Manager will decide whether to approve the extension of the RMM operation or to reject the proposed action.

This EA discloses the environmental consequences of implementing the proposed action or alternatives to that action. The Finding of No Significant Impact (FONSI) describes the findings of the analysis in this EA. The TFO Field Manager is the Deciding Official. The Field Manager's decision, and rationale for that decision, will be stated in a Decision Record.

1.4 LAND USE PLAN CONFORMANCE

All elements of this EA are tiered from one BLM planning document, the October 1988, Taos Resource Management Plan, as amended. This planning document contains extensive information and guidance for each of the resources addressed in this EA and is incorporated here by reference. Only planning documents with direct relevance to the proposed RMM extension are discussed below.

1.4.1 CONFORMANCE WITH THE TAOS RMP, AS AMENDED (OCT. 1988)

The following management objectives are identified in the Taos Resource Management Plan (RMP), as amended with respect to mineral sales:

- “The objective of the minerals program is to provide the opportunity for development of mineral resources in a manner which minimizes environmental damage and provides for the rehabilitation of affected lands.” (p. 2-8) (BLM 1988)
- “It is the policy of the Bureau to make mineral resources available for disposal and to encourage development of these resources consistent with national objectives for maintaining an adequate supply of minerals at reasonable market prices. At the same time, the BLM strives to ensure that mineral development is carried out in a manner which minimizes environmental damage and provides for the rehabilitation of affected lands.” (p. 2-9) (BLM 1988)
- “Federal lands are the major source of mineral materials (primarily sand and gravel) for industrial, state, and local projects in Taos, Rio Arriba, and Santa Fe Counties. The Field Office is responsible for the sale, permitting, and inspection and enforcement programs for mineral material activity.” (p. 2-9) (BLM 1988)

The project area is not listed among the areas excluded from mineral leasing under the 1988 Taos RMP. The Taos RMP does identify a number of Special Management Areas (SMAs); however, the project area does not fall within or near the boundary of any SMAs or Areas of Critical Environmental Concern (ACECs) (BLM 1988).

1.4.2 STATEMENT OF CONFORMANCE WITH LAND USE PLANS

The Taos RMP, as amended (BLM 1988) has been reviewed and the proposed RMM extension would be in conformance with this land use planning document.

1.5 RELATIONSHIP TO STATUTES, REGULATIONS, OR OTHER PLANS

The Federal Water Pollution Control Act (Clean Water Act [CWA]) requires that stormwater discharges from mining related activities or operation comply with the Nation Pollutant Discharge Elimination System (NPDES) permit requirements. The action requires Best Management Practices (BMPs) be implemented for all construction and mining related activities and operations in order to minimize the discharge of pollutants in stormwater runoff to protect water quality. This action applies to all States, Federal lands, and Indian Country regardless of whether the U.S. Environmental Protection Agency (EPA) or a State is the NPDES permitting authority. States have the authority to regulate any discharges pursuant to state law, through a non-NPDES permit program.

Compliance with Section 106 of the National Historic Preservation Act (NHPA) are adhered to by following the BLM – NM State Historic Preservation Officer (SHPO) protocol agreement, which is authorized by the National Programmatic Agreement between the BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers, and other applicable BLM handbooks.

The Endangered Species Act (ESA) provides guidance and protection to sensitive species that require conservation measures. No Federal or State of NM listed wildlife species were located in the proposed

project area (Black 2010). Of the 16 plant species listed as rare in Rio Arriba County, NM, none were found in the project area (Devlin 2010). The potential for sensitive species to occur in the project area will be evaluated in Chapter 3 (Affected Environment) of this EA and in the attached Wildlife and Plant Survey Reports (Appendices A and B, respectively).

The Clean Air Act (CAA), as amended provides guidance and methodology to reduce airborne pollutants. Provisions of the CAA address acid rain, ozone depletion, and toxic air pollution in addition to establishing a national permitting program. Several other requirements and standards were also created in order to increase air quality and reduce negative effects to human health and safety.

1.6 IDENTIFICATION OF ISSUES BY RESOURCE

On September 14, 2010, the 30-day formal public scoping period was opened. A formal scoping letter was sent out on September 14, 2010 to all appropriate agency and government contacts as well as recipients on CRM's mailing list soliciting the general public to comment on the proposed Rocky Mountain Mine extension project. The formal scoping period closed on October 14, 2010 with no public comments received. However, one request for a map of the project area was submitted by Harijot to the BLM. The requested map was delivered to Harijot shortly following the formal close of scoping and no additional comments have been received.

On August 4, 2010, the proposed RMM project was discussed by TFO resource specialists at an interdisciplinary team meeting. Issues discussed included wildlife and consultation requirements on threatened and endangered (T&E) species, migratory birds, big game, traffic, water resources, site control, drainage, topsoil and waste pile management, trees as public resource, visual resources, air quality, grazing and land use, and potential alternatives to the Proposed Action. Follow up consultations were conducted with BLM resource specialists to clarify and resolve specific issues related to the scope of this analysis.

On May 5, 2011, an additional interdisciplinary team meeting was held with TFO resource specialists to reevaluate the proposed project and relevant issues and whether to include one alternative to the Proposed Action. BLM managers concluded that this EA will include analysis of one alternative. The Proposed Action and Alternatives are discussed in detail in Chapter 2 of this EA.

The proposed project was posted in the online NEPA log on August 10, 2011.

Based on these scoping efforts, the following resources have been identified as appropriate to analyze in further detail in Chapters 3 and 4 of this EA.

1.6.1 LAND TENURE AND USE

- Potential to disrupt or alter current land uses.

1.6.2 GEOLOGY RESOURCES

- Potential to alter topographic features of the landscape.

1.6.3 SOIL RESOURCES

- Potential for soil loss through erosion.

1.6.4 WATER RESOURCES

- Potential to effect surface or ground water quality.

1.6.5 BIOLOGICAL RESOURCES

- Potential to effect special status species or other sensitive wildlife or botanical species.

1.6.6 CULTURAL RESOURCES

- There are sensitive cultural resources near the project area that must be avoided. Also, if additional cultural resources are discovered, these must be protected as appropriate based on consultation with the NM State Historic Preservation Officer (SHPO).

1.6.7 VISUAL RESOURCES

- Blowing dust from the RMM impacts visual resources in the area and must be mitigated appropriately to reduce dust emissions from the proposed BLM parcels.
- Methods should be employed to reduce high contrast features relative to the surrounding landscape.

1.6.8 AIR QUALITY

- Open and disturbed lands and stockpiles on the proposed BLM parcels must be limited and controlled where feasible in order to reduce fugitive dust emissions that impact air quality.

1.6.9 NOISE

- Potential for intrusive noise levels from mine operations.

1.6.10 TRAFFIC

- Potential to change traffic patterns associated with mine operations.

1.6.11 FORESTRY RESOURCES

- Potential loss of fuel wood resources.

1.6.12 HUMAN HEALTH AND SAFETY

- Potential to create conditions hazardous to the public and mine employees.

2.0 DESCRIPTION OF ALTERNATIVES

2.1 ALTERNATIVE A: PROPOSED ACTION (380.5 ACRES)

2.1.1 BACKGROUND

Location: The existing RMM occupies ≈141 acres of land within a 193 acre parcel of CRM owned land located in Section 33, T. 21 N., R. 7 E., Rio Arriba County, NM and comprises all of CRM's ownership including Lots 7, 10, 12, 14, 15, 16, 26, and 29. The CRM land is bounded by Santa Clara Indian Reservation land to the south and BLM lands to the southwest, west, north, and east (Figure 2).

Access: Access to the RMM from U.S. Highway 84/285 would not change. No upgrades would be implemented to the ≈5.5 mile stretch of 31-Mile Road to the RMM property or proposed extension lands. Approximately 1,000 feet east of CRM lands on 31-Mile Road, a 25-foot-wide unimproved dirt access road heads southwest approximately 1,400 feet across the BLM-East parcel until it reaches the eastern boundary of CRM property (Figure 2). This 1,400-foot stretch of dirt access road is currently in trespass, and has been for over 40 years, well before CRM took ownership. Lawful access to the RMM would be obtained as part of this EA. In the meantime, the current access road would remain the only means of ingress and egress from the RMM active pit. However, under the Proposed Action, two new access roads and a series of haul roads would be required. The access roads would be located at the eastern side of the BLM-East parcel along 31-Mile Road and would provide ingress/egress from the BLM-East parcel both

north and south of 31-Mile Road. All necessary rights-of-way would be applied for and permitted prior to mine progression onto BLM lands.

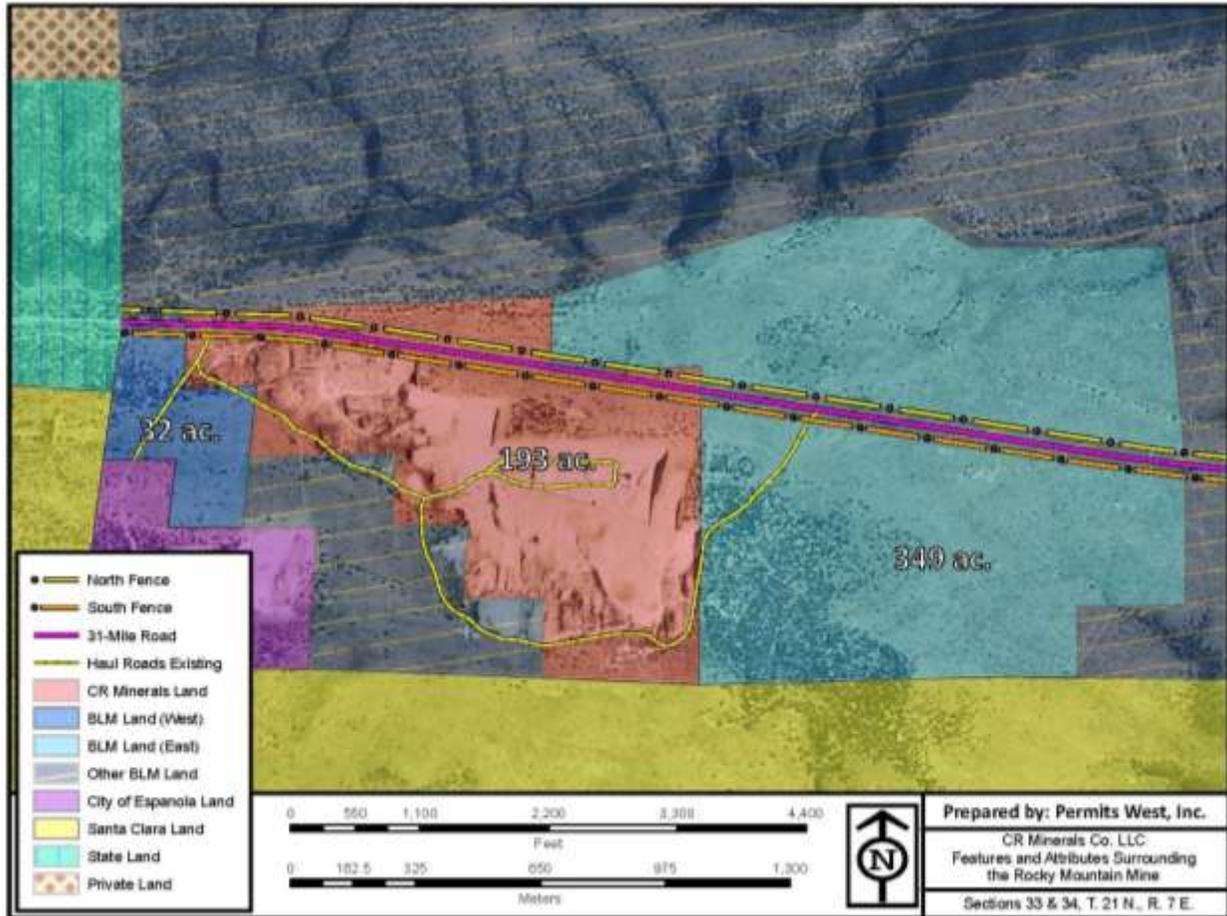


Figure 2. Location and access to existing RMM and CRM property.

2.1.2 MINING SEQUENCE & TIMING

Mining sequence and timing would be largely driven by market conditions. Figure 3 displays all mining blocks on the 2 potential BLM parcels. All permitted BLM lands would be fenced along the 31-Mile Road corridor with appropriate fencing and have intervisible cautionary signage installed to control access to the active mining area. All access roads that breach the north or south fences along 31-Mile Road would have a locking steel gate or other approved access management device installed with appropriate cautionary signage to control access.

2.1.3 MINE CONTINUATION

Two parcels of BLM land are proposed by CRM for future mining (Figure 3). No operational expansion is being proposed. The first parcel, named BLM-West, would be mined for aggregate grade pumice only. The BLM-West parcel is ≈32 acres in size and is located west of the current RMM. The second parcel is named BLM-East and is ≈349 acres in size located east of the current RMM. The BLM-East parcel would be mined for both aggregate and mill grade pumice.

Under the Proposed Action, the BLM-East parcel has six (6) mining phases. They are Phase 1: Blocks E1-E3, Phase 2: Blocks E4-E6, Phase 3: Blocks E7-E9, Phase 4: Blocks E10-E12, Phase 5: Blocks E13-

E15, and Phase 6: Blocks E16-E18. The BLM-West parcel only has one (1) phase referred to as the West Phase: Blocks W1-W3 (Figure 3).

Under the Proposed Action, CRM would relocate the screening plant and active mine face to a location on CRM land near the northwest corner of Block E1 on the BLM-East parcel (Figure 3). If required, aggregate grade pumice material extracted from the BLM-West parcel may either be hauled to the site of the screening plant, or a portable screening plant may be purchased or rented and placed on the BLM-West parcel for processing aggregate grade pumice material closer to its source.

2.1.3.1 BLM-East Parcel (~349 acres)

Mining sequence and timing operations on the BLM-East parcel would progress in 6 total phases illustrated in Figure 4 as Phase 1: Mining Blocks E1-E3, Phase 2: E4-E6, Phase 3: E7-E9, Phase 4: E10-E12, Phase 5: E13-E15, and Phase 6: E16-E18. Based on estimates, each of these mining blocks represents approximately 1½ -2 year of pumice reserve at current production rates. Each of the mining blocks on the BLM-East parcel would be mined in sequence from E1 to E18.

The current operational footprint CRM requires for the screening plant, stockpiles, and safe working area along the active mine face is ≈10 acres. Mining blocks that have been generated differ in size and shape. Mining block sizes were arrived at by taking into account the operational footprint requirement (≈10 acres) of the mine, the volume and grade of ore estimated to be present at a given location, acreage needs to safely strip and handle overburden (up to 45+ feet thick) in a given mining area, and standoff distance for successful reclamation and revegetation. As a result, mining blocks vary in size from 7.73 acres to 19.78 acres. Table 1 provides the acreage of each mining block in the BLM-East parcel under the Proposed Action.

Table 1. Acreages of BLM mining blocks on the BLM-East parcel.

Acreages of BLM (East) Mining Blocks and Phases 1-6		
Phase	Mining Blocks	Acres
1	E1	12.91
	E2	14.80
	E3	14.02
Total acreage of Phase 1		41.73
2	E4	17.53
	E5	19.78
	E6	14.17
Total acreage of Phase 2		51.48
3	E7	12.40
	E8	12.48
	E9	13.36
Total acreage of Phase 3		38.24
4	E10	18.45
	E11	12.75
	E12	14.65
Total acreage of Phase 4		45.85
5	E13	8.37
	E14	9.54
	E15	10.06
Total acreage of Phase 5		27.97
6	E16	10.26
	E17	8.40
	E18	7.73
Total acreage of Phase 6		26.39
Total Acreage of BLM (East) Mining Blocks		231.66

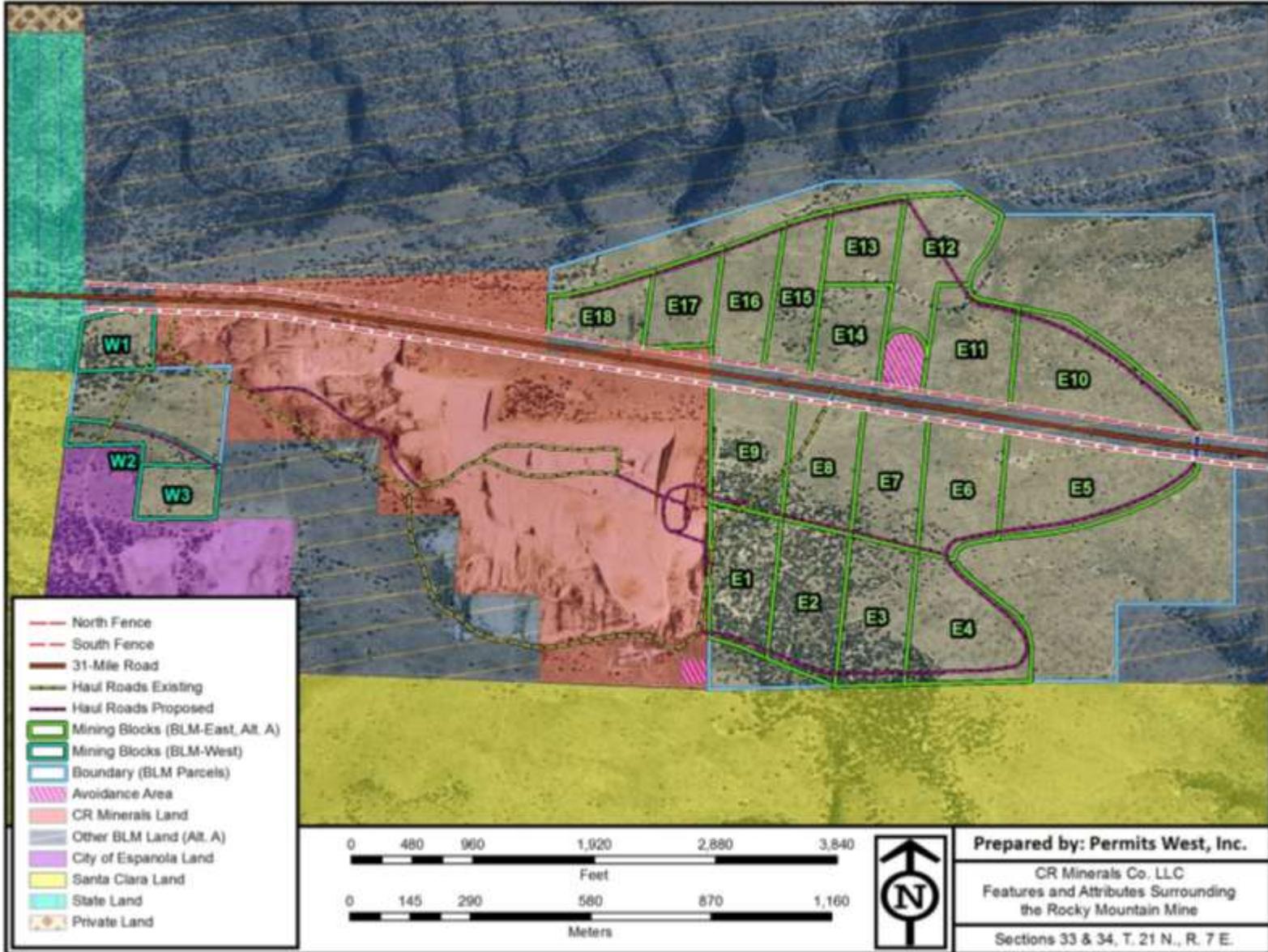


Figure 3. Land Ownership and BLM parcels proposed under the Proposed Action.



Figure 4. BLM-East parcel mining phases, blocks, stockpiles, and overburden movement directions under the Proposed Action.

Phase 1: Blocks E1-E3

During the initial operations of Phase 1 mining, CRM would submit two (2) applications named “Application to Cross/Cut/Install Public Right Of Way Pursuant to Rio Arriba County Ordinance No. 1996-09” (County ROW Permit) for two (2) separate rights-of-way (ROWs) onto Phase 2, Block E5 land, and Phase 3, Block E8 land (current RMM access road). The first ROW would head south from 31-Mile Road to Block E5 (Figure 4). The second ROW would head southwest along the existing RMM access road to Block E8. Both ROWs would be approximately 50 feet wide and 75 feet long. CRM would install locking gates or other approved access management devices at both south fence ROWs in order to control access to mining properties south of 31-Mile Road. A third ROW permit for access to lands north of 31-Mile Road would be required for Phase 4 mining and is discussed at the end of the Phase 3 discussion.

Although CRM would require three (3) County ROW Permits to access the BLM-East parcel (1 north and 2 south of 31-Mile Road), only the south County ROWs Permits would be obtained under Phases 1-3 operations. CRM would also build a new proposed access road along the southern boundary of Blocks E1-E6 (Figure 4). This proposed haul road would provide direct access to Phases 1-2 lands. The haul road at the southern boundary of Phase 3 lands would not be installed until the active mine face reaches this area. All proposed new haul roads would be located entirely within mining block areas other than the access ROWs and roads on CRM land.

Under Phase 1 mining, the active mine face would be directed onto BLM-East lands at the northwest corner of Block E1 (Figure 4). Mining would generally progress eastward through Blocks E1-E4. Approximately the top 9 inches of topsoil would be scraped and discreetly stockpiled above grade on CRM land west of Phase 1 lands and interim seeded with a BLM approved certified weed-free seed mix. The locations of topsoil stockpiles are illustrated in Figure 4. All above grade pumice, topsoil, and overburden stockpiles would include the installation of either an interim seeded containment berm, straw bales and/or geotextile fencing, or other accepted Best Management Practice (BMP) around the downhill side of the piles to prevent the off-site migration of material.

Overburden from Block E1 would be moved northwest, west, or south and stockpiled as illustrated in Figure 4. All BLM overburden stored on CRM land would be kept separate from CRM overburden for the duration of its storage. This BLM overburden would also be interim seeded with a BLM approved certified weed-free seed mix. Prior to stockpiling BLM overburden from Block E1, if necessary, CRM would flatten and smooth all areas on CRM land that would receive Block E1 overburden. The E1 overburden stockpiles located on CRM land west of Block E9 (Figure 4) would sit on top of the current active mine floor. CRM leaves ≈18-30 inches of the bottom of the Guaje pumice formation in place to prevent contact with a cobbly geologic unit below. No additional segregation would be required for this stockpile. The E1 overburden stockpile located immediately west of Block E1 on CRM land would be placed directly on top of CRM overburden. As such, this stockpile would have geo-textile segregation installed. Geotextile segregation involves placing geotextile fabric on the leveled and smoothed footprint prior to stockpiling overburden. The geotextile would be at least 3 feet wide and would be installed every 50-75 feet running both north-south and east-west. The E1 overburden stockpile located south of Block E1 on BLM-East land (Figure 4) would be placed above grade outside of an active mining block.

Initially, overburden would be used to construct necessary safety berms to meet Mine Safety and Health Administration (MSHA) regulatory requirements. No interim seeding would be conducted on MSHA berms because they would be removed too quickly to realize the benefits of interim seeding. All stockpiled overburden from Block E1 would be used later during reclamation activities and contouring in Block E9. Waste overburden movement directions are displayed as blue arrows in Figure 4. CRM may decide to strip overburden in one or more campaigns per mining block.

All pumice ore would be excavated, processed, and sold. Pumice material not initially sold would be stockpiled on CRM land, stockpiled in the active pit, or stockpiled on BLM land as illustrated in Figure 4.

It is also quite possible that some of the pumice material removed would be byproduct sizes that would not be resold. In this case, CRM would use this material during reclamation activities. This initial mine progression would open up a working footprint in the northern half of Mining Block E1 enabling CRM to move mining equipment onto the BLM-East parcel. Once the north half of Block E1 is mined out, the active face would be directed southward to the southern boundary of Block E1.

Then, depending on the location of mining equipment, the active mine face would be directed into Block E2 somewhere along the western boundary of Block E2. Overburden from Block E2 would be moved northwesterly and placed in the mined out Block E1 pit (Figure 4). Mining of subsequent blocks under Phase 1 would continue in the same manner as described for Blocks E1 and E2 with all waste overburden being moved as indicated by the blue arrows in Figure 4.

Reclamation of Phase 1 mining blocks would begin at Block E1 and proceed east through Block E3. The rate of reclamation would entirely depend on the rate of mining. All mining equipment would follow the active mine face and would not reenter preceding mining blocks except for navigation of the proposed haul roads. No more than three (3) mining blocks would be opened up at a given time during any phase (Phases 1-6) of mining operations under the Proposed Action. This means that once mining of Block E3 is completed, reclamation activities occurring in Block E1 would need to be finished before progressing into Phase 2, Block E4 (Figure 4).

Mining blocks differ in size. As a result, the total acreage of open lands at a given progress point would vary based on which 3 mining blocks are open at that time. The acreage open at any given time would vary from ≈ 51.5 acres under Phase 2 (Blocks E4-E6), to ≈ 26.5 acres under Phase 6 (Blocks E16-E18). See Table 1 for acreages of all mining blocks on the BLM-East parcel.

Once mining in Block E3 has commenced, final reclamation of Block E1 would be initiated. Upon completion of final reclamation of Block E1, Phase 2 mining operations would be initiated by CRM. It is important to note that although Phase 2 operations would commence, Phase 1 operations would continue until all Phase 1 lands have been entirely reclaimed.

Phase 2: Blocks E4-E6

During the initial operations of Phase 2 mining, the active mine face would be directed east into Block E4 (Figure 4). Approximately the top 9 inches of topsoil would be scraped and discreetly stockpiled above grade east of Phase 2 lands and interim seeded. The locations of topsoil stockpiles to be used during Phases 1-3 mining are shown in Figure 4. All above grade pumice, topsoil, and overburden stockpiles would include the installation of either an interim seeded containment berm, straw bales and/or geotextile fencing, or other accepted Best Management Practice (BMP) around the downhill side of the piles to prevent the off-site migration of material. Then, overburden from Block E4 would be moved westerly into the Block E3 pit. Initially, overburden would be used to construct necessary berms to meet MSHA regulatory requirements. No interim seeding would be conducted on MSHA berms because they would be removed too quickly to realize the benefits of seeding. Overburden may also be stockpiled below grade in active mining blocks for later use during reclamation. Below grade stockpiles would not be interim seeded or contained. CRM may decide to strip overburden in one or more campaigns per mining block.

All pumice ore would be excavated, processed, and sold. Pumice material not initially sold would be stockpiled on CRM land, in the active pit, or on BLM land as illustrated in Figure 4. If byproduct sizes are generated during mining, it would be used during reclamation activities.

Once Block E4 is mined, the active face would be directed into Block E5 at the south half of the block. Blocks E4 and E5 do not immediately touch. As a result, initial operations in Block E5 would require hauling of overburden back to Block E4 for use. Once an adequate footprint in Block E5 is opened up, CRM would move machinery and equipment into Block E5. Mining of subsequent blocks under Phase 2

would continue in the same manner as described for Blocks E4 and E5 with all waste overburden being moved in the directions indicated by the blue arrows in Figure 4.

Reclamation of Phase 2 mining blocks would begin at Block E4 and proceed north, then west through Blocks E5 and E6. Once all machinery and equipment has been removed from Block E4, CRM would eliminate the proposed haul road along the southern boundary of Phases 1 and 2 lands. The haul road would be ripped and reclaimed as described in the Reclamation and Revegetation Section of this EA. Following reclamation of Block E4, no CRM machinery would reenter Blocks E1-E4.

The rate of reclamation would entirely depend on the rate of mining. All mining equipment would follow the active mine face and would not reenter preceding mining blocks. No more than three (3) mining blocks would be opened at a given time during any phase (Phases 1-6) of operations.

Phase 3: Blocks E7-E9

At the onset of Phase 3 mining, CRM would extend the proposed Phase 3 haul road west to a point in Block E9. All necessary berms to meet MSHA regulations and standards would be installed. This haul road extension would provide ramped access for machinery stripping subsequent higher elevation mining blocks (E8 and E9) as well as provide mine access once the existing access road is mined through.

During the initial operations of Phase 3 mining, the active mine face would be directed west into the south half of Block E7 (Figure 4). Approximately the top 9 inches of topsoil would be scraped and stockpiled above grade east of Phase 2 lands and interim seeded. The locations of topsoil stockpiles to be used during Phase 3 mining are shown in Figure 4. All above grade pumice, topsoil, and overburden stockpiles would include the installation of either an interim seeded containment berm, straw bales and/or geotextile fencing, or other accepted Best Management Practice (BMP) around the downhill side of the piles to prevent the off-site migration of material. Then, overburden from Block E7 would be moved easterly into the Block E6 pit and against the highwall at the south fence. Initially, overburden would be used to construct necessary berms to meet MSHA regulatory requirements. No interim seeding would be conducted on MSHA berms. Overburden may also be stockpiled below grade in active mining blocks for later use during reclamation.

All pumice ore would be excavated, processed, and sold. Pumice material not initially sold would be stockpiled on CRM land, in the active pit, or on BLM land as illustrated in Figure 4. Byproduct sizes produced would be used during reclamation activities. Once the south half of Block E7 is mined, the active face would be directed north to the boundary of Block E7.

Then, the active mine face would be directed into Block E8 at the south half of the block. Overburden from Block E8 would be moved east and placed in the Block E7 pit and against the highwall at the south fence. Once mining in Block E8 is initiated, the current access road would be eliminated. All subsequent access to Phase 3 lands would be from the proposed access/haul road to the east along the south boundary of Blocks E5-E9. Mining of subsequent blocks under Phase 3 would continue in the same manner as described for Blocks E7 and E8 with all waste overburden being moved in the directions indicated by the blue arrows in Figure 4.

Reclamation of Phase 3 mining blocks would begin at Block E7 and proceed west through Block E9. Block E9 would be contoured and filled with overburden stored on CRM and BLM-East lands from Block E1 (Figure 4). Once all machinery and equipment has been removed from Block E9, all haul roads entering the south half of the BLM-East parcel would be eliminated. The roadways would be ripped and reclaimed as described in the Reclamation and Revegetation Section of this EA. Following reclamation of Block E9, no CRM machinery and equipment would re-enter any Phase 1-3 lands (Blocks E1-E9).

The rate of reclamation would entirely depend on the rate of mining. All mining equipment would follow the active mine face and would not re-enter preceding mining blocks unless to navigate the exit haul road.

No more than three (3) mining blocks would be opened at a given time during any phase (Phases 1-6) of operations.

Prior to completion of mining in Block E9, CRM would submit an “Application to Cross/Cut/Install Public Right Of Way Pursuant to Rio Arriba County Ordinance No. 1996-09” (County ROW Permit) for a ROW onto Phase 4, Block E10 lands. The ROW would head north from 31-Mile Road near the eastern boundary of the BLM-East parcel (Figure 4). The ROW would be approximately 50 feet wide and 75 feet long. CRM would install a locking gate or other approved access management device at the north fence to control access to mine lands north of 31-Mile Road.

Once all reclamation activities are completed on Phases 1-3 lands, the two (2) south County ROWs Permits would be relinquished and the gates or other access management devices would be permanently sealed or removed from the south fence. Additionally, the south access roads would be reclaimed using the same techniques and seed mixes described in the Reclamation and Revegetation Section of this EA.

Phase 4: Blocks E10-E12

Phases 4-6 lands would be accessed via a north running ROW from 31-Mile Road to Block E10 (Figure 4). Initially, CRM would be unable to move the screening plant onto Phase 4 lands. First, CRM would strip topsoil and overburden from the eastern half of Block E10. Approximately the top 9 inches of topsoil would be scraped and discreetly stockpiled above grade north of Blocks E10-11 as illustrated in Figure 4 and interim seeded. All above grade pumice, topsoil, and overburden stockpiles would include the installation of either an interim seeded containment berm, straw bales and/or geotextile fencing, or other accepted Best Management Practice (BMP) around the downhill side of the piles to prevent the off-site migration of material. Then, overburden would be used to construct necessary berms to meet MSHA regulatory requirements. No interim seeding would be conducted on MSHA berms. Additional overburden from Block E10 would be stockpiled above grade north of Block E10 as illustrated in Figure 4 and interim seeded.

CRM must also remove the pumice ore in order to establish a new mine floor for the screening plant and associated machinery which would still be located on Phase 3, Block E9. Although minimal drill sampling has been conducted on BLM-East lands, it is believed that much of the eastern half of Block E10 holds aggregate grade reserves only. As a result, CRM would either immediately sell aggregate from Block E10, or stockpile aggregate grade pumice material above grade east of Block E10 as illustrated in Figure 4. Once a new mine floor has been excavated on Phase 4 lands, CRM would relocate the screening plant and associated machinery and equipment from Block E9 (Phase 3) to Block E10 (Phase 4) lands. The screening plant would be moved along the Phase 3 access/haul road in an eastern direction. Then, the plant would be moved across Blocks E6 and E5, then north across 31-Mile Road at the eastern side of the BLM-East parcel at Blocks E5 and E10 (Figure 4).

Once the screening plant and associated equipment are operational on Phase 4 lands, the active mine face would be directed west to the boundary of Block E10 (Figure 4). All pumice ore would be excavated, processed, and sold. Pumice material not initially sold would be stockpiled on CRM land, in the active pit, or on BLM land as illustrated in Figure 4. Byproduct sizes would be used during reclamation activities.

Then, the active mine face would be directed west into Block E11. Overburden from Block E11 would be moved into the E10 pit and placed against the highwall at the north fence or stockpiled below grade. Overburden stockpiled below grade would not be contained or interim seeded. Mining of subsequent blocks under Phase 4 would continue in the same manner as described for Blocks E10 and E11. All waste overburden would be moved in the directions indicated by the blue arrows in Figure 4.

Sitting adjacent to Blocks E11, E12, and E14 is an avoidance area (Figure 4). Currently, CRM lacks sufficient baseline data in this area. As a result, CRM does not currently intend to mine within the

avoidance area. However in the future, CRM may decide to perform the required additional data collection allowing for mining through the avoidance area shown in Figure 4.

Reclamation of Phase 4 mining blocks would begin at Block E10 and proceed west through Block E12. The above grade stockpiled overburden from Block E10 would be used to contour and reclaim blocks E10 and E11. The proposed haul road at the northern boundary of Phases 4-6 lands would not be reclaimed until all Phases 4-6 mining has been completed, all equipment and machinery has been removed, and final reclamation of Block E18 is complete. Only then would this haul road be ripped and reclaimed along its entire alignment from Block E18 to Block E10.

The rate of reclamation would entirely depend on the rate of mining. All mining equipment would follow the active mine face and would not reenter preceding mining blocks except to travel the exit haul road through Blocks E18-E10. No more than three (3) mining blocks would be opened at any given time during any phase (Phases 1-6) of operations.

Phase 5: Blocks E13-E15

During the initial operations of Phase 5, the active mine face would be directed west into Block E13 (Figure 4). Approximately the top 9 inches of topsoil would be scraped and discreetly stockpiled above grade north of Blocks E10-11 as illustrated in Figure 4 and interim seeded. All above grade pumice, topsoil, and overburden stockpiles would include the installation of either an interim seeded containment berm, straw bales and/or geotextile fencing, or other accepted Best Management Practice (BMP) around the downhill side of the piles to prevent the off-site migration of material. Then, overburden from Block E13 would be relocated east into the Block E12 pit as illustrated in Figure 4. Initially, overburden would be used to construct necessary berms to meet MSHA regulatory requirements. No interim seeding would be conducted on MSHA berms. Then, the active mine face would be directed west to the boundary of Block E13 (Figure 4).

All pumice ore would be excavated, processed, and sold. Pumice material not initially sold would either be stockpiled on CRM land, in the active pit, or on BLM land as illustrated in Figure 4. Byproduct sizes generated would be used during reclamation activities.

Once Block E13 is mined out, the active mine face would be directed south into Block E14. Overburden from Block E14 would be moved north and northeast into Blocks E13 and E12 (Figure 4). Mining of subsequent blocks under Phase 5 would continue in the same manner as described for Blocks E13 and E14. All waste overburden would be moved in the directions indicated by the blue arrows in Figure 4.

Reclamation of Phase 5 mining blocks would begin at Block E10 and proceed west through Block E12. The proposed haul road at the northern boundary of Phases 4-6 lands would not be reclaimed until all Phases 4-6 mining has been completed. The rate of reclamation would entirely depend on the rate of mining. All mining equipment would follow the active mine face and would not reenter preceding mining blocks except to travel the exit haul road through Blocks E18-E10. No more than three (3) mining blocks would be left open at any given time during any phase (Phases 1-6) of operations.

Phase 6: Blocks E16-E18

During the initial operations of Phase 6, the active mine face would be directed west into Block E16 (Figure 4). Approximately the top 9 inches of topsoil would be scraped and discreetly stockpiled above grade north of Blocks E10-11 as illustrated in Figure 4 and interim seeded. All above grade pumice, topsoil, and overburden stockpiles would include the installation of either an interim seeded containment berm, straw bales and/or geotextile fencing, or other accepted Best Management Practice (BMP) around the downhill side of the piles to prevent the off-site migration of material. Then, overburden from Block E16 would be moved east into the Block E15 pit or north into an above grade stockpile as illustrated in Figure 4. Initially, overburden would be used to construct necessary berms to meet MSHA regulatory

requirements. No interim seeding would be conducted on required MSHA berms. Once overburden is removed, the active mine face would be directed west to the boundary of Block E16 (Figure 4).

All pumice ore would be excavated, processed, and sold. Pumice material not initially sold would either be stockpiled on CRM land, in the active pit, or on BLM land as illustrated in Figure 4. Byproduct sizes generated would be used during reclamation activities.

Once Block E16 is mined out, the active mine face would be directed west into Block E17. Overburden from Block E17 would be moved northwest and stockpiled above grade, or moved southeast into Block E16 (Figure 4).

Mining of subsequent blocks under Phase 6 would continue in the same manner as described for Blocks E16 and E17. All waste overburden would be moved in the directions indicated by the blue arrows in Figure 4. Once Block E18 is mined out, reclamation would be performed using overburden stockpiled above grade north of Blocks E17 and E18 (Figure 4).

Reclamation of Phase 6 mining blocks would begin at Block E16 and proceed west through Block E18. The proposed haul road at the northern boundary of Phases 4-6 lands would not be reclaimed until all Phases 4-6 mining has been completed. The rate of reclamation would entirely depend on the rate of mining. All mining equipment would follow the active mine face and would not reenter preceding mining blocks except to travel the exit haul road through Blocks E18-E10 for final equipment removal.

2.1.3.2 BLM-West Parcel (~32 acres)

The BLM-West parcel is ~32 acres in size (Figure 5). CRM would consume all material extracted on the BLM-West parcel as aggregate grade only. Mining sequence and timing operations on the proposed BLM-West parcel (West Phase) would progress on an as needed basis. This means that the timeline of mining activities occurring on any of the three BLM-West mining blocks (W1-W3) would not be directly tied to any phase of mining occurring on the BLM-East parcel. All three BLM-West mining blocks (W1-W3) are part of West Phase operations (Figure 5). Conditions influencing the timing of extraction of pumice from West Phase mining blocks include availability and proximity of mining equipment and personnel to West Phase mining blocks, mining efficiency, workload management, aggregate customer demands, and aggregate stockpile assurance. The configuration of mining blocks on the BLM-West parcel, stockpiles of topsoil, overburden, and pumice, as well as waste movement directional arrows (in blue) are illustrated in Figure 5. Table 2 provides the acreage of each mining block in the BLM-West parcel.

Table 2. Acreages of BLM mining blocks on the BLM-West parcel.

Acreages of Blocks on BLM (West) Parcel	
Mining Blocks	Acres
W1	6.05
W2	4.57
W3	6.04
Total Acreage of BLM (West) Mining Blocks	16.66

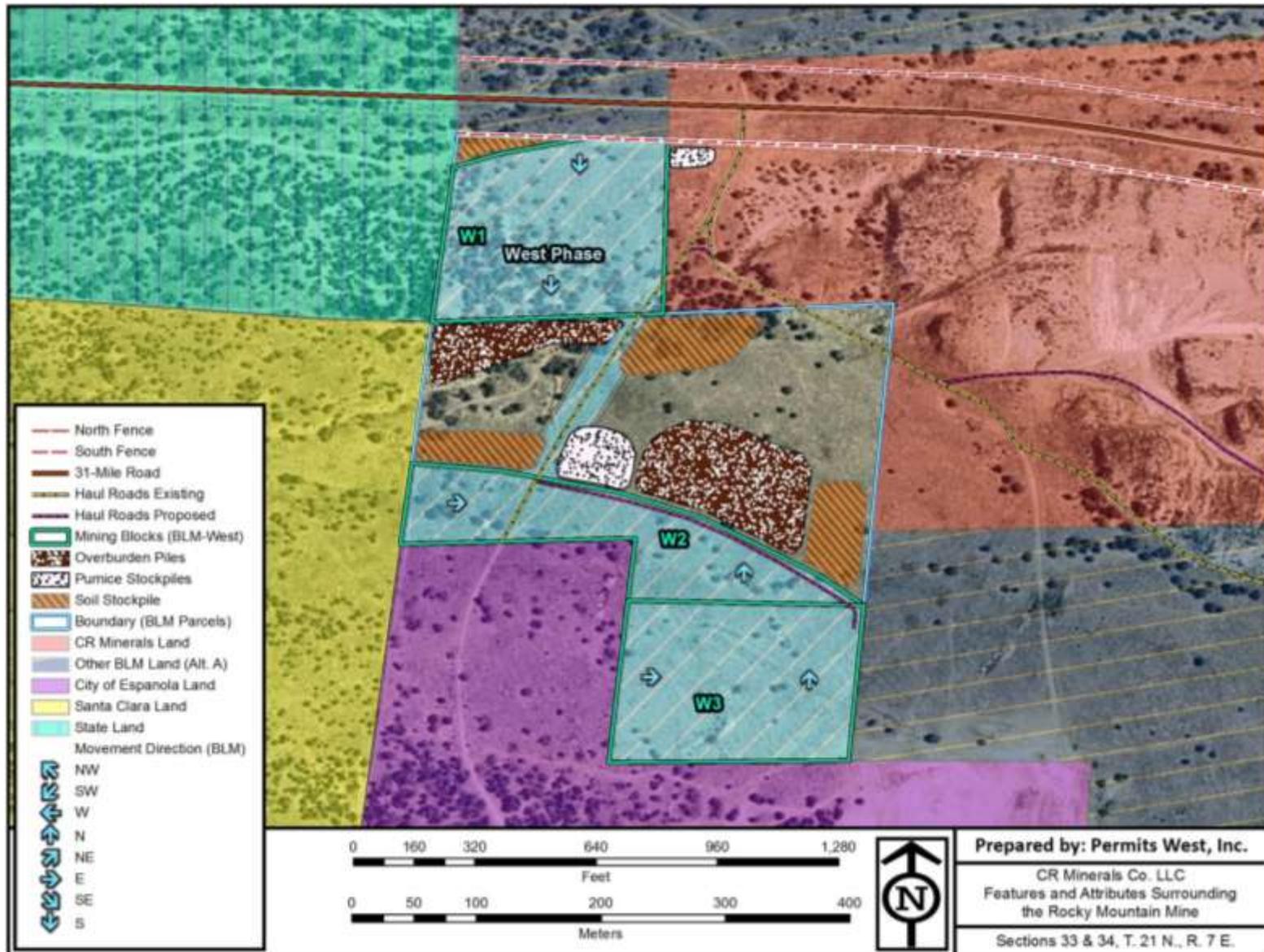


Figure 5. BLM-West parcel mining phases, blocks, stockpiles, and overburden movement directions under the Proposed Action.

West Phase: Blocks W1-W3

CRM intends to enter Block W1 first from the southeast corner at the existing roadway. All West Phase lands would only be mined as aggregate grade. Access from 31-Mile Road to the BLM-West parcel would be achieved through CRM land near the western boundary of CRM land. Currently, there is a steel gate at the south fence in this location which controls access onto CRM property. Once on CRM land (Figure 5), the existing haul road running southwest would be utilized to access Block W1. This haul road would also be used to access Blocks W2 and W3.

During the initial operations on the BLM-West parcel, the active mine face would be directed west from the southeast corner of Block W1. Approximately the top 9 inches of topsoil would be scraped and discreetly stockpiled above grade north of Block W1 as illustrated in Figure 5 and interim seeded. All above grade pumice, topsoil, and overburden stockpiles would include the installation of either an interim seeded containment berm, straw bales and/or geotextile fencing, or other accepted Best Management Practice (BMP) around the downhill side of the piles to prevent the off-site migration of material. Then, overburden from Block W1 would be moved south and stockpiled above grade for later use during reclamation. Initially, overburden would be used to construct necessary berms to meet MSHA regulatory requirements. No interim seeding would be conducted on MSHA berms. All above grade topsoil and overburden stockpiles would be interim seeded. Waste overburden movement directions are displayed as blue arrows in Figure 5.

All pumice ore would be excavated, processed, and sold. Pumice material not initially sold would be stockpiled at the two locations as illustrated in Figure 5. Byproduct sizes generated would be used for reclamation.

Once on the BLM-West parcel, CRM may decide to move the screening plant adjacent to the active mine face. Alternately, CRM may decide to purchase or rent a separate portable screening plant for the West Phase mining blocks. However, CRM may also decide to truck extracted pumice ore to the site of the screening plant if additional processing is required. The location of the screening plant would regularly change as mining progresses and the specific location of the plant would vary. The active mine face within Block W1 would proceed west to the western boundary of Block W1 (Figure 5).

Because Blocks W2 and W3 are immediately adjacent to the City of Española property, a simple fence would be constructed along this private property boundary in order to highlight the boundary location so that mining personnel are readily aware of this property line. All land clearing, soil scraping, overburden movement, and pumice mining efforts along any mining block boundary would be conducted by back dragging from the boundary back onto the operational property.

Initially, CRM would use the existing road to access Block W2. Then, a new haul road would be constructed along the northern boundary of Block W2 (Figure 5). Stripping and mining in W2 would be initiated at a point along the northern boundary and active mining would proceed south to the boundary of Block W2. Overburden would be relocated and stockpiled above grade north of Block W2 as illustrated in Figure 5. Above grade overburden stockpiles would be interim seeded.

Currently, there are no fences marking the property boundary of the City of Española land south of Blocks W2 and W3. Along the City of Española property boundary, CRM would back drag to excavate material. Following removal of ore, overburden would be placed against the highwall to reduce the slope to no steeper than 1 vertical to 3 horizontal (1V:3H) and smooth the transition between West Phase mining blocks and the City of Española land.

Once W2 is mined out, CRM would direct the active mine face into Block W3 at the north boundary. The mine face would then proceed south to the southern boundary of Block W3. All overburden would be either stockpiled above grade or used in contouring and reclamation of Block W2. Overburden stockpiled above grade outside active mining blocks, would be interim seeded. All above grade pumice, topsoil, and overburden stockpiles would include the installation of either an interim seeded containment berm, straw

bales and/or geotextile fencing, or other accepted Best Management Practice (BMP) around the downhill side of the piles. Once mining is completed in Block W3, the stockpiled overburden would be moved back south against the highwall along the City of Española property boundary in Block W2 (Figure 5).

Reclamation of BLM-West mining blocks would begin at Block W1 and proceed to Blocks W2 and W3. The rate of reclamation would entirely depend on the rate of mining. All mining equipment would follow the active mine face and would not reenter preceding mining blocks except to travel the existing exit haul road upon final equipment relocation onto CRM land.

No more than two (2) mining blocks would be opened at any given time during West Phase mining operations. This means that once mining of Block W2 is completed, reclamation activities occurring in Block W1 would need to be completed before progressing into Block W3.

2.1.3.3 All BLM Phases (Phases 1-6 and West Phase) under the Proposed Action

Table 3 provides acreages of all BLM phases for both the BLM-East and BLM-West parcels.

Table 3. Acreages of all BLM-East and BLM-West Phases.

Acreages of All BLM Phases		
Phase	Mining Blocks	Acres
West	W1-W3	16.66
1	E1-E3	41.73
2	E4-E6	51.48
3	E7-E9	38.24
4	E10-E12	45.85
5	E13-E15	27.97
6	E16-E18	26.39
Total acreage of All Phases (East & West)		248.32

The total acreage of all stockpiles outside of mining blocks on the BLM-East parcel is \approx 59.1 acres. The total acreage of all stockpiles outside of mining blocks on the BLM-West parcel is \approx 6.6 acres. All areas used for stockpiling would be reclaimed and seeded. Under the Proposed Action, the total Direct Impact Area (DIA) for all footprints of haul roads, mining blocks, and stockpiles is \approx 326 acres (DIA on BLM-West = 23.97 acres, DIA on BLM-East = 302 acres).

2.1.4 OTHER RELEVANT DETAILS OF THE PROPOSED ACTION

2.1.4.1 Mining Methods and Equipment

Approximately nine (9) inches of topsoil would be stripped by wheel tractor scrapers or excavator and truck and stockpiled above grade and interim seeded. All topsoil would be broadcast seeded with the interim seed mix composed of at least four (4) native forbs, five (5) native grasses, and ¹Regreen™. All above grade pumice, topsoil, and overburden stockpiles would include the installation of either an interim seeded containment berm, straw bales and/or geotextile fencing, or other accepted Best Management Practice (BMP) around the downhill side of the piles to prevent the off-site migration of material.

Overburden would be excavated by a bulldozer, scraper, or excavator and truck and used for MSHA berm construction, containment berm construction, and reclamation contouring in the previously mined areas. Excess overburden would be stockpiled above or below grade separate from topsoil stockpiles. Stored overburden would be used for later reclamation contouring and slope reduction. Initially, overburden may be used to reduce slopes of existing highwall areas. When conditions allow, overburden would be

¹ Regreen™ is a sterile wheat/wheatgrass (*Triticum aestivum/Elytrigia elongata*) hybrid. Regreen™ has a dense, fibrous root system that stabilizes soil surfaces but also has deep roots conferring drought tolerance, winter hardiness, and adaptability to varying soil/moisture conditions.

stockpiled below grade in the pit rather than above grade. In the event overburden must be stockpiled above grade, piles would not exceed 10 feet in height and would be interim seeded.

Pumice would be ripped with a bulldozer and pushed to temporary piles near the in-feed side of the portable screening plant. A front end loader would then load the mine run pumice material directly into the screening plant. As excavation of the active mine face moves away from the screening plant, the screening plant, 100 kW diesel generator, and portable diesel fuel tank would be relocated closer to the mine face to reduce circuit distance of the bulldozer pushing the ore. Material would then be conveyed from the screening plant through a sorter into 8 piles of product ready for sale or milling. CRM currently produces 8 sizes; however, future market conditions and customer demands may require additional sizes to be sorted. In this case, CRM would stockpile additional discreet piles depending on market demands.

Equipment refueling and the storage and use of any hazardous chemicals or materials would be conducted on CRM land. No fuels or hazardous materials would be stored on BLM land other than the portable diesel fuel tank used for power generation. A liner would be installed beneath the fuel storage tank to contain spills. Lubricants, cleaners, or any other potentially hazardous materials necessary to maintain the screening plant would be stored on CRM land, but used at times on BLM land during maintenance or repair of the screening plant.

As demand requires, CRM would use various equipment to accomplish mining at the RMM. CRM may decide to bring additional machinery to the RMM in order to meet demands or generate products with specifications that meet customer needs. At times, CRM may rent or purchase an additional screen to enable specialized sorting. Any additional machinery needs would be addressed as needed and would scale according to market demands. This means that CRM may have more than one of any piece of equipment in order to supply pumice products to customers in a timely fashion. Also, CRM may at times bring in outside contractors for earthmoving or screening.

Typical machinery, vehicles, and equipment that would be used at the RMM are provided in Table 4.

Table 4. Vehicles, machinery, and equipment currently used at the RMM.

Vehicles, Machinery, and Equipment Currently Used		
Bulldozer(s)	Portable Screening Plant(s)	Wheel tractor scraper(s)
Front end loader(s)	Crusher(s)	Conveyors
Fuels and lubes truck	Dump truck(s)	Pickup trucks
Portable Diesel Fuel Tank	Diesel generator	Motor Grader(s)

2.1.4.2 Reserves

Current reserves available for consumption at the RMM are limited. Reserves estimates have been calculated for the BLM-East parcel only using widely dispersed drill holes requiring substantial inference between sampling points. As such, reserves estimates are inexact but are typically within 15-20% of actual volumes. No drill sampling has been performed on the BLM-West parcel.

Under the Proposed Action, estimates of reserves on BLM-East would continue to be viable for ≈27 years at current levels of production. BLM-West reserves would also provide a volume of aggregate grade pumice, but the exact volume of aggregate reserves on the BLM-West parcel is not known.

2.1.4.3 Slope Stability

Currently, the RMM has several highwalls across the mine site including the active pit area. These highwalls tend to be relatively stable and do not present an extreme hazard. However, caution would be exercised during any mine activities that occur beneath current or future highwall areas. During any mining occurring on BLM parcels, slopes of highwalls would be regularly reduced using overburden from adjacent mining blocks.

2.1.4.4 Stockpile Stability

Slopes of stockpiles would be no steeper than 1 to 1. This applies to topsoil, overburden, unprocessed material, and all marketable products (e.g., plant grade and aggregate grade pumice), and all unmarketable material. All above grade pumice, topsoil, and overburden stockpiles would include the installation of either an interim seeded containment berm, straw bales and/or geotextile fencing, or other accepted Best Management Practice (BMP) around the downhill side of the piles to prevent the off-site migration of material.

2.1.4.5 Drilling and Blasting

There would be no drilling or blasting as part of the Proposed Action.

2.1.4.6 Interim Erosion & Sediment Control

Erosion and sedimentation would be controlled in the short-term by seeding all above grade topsoil and overburden stockpiles (Figures 4 and 5) with a seed mix consisting of 5 native grasses, 4 native forbs, and Regreen™. All above grade pumice, topsoil, and overburden stockpiles would include the installation of either an interim seeded containment berm, straw bales and/or geotextile fencing, or other accepted Best Management Practice (BMP) around the downhill side of the piles. Runoff into or from active mining areas would be controlled using short-term earthen berms that would be interim seeded. These berms would be installed as necessary at low spots to control stormwater flows from entering or leaving active mining areas and prevent sedimentation to adjacent drainages. Once adjacent mining is completed, temporary berms would be removed and reclaimed and would migrate with active mining.

Under Phase 1 through Phase 3 mining, a highwall would be left along the northern boundary of Blocks E1-E4. There may also be MSHA berms constructed to meet safety regulations. These MSHA berms would not be seeded. Any berms placed around the active pit would generally slope toward the pit interior to form a basin.

Erosion and sedimentation would be controlled in the long-term by contouring slopes to no steeper than 3 (horizontal) to 1 (vertical), spreading overburden, spreading topsoil, ripping compacted areas at least 12 inches deep on the contour, and seeding with a seed mix approved by the BLM, TFO. A proposed seed mix is described in more detail in the Seed Mix Section that follows. All haul roads and other ancillary roads on the BLM parcels would be similarly reclaimed. Ultimately, all disturbed areas would be harrowed and seeded as described in Section 2.1.5 below. Additional detail regarding long-term erosion and sedimentation control, contours and form, and seed mixes is provided in Section 2.1.5 below.

2.1.4.7 Health and Safety

CRM would comply with all Federal health and safety regulations as defined by the Mine Safety and Health Administration (MSHA). Although the RMM may continue to have highwalls, appropriate measures to ensure safety while working or mining beneath highwalls would be undertaken. CRM mine personnel would receive mandatory health and safety training pursuant to 30 CFR Part 48.

2.1.4.8 Forestry

CRM would manage, utilize, and dispose of all BLM administered forestry materials that occupy all Direct Impact Areas (DIAs) in the project area in accordance with all TFO Standard Operating Procedures (SOPs) and guidance.

2.1.4.9 Water Use

CRM does not have a source of water at the RMM property.

There would be no discharge of water from the mine property. A Storm Water Pollution Prevention Plan (SWPPP) has been developed and submitted to the U.S. Environmental Protection Agency (EPA). The current Storm Water Pollution Prevention permit was assigned Permit No. NMR05A560.

2.1.5 RECLAMATION AND REVEGETATION

2.1.5.1 Financial Bonding

Approval of the Proposed Action requires permitting from two agencies, the BLM through this EA, and the New Mexico Mining and Minerals Division (NM MMD) through a New Unit Modification to Permit No. RA004RE. As such, the BLM position defers financial bonding for saleable mineral contracts to the most stringent process for calculating a third party contractor reclamation cost estimate. As such, Financial Assurance (FA) would be calculated by CRM for the Proposed Action using the NM MMD MSExcels model. Results of the reclamation cost estimate modeling would be reviewed and approved by the NM MMD. The NM MMD approved third party reclamation cost estimate would be used as the only FA CRM would be required to post in order to move forward with any future mining.

2.1.5.2 Topsoil

The topsoil would either be used immediately in reclamation activities or be stored in above grade topsoil stockpiles displayed in Figures 4 and 5. The above grade topsoil stockpiles would include installation of either an interim seeded containment berm, straw bales and/or geotextile fencing, or other accepted BMP around the downhill side of piles to prevent off-site migration of material.

All topsoil would be interim seeded and covered with some form of approved organic mulch to prevent loss from erosion and preserve soil fertility until it is used in final reclamation activities. Shrub species are not included in the interim seed mix since they would take too long to establish and their value to a short-term stabilization effort is not cost effective. The topsoil stockpiles would be regularly checked for weed infestations. If a significant weed infestation exists, an eradication effort would be initiated.

2.1.5.3 Contours and Form

Immediate site stabilization earthwork would be carried out in the short-term to limit wind and water erosion. Active highwalls would not necessarily be contoured during active mining operations. However, reclaimed highwalls in any of the mining blocks would slope inward. Once earthwork has been completed, highwalls would slope at no steeper than 3 (horizontal) to 1 (vertical). Compacted areas would be ripped at least 12 inches deep to allow easier root growth and pitting or ripping on the contour would be performed to trap stormwater runoff, deter gullying, and enhance growth. The original contours and drainage patterns would be replicated as much as possible. Figure 6 illustrates the approximate post mining topography along with mining blocks. If necessary, slopes would be stabilized with erosion blankets or any other applicable method using BMPs to reduce the potential for erosion by wind and water. In general, all mine areas would be smoothed and stabilized.

2.1.5.4 Revegetation

In order to promote success of the revegetation effort, all earthmoving work would be performed to include ripping compacted areas at least 12 inches deep to allow easier root growth, pitting or ripping on the contour to trap stormwater runoff and enhance growth, and spreading topsoil evenly. Once seeded, reclaimed areas would be monitored for one year for noxious weeds. If noxious weeds are identified, an eradication effort would be undertaken to ensure that weeds would be treated in accordance with the *Taos Field Office Programmatic Weeds Treatment Plan* (DOI-BLM-NM-F020-2010-0007-EA) completed in June of 2011.

Seeding of the topsoil and overburden stockpiles and final reclamation lands would be performed following one of two seed application options described below. The option to be exercised would depend on conditions and seed availability at the time of interim or post mining reclamation activities. Because the post mining reclamation timeline would progress for a few decades, and because CRM cannot ensure availability of a single species of seed, various other acceptable species are considered suitable to accomplish the intended goals of revegetation.

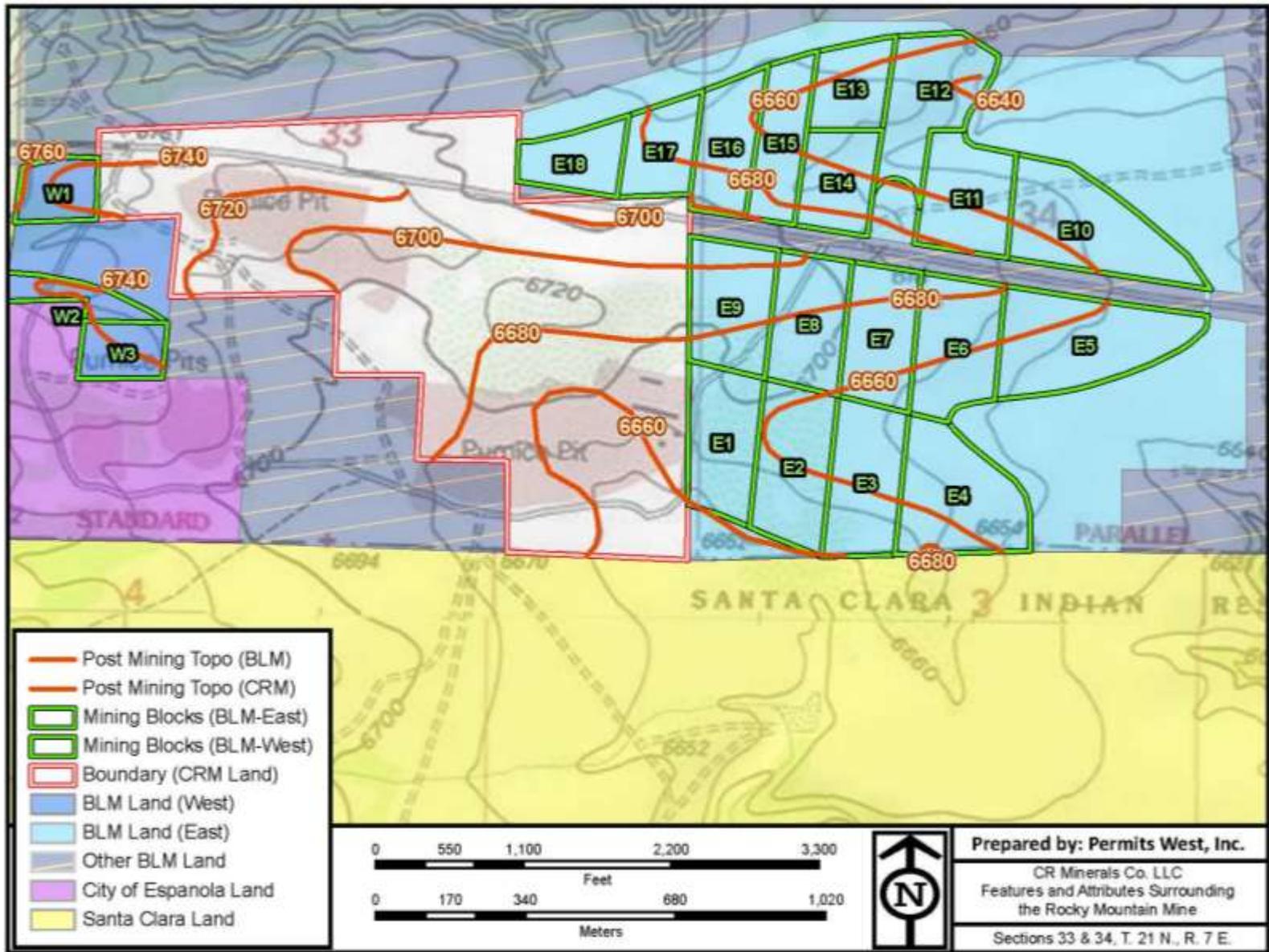


Figure 6. Approximate post mining topography and mining blocks at the Rocky Mountain Mine.

Under the Proposed Action, there are two (2) options that may be used to apply seed during revegetation. All seed will be a certified weed-free seed mix approved by the BLM. The first option of applying seed is ***disc and drill application***. This application involves discing and/or drilling 20 pounds of regional native seed mix (cool and warm weather adapted, 5 grasses, 4 forbs, and 4 shrubs [There would be no shrub seed in the interim seed mix, see Seed Mixes Section below]) and 10 pounds of Regreen™ per acre. Then mulch would be spread to cover bare ground above newly planted seed. The second option of applying seed is ***broadcast and harrow application***. Broadcast and harrow seeding would be applied in areas or patches where the other application option is not desired. Any seeding conducted using the broadcast and harrow method would use a seed mix at a rate of 40 pounds of regional native seed mix (cool and warm weather adapted, minimum of 5 grasses, 4 forbs, and 4 shrubs [There would be no shrub seed in the interim seed mix, see Seed Mixes Section below]) and 20 pounds of Regreen™ per acre.

Goals of the reclamation and revegetation effort are:

1. Stabilize disturbed sites by reducing the potential for soil erosion by wind and water runoff.
2. Re-establish healthy, vigorous ground cover to their original condition or better using native plant species.
3. Establish regenerating and self-supporting native vegetation.

Appropriate documentation detailing the dates of revegetation activity, specific seed mixtures applied, and materials, equipment, and personnel involved in each activity would be kept and maintained so these logs can be referenced in the future. Soil analysis would be undertaken before any fertilizers are applied. Fertilizer is currently not planned unless the topsoil is particularly poor in nutrients.

Mulch would be applied after seeding and is important for preventing water and wind erosion, soil crusting, rainfall impact, thermal insulation, and decreasing evaporation (Munshower 1994). The mulch used would be free from mold, fungi, and noxious weed seeds and spores. Certified noxious-weed free straw and hay would be applied if necessary. Biodegradable material would be used as mulch. Mulch options include native hay, small grain straw, wood fiber, cotton, or jute. Native hay and small grain straw tend to contain seeds of the vegetative material and also tend to attract livestock and wildlife. As such, the use of native hay and/or small grain straw may not be the ideal choice and would be approved by the BLM prior to any application.

Reclaimed areas would not be re-entered after seed application and disturbance would be minimized. The seeded areas would be protected from grazing for at least five years after seeding. If re-seeding is necessary, the length of time the areas are protected from grazing would be extended.

Soil preparation is important. Appropriate surface roughness improves retention of seed, water, and topsoil. Once topsoil is placed, CRM would avoid compacting the soil surface. Also, the total number of passes made by any tillage and/or seeding machinery would be minimized. Habitat niches would be created if possible to create environmental features that promote seed germination and seedling survival. Pitting of the ground surface may be employed to collect litter, seeds, fine dust, and precipitation and act as a refugia from wind for seed germination and seedling establishment (Bainbridge 1997).

Alkali sacaton (*Sporobolus airoides*) is a commonly used species for seeding and stabilizing disturbed lands in the semiarid Southwest (Johnson 2000). Since this species is already present at the project site, every effort would be made to include this species as one of the dominant species in the final reclamation seeding mix.

Black grama (*Bouteloua eriopoda*) is a desirable grass and is often a dominant grass on sandy loam soils such as those at the project site. It forms its own vegetation type and has been considered the climax type of some southwestern rangelands (Simonin 2000). Since it is currently well established at the site every effort would be made to include this species as a significant component in either the interim or final reclamation seed mixes.

CRM would coordinate with the BLM, TFO for site specific guidance to ensure that the appropriate measures are being implemented for reclamation and revegetation.

2.1.5.5 Seed Mixes

There are two proposed certified weed-free seed mixes that would be applied across the RMM site. The first is an interim seed mix for seeding of containment berms, overburden stockpiles, and topsoil stockpiles. The second is a final reclamation seed mix for seeding of all post mining disturbance areas during final reclamation.

The *interim seed mix* would contain at least four (4) species of forbs, five (5) species of grasses, and Regreen™. The *final reclamation seed mix* would contain at least four (4) species of forbs, five (5) species of grasses, four (4) species of shrubs, and Regreen™. Each of the seed mixes would contain certified weed-free seed that is approved by the TFO.

Locally adapted ecotypes and cultivars would be purchased by CRM when available. Other factors that would be taken into consideration for seed selection include availability, ease of establishment, and seedling vigor. If any non-native species have to be added to the mix due to unavailability of natives, they would be annual and sterile (as is the case for Regreen™).

As an enhancement to the native seed plantings or in the event that native seed is unavailable, a cover of sterile non-native species can provide immediate ground cover. At the end of the growing season the litter or stubble would serve to trap moisture and wind-blown seed from the surrounding communities and provide the microsites needed for successful native seed germination and seedling establishment. It is important that these non-natives do not produce viable seed so that there is no chance of permanent establishment. After sterile plants die they do not leave a new generation of seeds behind to compete with native annuals or slower growing native perennial species. As such, CRM proposes to use Regreen™ to fill this need. Regreen™ is a wheat x wheatgrass (*Triticum aestivum x Elytrigia elongata*) hybrid that produces a sterile plant and is often used in revegetation projects (Glen 1992). There are also other varieties of spring wheat (*Triticum aestivum*), oats (*Avena sativa*), and barley (*Hordeum vulgare*) that do not produce viable seed and may also serve as a viable alternative to Regreen™.

Under the Proposed Action, all BLM lands would be seeded using a seed mix that contains all or some of the seed of the species (*Krascheninnikovia lanata*, *Chrysothamnus greenei*, *Bouteloua eriopoda*, *Sporobolus airoides*, *Pleuraphis jamesii*, *Pascopurum smithii*).

In addition to the mix of species outlined above, two more shrub or sub-shrub species, one more grass species, and at least four forb species would be added to the final reclamation seed mix. The shrub species would ideally include *Atriplex canescens* and *Artemisia frigida* if seed can be located. Both species grow naturally at the site. Additional grass species include blue grama (*Bouteloua gracilis*) and/or Indian ricegrass (*Achnatherum hymenoides*) depending upon availability. Forb species would include at least one nitrogen-fixing species such as a species of *Astragalus*, *Vicia*, or *Psoralea*. Ultimately, all species and seed mix ratios would be coordinated and approved by the BLM, TFO.

Table 5 provides species recommendations for seed mixes that would be used to create an acceptable mix and ratio for both the interim seed mix and the final reclamation seed mix.

Table 5. Species proposed for interim and final reclamation seed mixes.

Botanical Name	Common Name
Shrubs and Sub-Shrubs	
<i>Atriplex canescens</i>	Four-wing saltbush
<i>Krascheninnikovia lanata</i>	Winterfat
<i>Chrysothamnus greenei</i>	Greene's rabbitbrush
<i>Rhus trilobata</i>	Oakbrush sumac

Botanical Name	Common Name
<i>Artemisia frigida</i>	Fringed sage
Grasses	
<i>Sporobolus airoides</i>	Alkali sacaton
<i>Sitanion hystrix</i>	Bottlebrush squirrel tail
<i>Achnatherum hymenoides</i>	Indian ricegrass
<i>Pleuraphis jamesii</i>	Galleta
<i>Bouteloua eriopoda</i>	Black grama
<i>Aristida purpurea</i>	Purple threeawn
<i>Pascopyrum smithii</i>	Western Wheat grass
<i>Bouteloua gracilis</i>	Blue grama
<i>Bouteloua curtipendula</i>	Side oats grama
<i>Schizachyrium scoparium</i>	Little bluesteam
<i>Sporobolus cryptandrus</i>	Sand dropseed
Forbs	
<i>Astragalus sp.</i>	Milkvetch
<i>Linum lewisii</i>	Blue flax
<i>Penstemon strictus</i>	Rocky Mountain penstemon
<i>Petalostemum purpurpeum</i>	Purple prairie clover
<i>Mentzelia multiflora</i>	Adonis blazingstar
<i>Sphaeralcea sp.</i>	Globemallow
<i>Pediomelum hypogeum</i>	Indian breadfruit
<i>Verbesina encelioides</i>	Golden crownbeard

2.2 ALTERNATIVE B: NO ACTION (0.0 ACRES)

Alternative B (No Action alternative) assumes that the BLM TFO would deny the application for extension of the RMM and that no future mining operations outside the existing mining area limits on private land would occur. No scraping, excavation, or grading would be undertaken. BLM lands adjacent to the current RMM would receive no future mining activity. Entering into materials sales contracts for sand and gravel is discretionary and the BLM has no obligation to approve either the Proposed Action or any action alternative. Actions of this type are, however, both consistent with current BLM resource plans and meet current planning objectives.

2.3 ALTERNATIVE C: LIMITED TO SOUTH OF 31-MILE ROAD (213.1 ACRES)

Alternative C is the only reasonable alternative to the Proposed Action identified by BLM managers at the May 5, 2011 meeting. Alternative C is considered appropriate to include in this EA based on the current and proposed rate of production at the RMM. Using the proposed mining production rate (similar to current levels), the life of reserves on the entire BLM-East parcel (both north and south of 31-Mile Road) is estimated at ≈ 27 years under the Proposed Action. In order to permit the ≈ 27 years of reserves on the BLM-East parcel, the BLM will be required to make commitments that may exceed the lifespan of the TFO Resource Management Plan (RMP). However, federal agencies regularly execute commitments in decision records for leasing, development, and extraction of finite resources for the duration of the resource. Reserve estimates for the BLM-East parcel south of 31-Mile Road are estimated to last ≈ 16.75 years.

Alternative C is similar in most ways to the Proposed Action in that all operations, progression, reclamation, and timing would occur at the same rate and in the same manner as outlined in the Proposed Action. However, under Alternative C, only lands south of 31-Mile Road would be mined. The land area proposed for Alternative C is limited to the entire BLM-West parcel (31.64 acres) and lands south of 31-Mile Road on the BLM-East parcel (181.48 acres) (Figure 7). Under alternative C, the mine would only progress through Phases 1-3, Mining Blocks E1-E9 on the BLM-East parcel. Also, all ROWs would also be pursued for lands south of 31-Mile Road. On the BLM-West parcel, the West Phase would be completely mined and reclaimed in all three mining blocks (Blocks W1-W3) in the same manner as described in the Proposed Action. The total acreage of BLM land proposed for Alternative C is 213.12 acres. The total Direct Impact Acreage (DIA) under Alternative C is 185.2 acres (DIA on BLM-West = 23.97 acres, DIA on BLM-East = 161.23). No mining would occur on the north side of 31-Mile Road under Alternative C.

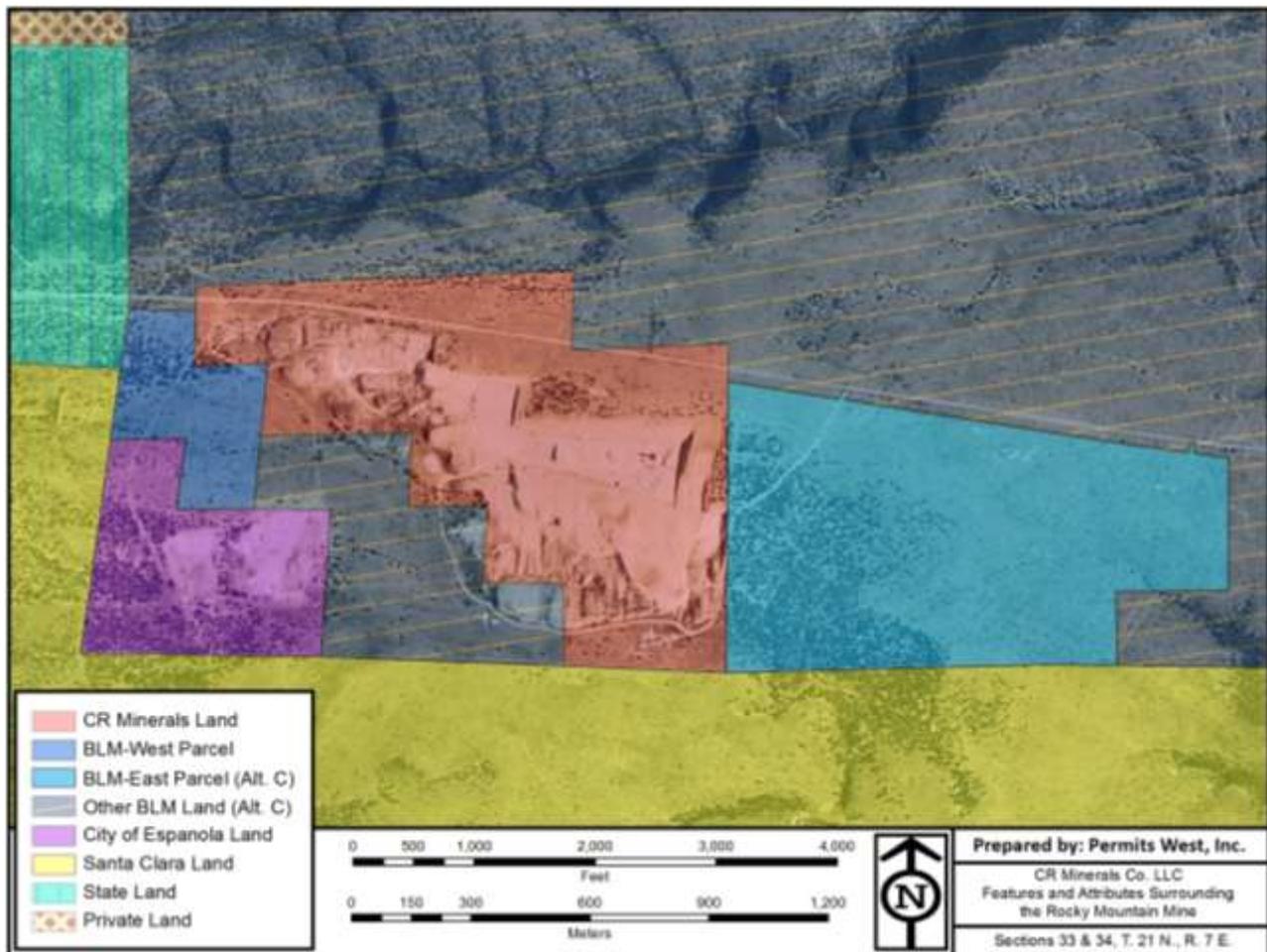


Figure 7. Proposed BLM lands under Alternative C.

2.4 OTHER ALTERNATIVES

No additional alternatives were identified during public and internal BLM scoping.

2.5 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

There were no alternatives considered but eliminated from further detailed analysis.

3.0 AFFECTED ENVIRONMENT

This chapter provides a description of the existing environment by resource type (Sections 1.6 and 1.7). All descriptions are intended to supply the reader with a context of the baseline condition to enable evaluation of effects in Chapter 4, Environmental Consequences.

3.1 LAND TENURE AND USE

Land ownership surrounding the project site is illustrated in Figure 2. Land immediately north of the project area is administered by the TFO. Lands west of the northern portion of the BLM-West parcel are administered by the State of NM. Lands south of the BLM-West parcel are owned by the City of Española. Approximately 2,179 feet north of the BLM-West parcel is the nearest private land not owned by CRM. Lands west, north, and east of the BLM-East parcel are either owned by CRM or administered by the TFO. Finally, all lands south of the BLM-East parcel are owned by the Pueblo of Santa Clara (Figure 2).

The private property northwest of the project area contains the closest permanent receptors to the proposed BLM parcels. The only other receptors in the project area would be those traveling 31-Mile Road through the project area, or those using adjacent BLM lands for undeveloped opportunities and uses. Visitation to lands surrounding the project area is irregular and tends to be elevated on weekends or during special events hosted by the nearby private landowner northwest of the project area. Additionally, motor vehicle passengers traveling through the project area also account for short-term receptors in the area.

Historically, the primary use of BLM lands within and surrounding the project area was for livestock grazing. BLM lands in and surrounding the project area are part of grazing allotment Cerro Negro 537. Currently, the Cerro Negro 537 allotment is not being leased and no cattle are being grazed on this allotment. However, at times, cattle are seen passing through the RMM and surrounding property. These cattle are likely entering the area from downed fencing in an adjacent pasture.

Another land use for BLM lands in the project area is undeveloped recreation opportunities. Opportunities for undeveloped recreation in and near the project area include birdwatching, bicycling, picnicking, rockhounding, photography, hiking, limited hunting, camping, transient OHV use, and drawing and painting. However, few people use the project area and nearby BLM lands for undeveloped recreation opportunities as the surrounding region provides far better opportunities and settings for all types of recreational pursuits.

The current 1988 RMP for the TFO lists lands in the project area for “disposal”.

3.2 GEOLOGY RESOURCES

Surface deposits in the project area consist of fine sand, gravels, cobbles, and pumaceous sand classified as older gravel deposits by the New Mexico State Highway and Transportation Department (Geology and Aggregate Resources Region V). Bandelier Tuff outcrops are present in this area with a small portion of the western side of the City of Española land characterized by the Puye Formation. The Puye Formation consists of sand, gravel, and tuff. The Puye Formation is reported to be about 700 feet thick in the general area (CRM 1999).

Pumice deposit and overburden thicknesses surrounding the RMM vary greatly (overburden up to 45+ feet). Overburden thicknesses tend to be thinner or absent near the edges of the pumice deposit. However, the areas lacking overburden are still overlain by topsoil. In areas lacking overburden, the topsoil has stained and discolored the pumice. As such, these materials are not sent to CRM’s mill and are instead sold as “aggregate grade”.

3.3 SOILS RESOURCES

The existing RMM property and the additional BLM parcels are characterized by three different soils, the Orlie fine sandy loam (# 103), the Espiritu-Wauquie association (# 140), and the Oelop fine sandy loam (#173). A description of each soil is provided below.

3.3.1 SOIL # 103 – ORLIE FINE SANDY LOAM

This soil is characterized by slopes of 1-8 percent at elevations of 6,200-7,500 feet with mean annual precipitation of 13-16 inches. This soil is commonly found on mesas and fan remnants derived from fan alluvium and/or slope alluvium derived from sandstone and shale. This soil is well drained with no frequency of flooding or ponding and has a high available water capacity. The typical profile for the Orlie fine sandy loam is fine sandy loam from 0-3 inches, clay loam from 3-13 inches, and sandy clay loam from 13-60 inches (NRCS 2008).

3.3.2 SOIL #140 – ESPIRITU-WAUQUIE ASSOCIATION

This soil is characterized by slopes of 35-60 percent at elevations of 6,000-7,000 feet with mean precipitation of 13-16 inches. This soil is commonly found on escarpments derived from slope alluvium over colluviums derived from igneous rock. This soil is well drained with no frequency of flooding or ponding and has a low available water capacity. The typical profile for the Espiritu-Wauquie association is very cobbly loam from 0-5 inches, very cobbly clay loam from 5-19 inches, very cobbly sandy clay loam from 19-40 inches, and very cobbly sandy loam from 40-60 inches (NRCS 2008).

3.3.3 SOIL #173 – OELOP FINE SANDY LOAM

This soil is characterized by slopes of 1-5 percent at elevations of 5,900-6,700 feet with mean annual precipitation of 10-13 inches. This soil is commonly found on stream terraces derived from stream alluvium composed of sandstone and shale. This soil is well drained with no frequency of flooding or ponding and has a high available water capacity. The typical profile for the Oelop fine sandy loam is fine sandy loam from 0-5 inches, clay loam from 5-45 inches, and sandy loam from 45-60 inches (NRCS 2008).

3.4 WATER RESOURCES

There are no perennial or intermittent streams immediately surrounding the RMM site. On both CRM land and the two BLM parcels, there are swales; however, none of these carry perennial or intermittent flows. No springs, seeps, or shallow groundwater has been observed on CRM land or the potential BLM parcels. The headwater area of one moderately sized dry drainage (Arroyo del Gaucho) initiates on the proposed BLM parcels and immediately exits both CRM and BLM lands flowing south and then east-northeast. Another larger drainage (Arroyo de la Plaza Larga) initiates farther west and upslope of the RMM and drains east, approximately 550 feet north of the northern boundary of CRM land and both BLM parcels (Figure 3). Also, approximately 1 mile south of the RMM, Santa Clara Canyon drains the eastern slopes of the Jemez Mountains in an east-southeasterly direction.

Average annual precipitation for Española, NM between April 1, 1895 and December 31, 2010 is 9.93 inches with July, August, and September being the wettest months (WRCC 2011). These summer months align with late summer monsoonal activity that drives large thunderstorm development.

The project area is not within a 100-year floodplain or susceptible to flooding.

CRM does not have a well at the project area and no water would be discharged in the project area.

Runoff into the RMM pit is not currently prevented. The soils in the project area have no frequency of flooding and ponding and have a relatively high ability to transmit water. Additionally, the project area is

not characterized by any defined drainages that carry regular pulses of stormwater into the project area, rather most water quickly flows offsite to nearby headwater drainages and arroyos that drain the entire region. Thus, only direct rain or snowfall typically enters the pit. There is minimal precipitation accumulation within the pit since the average annual precipitation for Española is 9.93 inches (WRCC 2011) and a sizeable percentage of the exposed soil within the pit is made up of highly absorbent pumaceous material.

3.5 BIOLOGICAL RESOURCES

Biological resources have been divided into two categories, wildlife and botany.

3.5.1 WILDLIFE

Three pedestrian surveys were conducted of the project area and relevant surrounding landscape. The surveys were conducted on September 10, 12, and 16, 2010 by wildlife biologist Charles Black. Additionally, a 1.0 mile line-of-sight survey was conducted for raptor nests using 10x40 binoculars. Prior to conducting on-site surveys, the U.S. Fish and Wildlife Service (USFWS) Listed and Sensitive Species in Rio Arriba County, and the NM Department of Game and Fish (NMDGF) BISON-M databases were reviewed and downloaded. The purpose of the surveys was to inspect and document the potential presence of threatened, endangered, or special status animal species listed by the USFWS and NMDGF (Black 2010).

No threatened, endangered, or special status wildlife species were observed within or adjacent to the project area during the September 10, 12 and 16, 2010 wildlife surveys.

The project area is deemed suitable habitat for 2 Federal Species of Concern, the Townsend's big-eared bat (*Corynorhinus townsendii*), and American peregrine falcon (*Falco peregrinus anatum*). Additionally, the project area has suitable habitat for 1 State of NM Threatened species, the gray vireo (*Vireo vicinior*), and 2 State of NM Sensitive Taxa, the loggerhead shrike (*Lanius ludovicianus excubitorides*) and red fox (*Vulpes vulpes fulva*).

Townsend's big-eared Bat: The project site provides suitable forage habitat for Townsend's big-eared bat. This species occurs in dry grasslands, coniferous and deciduous forests. Foraging habitat includes insect-rich riparian areas, wetlands, forest edges and open woodland. Summer day and night roosts include caves, old mines, and buildings which also provide suitable hibernating sites. No bats or bat sign were observed during the survey.

American Peregrine Falcon: No suitable nest structures for this raptor are present anywhere near the proposed project area. The project area is suitable migration habitat for peregrines.

Red Fox: The project site is suitable habitat for this nocturnal species. No fox sign or burrows were observed during surveys. It is likely that red foxes occasionally occur within the project area.

Gray Vireo: The project area contains suitable habitat for nesting gray vireos. No vireos were observed during surveys, although gray vireos generally vacate their breeding grounds by September 1.

Loggerhead Shrike: The project area contains suitable habitat for Loggerhead shrikes. Shrikes are probably a fairly common breeder and migrant in more shrubby parts of the project area.

Migratory Birds

Migratory birds are protected under the Migratory Bird Treaty Act. Birds protected under the Act include all common songbirds, waterfowl, shorebirds, hawks, owls, eagles, ravens, crows, native doves and pigeons, swifts, martins, swallows and others, including their body parts (feathers, plumes etc.), nests, and eggs. The Act protects migratory birds from a "take". Take is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities". A "take" does not include

habitat destruction or alteration, as long as these is not a direct taking of birds, nests, eggs, or parts thereof.

Twenty-one species observed during the wildlife surveys are protected under the Migratory Bird Treaty Act.

3.5.1.1 Wildlife Species Observed During the Surveys

Table 6 provides a list of all species observed during the wildlife surveys conducted in the spring of 2010.

Table 6. Wildlife species documented during surveys.

SPECIES
Birds
Red-tailed hawk (<i>Buteo jamaicensis</i>)
American kestrel (<i>Falco sparverius</i>)
Mourning dove (<i>Zenaidura macroura</i>)
Barn swallow (<i>Hirundo rustica</i>)
Horned lark (<i>Eremophila alpestris</i>)
Common raven (<i>Corvus corax</i>)
Black-billed magpie (<i>Pica hudsonia</i>)
Bewick's wren (<i>Thryomanes bewickii</i>)
Blue-gray gnatcatcher (<i>Poliophtila caerulea</i>)
Western scrub jay (<i>Aphelocoma californica</i>)
Western bluebird (<i>Sialia mexicana</i>)
American robin (<i>Turdus migratorius</i>)
Juniper titmouse (<i>Baeolophus ridgwayi</i>)
Yellow-rumped warbler (<i>Dendroica coronata</i>)
Townsend's warbler (<i>Dendroica townsendi</i>)
Spotted towhee (<i>Pipilo maculates</i>)
Dark-eyed junco (<i>Junco hyemalis</i>)
Chipping sparrow (<i>Spizella passerina</i>)
Vesper sparrow (<i>Pooecetes gramineus</i>)
Lark sparrow (<i>Chondestes grammacus</i>)
Pine siskin (<i>Carduelis pinus</i>)
Western meadowlark (<i>Sturnella neglecta</i>)
Mammals
Rocky Mountain Elk (<i>Cervus canadensis</i>)
Mule Deer (<i>Odocoileus hemionus</i>)
Desert cottontail (<i>Sylvilagus audubonii</i>)
Black-tailed jackrabbit (<i>Lepus californicus</i>)
Coyote (<i>Canis latrans</i>)
Reptiles and Amphibians
Whiptail spp. (<i>Cnemidophorus spp.</i>)

Source: (Black 2010)

Note: Mammal observations tend to be from tracks, scat, and other sign.

For a list of all USFWS and NMDGF listed wildlife species with the potential to occur in the project area, refer to the Wildlife Survey Report provided as Appendix A.

3.5.2 BOTANY

The project area was surveyed from October 5-9, and on October 12, 2010 by Winnie Devlin. The survey of the proposed project area was conducted at 40- to 50-foot intervals following a zigzag pedestrian

transect. The purpose of the surveys was to inspect and document the potential presence of plant species listed as rare for Rio Arriba County by the NM Rare Plant Technical Council (NMRPTC 1999). In addition, all plants occurring in the project area were identified to the extent possible in order to determine the presence and extent of any State-listed noxious weeds (NMDA 2009, Devlin 2010).

A total of 16 species are listed by the NMRPTC and they are listed below in Table 7.

Table 7. Species listed as rare for Rio Arriba County, NM by the NM Rare Plant Technical Council.

Species	Common Name
<i>Abronia bigelovii</i>	tufted sand verbena
<i>Astragalus cyaneus</i>	cyanic milkvetch
<i>Astragalus micromerius</i>	Chaco milkvetch
<i>Astragalus missouriensis</i>	Pagosa milkvetch
<i>Astragalus oocalycis</i>	Arboles milkvetch
<i>Astragalus ripleyi</i>	Ripley's milkvetch
<i>Delphinium robustum</i>	robust larkspur
<i>Draba heilii</i>	Heil's alpine whitlowgrass
<i>Hackelia hirsuta</i>	New Mexico stickseed
<i>Lorandersonia microcephala</i>	small-headed goldenweed
<i>Mentzelia conspicua</i>	Chama blazing star
<i>Physaria pruinosa</i>	Pagosa bladderpod
<i>Salix arizonica</i>	Arizona willow
<i>Senecio cliffordii</i>	Clifford's groundsel
<i>Astragalus puniceus</i> var. <i>gertrudis</i>	Taos milkvetch
<i>Phlox caryophylla</i>	Pagosa phlox

Of the 16 species listed as rare in Rio Arriba County, NM, 14 of the species—tufted sand verbena (*Abronia bigelovii*), cyanic milkvetch (*Astragalus cyaneus*), Chaco milkvetch (*Astragalus micromerius*), Pagosa milkvetch (*Astragalus missouriensis*), Arboles milkvetch (*Astragalus oocalycis*), Ripley's milkvetch (*Astragalus ripleyi*), robust larkspur (*Delphinium robustum*), Heil's alpine whitlowgrass (*Draba heilii*), New Mexico stickseed (*Hackelia hirsuta*), small-headed goldenweed (*Lorandersonia microcephala*), Chama blazing star (*Mentzelia conspicua*), Pagosa bladderpod (*Physaria pruinosa*), Arizona willow (*Salix arizonica*) and Clifford's groundsel (*Senecio cliffordii*) — none were found during the survey due to a lack of potential habitat in the project area (Devlin 2010).

Although there is potential habitat in the project area for the remaining two species listed as rare in Rio Arriba County, NM—Taos milkvetch (*Astragalus puniceus* var. *gertrudis*) and Pagosa phlox (*Phlox caryophylla*)—neither of these species was found during the survey (Devlin 2010).

There are no Federal listed plant species for Rio Arriba County, New Mexico.

Four State-listed noxious weed species occurred within the project area: cheatgrass (*Bromus tectorum*), Russian olive (*Elaeagnus angustifolia*), salt cedar (*Tamarix* sp.), and Siberian elm (*Ulmus pumila*). Although not abundant in the project area, cheat grass did occur along the roadside, several arroyos, and other disturbed edges. The three noxious tree species were found in erosion control features adjacent to the active mine. The erosion control features periodically hold water. The resulting damp soil is conducive to the three species. All four species are listed as NM Class C noxious weed species, “widespread in the state”, and for which “management decisions...should be determined at the local level, based on feasibility of control and level of infestation” (NMDA 2009). While not officially listed as noxious weeds, tumbleweed (*Salsola tragus*) and mullein (*Verbascum thapsus*) were also found in disturbed areas.

The Plant Survey Report prepared for the project area by a qualified botanist is provided in its entirety as Appendix B.

3.5.2.1 Plant Species Observed During the Surveys

Table 8 provides a list of all species observed during the botanical surveys.

Table 8. Plant species documented during surveys.

TABLE 8. PLANT SPECIES DOCUMENTED DURING SURVEYS.	
Species	Common Name
Trees	
<i>Elaeagnus angustifolia</i>	Russian olive
<i>Juniperus monosperma</i>	One-seeded juniper
<i>Pinus edulis</i>	Piñon pine
<i>Pinus ponderosa</i>	Ponderosa pine
<i>Populus sp.</i>	Cottonwood
<i>Salix sp.</i>	Willow
<i>Tamrix sp.</i>	Salt cedar
<i>Ulmus pumila</i>	Siberian elm
Shrubs & Subshrubs	
<i>Artemisia tridentata</i>	Big leaf sagebrush
<i>Artemisia frigida</i>	Fringed sage
<i>Atriplex canescens</i>	Four-winged saltbush
<i>Chrysothamnus greenei</i>	Green's chamisa
<i>Chrysothamnus nauseosus</i>	Rubber rabbitbrush
<i>Krascheninnikovia lanata</i>	Winterfat
<i>Gutierrezia sarothrae</i>	Broom snakeweed
<i>Chrysothamnus depressus</i>	Longflower rabbitbrush
<i>Clematis ligusticifolia</i>	Western virgin's bower
<i>Eriogonum microthecum</i>	Slender buckwheat
<i>Fallugia paradoxa</i>	Apache plume
<i>Forestiera neomexicana</i>	New Mexico olive
<i>Lycium pallidum</i>	Wolfberry
<i>Rhus trilobata</i>	Skunkbush
<i>Ribes cereum</i>	Wax currant
<i>Tetradymia canescens</i>	Spineless horsebrush
Cacti	
<i>Coryphantha vivipara</i> var. <i>arizonica</i>	Arizona pincushion
<i>Cylindropuntia imbricata</i>	Cholla
<i>Echinocereus triglochidiatus</i>	Claret cup cactus
<i>Opuntia phaeacantha</i>	Pricklypear
<i>Opuntia polyacantha</i>	Plains pricklypear
<i>Yucca baccata</i>	Banana yucca
<i>Yucca glauca</i>	Soapweed yucca
Grasses	
<i>Achnatherum hymenoides</i>	Indian ricegrass
<i>Agropyron smithii</i>	Western wheatgrass
<i>Agropyron intermedia</i>	Intermediate wheatgrass
<i>Aristida divaricata</i>	Poverty threeawn
<i>Aristida longiseta</i>	Red threeawn
<i>Aristida purpurea</i>	Purple three awn
<i>Bouteloua curtipendula</i>	Sideoats grama
<i>Bouteloua eriopoda</i>	Black grama
<i>Bouteloua gracilis</i>	Blue grama
<i>Bouteloua hirsuta</i>	Hairy grama

TABLE 8. PLANT SPECIES DOCUMENTED DURING SURVEYS.

Species	Common Name
<i>Bromus tectorum</i>	Cheatgrass
<i>Elymus longifolius</i>	Bottlebrush squirreltail
<i>Festuca arizonica</i>	Arizona fescue
<i>Hordeum jubatum</i>	Foxtail barley
<i>Muhlenbergia torreyi</i>	Ring muhly
<i>Munroa squarosa</i>	False buffalograss
<i>Pascopyrum smithii</i>	Western wheatgrass
<i>Pleuraphis jamesii</i>	James' galleta
<i>Schizachyrium scoparium</i>	Little bluestem
<i>Sporobolus airoides</i>	Alkali sacaton
<i>Sporobolus cryptandrus</i>	Sand dropseed
<i>Stipa comata</i>	Needle-and-thread
Forbs	
<i>Ameranthus hybridus</i>	Pigweed
<i>Ambrosia acanthicarpa</i>	Annual bursage
<i>Ambrosia psilostachya</i>	Western ragweed
<i>Arabis fendleri</i>	Fendler's arabis
<i>Artemisia dracunculus</i>	Taragon
<i>Artemisia ludoviciana</i>	Prairie sage
<i>Asclepias asperula</i>	Antelope horns milkweed
<i>Aster falcatus</i> var. <i>commutatus</i>	Heath aster
<i>Astragalus lentiginosus</i>	Beakpod milkvetch
<i>Astragalus missouriensis</i>	Missouri milkvetch
<i>Atriplex argentea</i>	Silverscale saltweed
<i>Bahia dissecta</i>	Bahia
<i>Brickellia eupatorioides</i>	False boneset
<i>Castilleja integra</i>	Foothills paintbrush
<i>Chaetopappa ericoides</i>	White aster
<i>Chamaesyce albomarginata</i>	Rattlesnake weed
<i>Chamaesyce serpyllifolia</i>	Thymeleaf spurge
<i>Chenopodium album</i>	Common lambsquarters
<i>Chenopodium berlandieri</i>	Netseed lambsquarters
<i>Chenopodium fremontii</i>	Fremont lambsquarters
<i>Chenopodium leptophyllum</i>	Narrow-leaved goosefoot
<i>Cirsium ochrocentrum</i>	Yellowspine thistle
<i>Cleome serrulata</i>	Rocky Mountain bee plant
<i>Conyza canadensis</i>	Horseweed
<i>Cryptantha crassisejala</i>	Thicksepal hiddenflower
<i>Cryptantha paysonii</i>	White hiddenflower
<i>Dalea purpurea</i>	Purple prairie clover
<i>Dalea scariosa</i>	La Joya prairieclover
<i>Descurainia obtusa</i>	Blunt tansy mustard
<i>Descurainia sophia</i>	Flixweed
<i>Dysphonia graveolens</i>	Fetid goosefoot
<i>Eriogonum cernuum</i>	Nodding buckwheat
<i>Gaillardia pinnatifida</i>	Yellow blanket flower
<i>Helianthus annuus</i>	Annual sunflower
<i>Heterotheca villosa</i>	Hairy golden aster
<i>Hymenopappus filifolius</i>	White ragweed
<i>Hymenoxis richardsonii</i>	Rubberweed
<i>Ipomopsis aggregata</i>	Skyrocket
<i>Ipomopsis laxiflora</i>	Slender trumpet gilia
<i>Lactuca serriola</i>	Prickly lettuce
<i>Lappula occidentalis</i>	Cupseeded stickseed
<i>Lepidium montanum</i>	Pepperweed

TABLE 8. PLANT SPECIES DOCUMENTED DURING SURVEYS.	
Species	Common Name
<i>Lesquerella fendleri</i>	Fendler bladderpod
<i>Linum lewisii</i>	Blue flax
<i>Machaeranthera canescens</i>	Purple aster
<i>Machaeranthera linearis</i>	Narrowleaf purple aster
<i>Machaeranthera parviflora</i>	Small-flowered tansyaster
<i>Melilotus alba</i>	White sweetclover
<i>Mentzelia multiflora</i>	Many-flowered blazing star
<i>Mirabilis linearis</i>	Narrowleaved four o'clock
<i>Mirabilis multiflora</i>	Giant four o'clock
<i>Monarda pectinata</i>	Plains pagoda plant
<i>Oenothera caespitosa</i>	Stemless evening primrose
<i>Orobanche ludoviciana</i>	Louisiana broomrape
<i>Penellia micrantha</i>	Slimleaf purple mustard
<i>Penstemon angustifolius</i>	Narrowleaf penstemon
<i>Physalis hederifolia</i>	Ivy-leaved groundcherry
<i>Physalis virginiana</i>	Virginia groundcherry
<i>Plantago patagonica</i>	Wooly plantain
<i>Portulaca oleracea</i>	Common purslane
<i>Psilostrophe tagetina</i>	Paper flower
<i>Salsola tragus</i>	Russian-thistle
<i>Senecio riddellii</i>	Riddell's groundsel
<i>Solanum heterodoxum</i>	Melonleaf nightshade
<i>Solanum sarrachoides</i>	Hairy nightshade
<i>Sphaeralcea angustifolia</i>	Narrowleaf globemallow
<i>Sphaeralcea coccinea</i>	Scarlet globemallow
<i>Sisymbrium altissimum</i>	Tumblemustard
<i>Stephanomeria pauciflora</i>	Skeleton weed
<i>Taraxacum officinalis</i>	Dandelion
<i>Thelesperma filifolium</i>	Indian tea
<i>Thelasperma megapotamicum</i>	Cota
<i>Tragopogon dubius</i>	Western salsify
<i>Verbascum thapsus</i>	Mullein
<i>Verbena bracteata</i>	Carpet-verbena
<i>Verbesina encelioides</i>	Cowpen daisy

Source: (Devlin 2010)

3.6 CULTURAL RESOURCES

A cultural resource records search and field inventory were performed on both the BLM-East and BLM-West parcels. The inventory was conducted between September 5 and 9, 2010 by Complete Archaeological Service Associates (CASA). Additional fieldwork was also performed by CASA and Cibola Research Consultants on October 12-13, 2010. The results of the inventory are documented in a report maintained in the central files of the TFO (CASA 2010). Because information on the nature and location of cultural resources is proprietary, the report (CASA 10-79) is incorporated by reference into this EA.

3.7 VISUAL RESOURCES

The BLM manages lands using a Visual Resource Management (VRM) program. The guidance is provided to maintain the quality of visual values according to VRM class objectives. Currently, the project area has not been allocated management objectives for visual resources in the 1988 Taos Resource Plan. However, it was rated as having values fitting Class III Objectives in the Visual Inventory in 2006.

Factors evaluated in the inventory were landform, vegetation, water, color, adjacent scenery, scarcity, cultural modifications, public sensitivity, and distance. Public land immediately surrounding the project area was found to have a relative scenic value of Class III in the inventory. VRM objectives are determined through the land use planning process which considers balancing management of all resources and resource uses as well as public input. The management objectives for a Class III area are “to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.” (BLM 1986).

Typically, views are uninterrupted throughout the eastern Jemez foothills with few structures visible except two track routes, barbed wire fencing, and the occasional power line in the distance. This leaves one with an impression of space and remoteness. However along travel routes, intrusions are more numerous and apparent including signs, highways, power lines, and residences. Vegetation typically changes from yellow and pastel green grasses with grey/green sage on the flatter lowlands to silhouetted dark green coarsely textured conifers gradually climbing up the slopes of the surrounding mountains. Texture of vegetation is finer on the plateau-like foothills with uneven and random patches of grouped shrubs, conifer savanna, and grass. Coarseness increases, from the open meadows in the project area heading upslope to the peaks, as vegetation changes from shrub-grassland and savanna to forests of conifers. This change sometimes appears abrupt due to vegetation forming a digitate pattern following the flow of water along ridges and canyons. However, much of the area has a patchy gradation from the forested mountains to the Rio Grande Valley below. The landform is relatively flat to undulating in the project area with strong diagonal ridges and slopes moving into the mountains. Colors include tan, beige with rusts, dark brown, peach, pink, and off-white.

31-Mile Road is the primary roadway providing access for observers in and near the project area. Short-term observers often travel 31-Mile Road to access private land, BLM land, Forest Service land, and State of NM land. Although project area lands provide recreational opportunities and may attract the occasional observer to the immediate project area, various other public lands surrounding the project area provide far better opportunities and tend to receive heavier use. In general, the project area receives relatively small numbers of short-term transient observers, mostly during daylight hours of warm weather months.

There is one residential area on private land \approx 2,179 feet from BLM-West and \approx 4,133 feet from BLM-East. Development on the private land is in two concentrations and consists of a few dozen structures, water tanks, roadways, paths, and parking areas that are grouped and oriented along 2 small topographic high points overlooking Arroyo de la Plaza Larga to the north. The closest structure to the BLM-West parcel is \approx 3,400 feet away. The nearest structure to the BLM-East parcel is \approx 6,060 feet away. Small numbers of people live in this residential area year-round. Periodically, groups of people travel west on 31-Mile Road past the proposed project area and the existing RMM to attend gatherings at this residential area. These people may be able to partially view the project area from the residential area and all are able to briefly view the project area while traveling 31-Mile Road.

Travelers on 31-Mile Road passing through the project area can see mining disturbance south of the roadway. Most users in the project area travel in passenger vehicles and light duty trucks; however, occasional use from pedestrians, equestrians, and Off-Highway Vehicle (OHV) users also may occur. Most of these observers pass through the proposed project area within a matter of minutes and are considered short-term users. Short-term observers traveling 31-Mile Road typically only remain in the immediate project area a short time, and most proceed through the area without stopping.

Major alignments of 31-Mile Road, uphill and northwest of the project area, are 1,000 feet or more higher in elevation than project area lands (Figure 8). Vehicles traveling 31-Mile Road can readily observe the existing RMM and proposed BLM parcels. Travellers headed east and downhill toward the RMM have better visibility of the project area than those traveling away from the area.

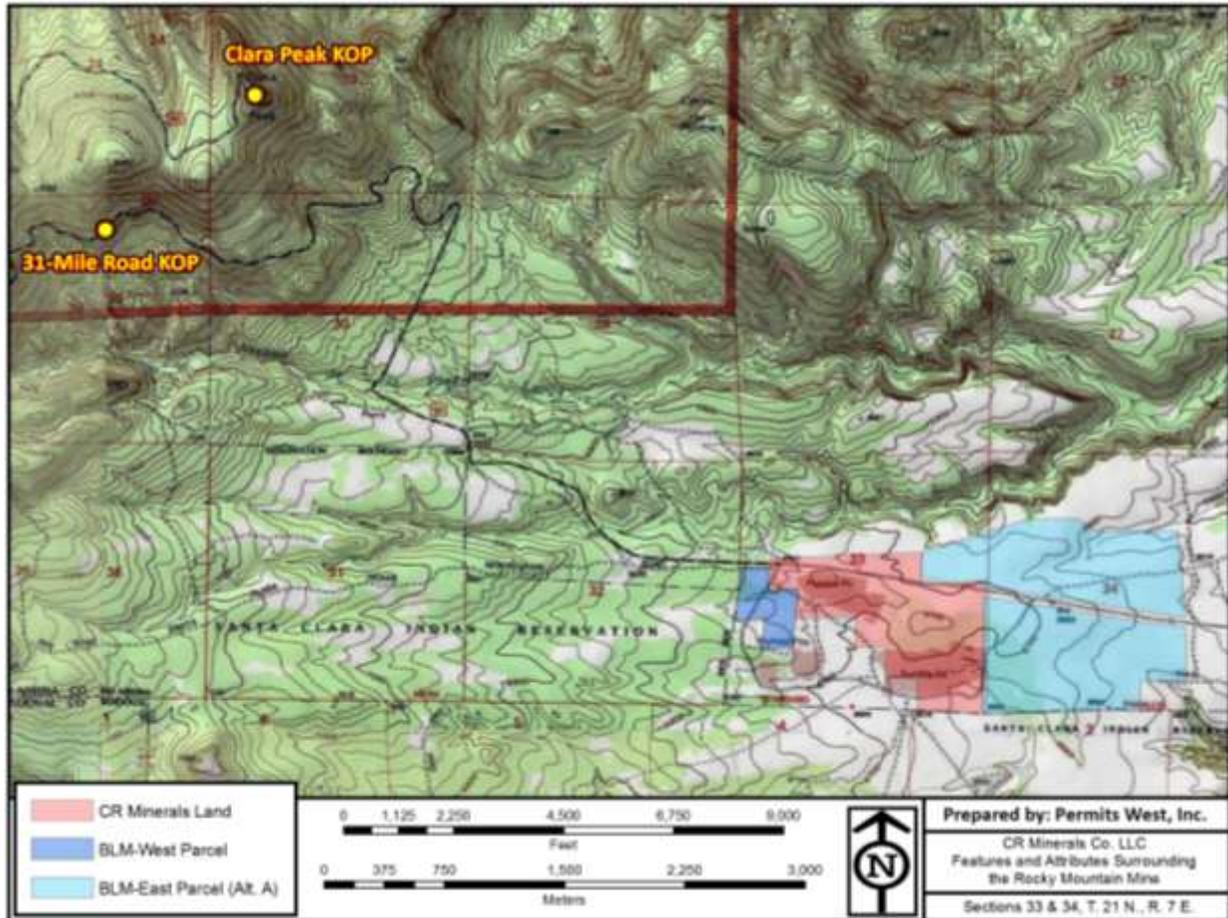


Figure 8. Location of Key Observation Points and photos of project area.

The visibility, contrast, and overall visual character of the project area were documented during a site visit conducted on June 9, 2011. Two Key Observation Points (KOPs) were chosen for completion of Visual Contrast Rating Worksheets (Form 8400-4). The first, 31-Mile Road KOP, is located at a point along 31-Mile Road (36.028039 N, 106.250331 W) on Forest Service land along a large traversing climb/descent with clear unobstructed views of the project area (Figure 8). The second, Clara Peak KOP, is located atop Clara Peak (36.035522 N, 106.240481 W) on Forest Service land at the site of an old structural foundation and also has unobstructed views. Figure 8 displays the location of the 2 KOPs.

Cerro Roman is a minor rounded summit just north of the project area. Multiple attempts were made to access high ground on the summit or south flanks of Cerro Roman (Sections 20, 21, 28, and 29, T. 21 N., R. 7 E.) along existing roadways from the south and east. However, vehicle access to this area is not well established and the only alignment is an extremely deteriorated, loose, rocky OHV 2-track. This 2-track is extremely rugged and severely limits access for the majority of the general public from roadways to the east.

The existing RMM, as viewed from the 31-Mile Road KOP (Figure 9) and the Clara Peak KOP (Figure 10), captures the existing condition and current visual character from two vantages outside the immediate project area. Numerous photos were taken from locations on Forest Service and BLM land along 31-Mile Road, and on a 2-track OHV trail east of Cerro Roman. However, no Visual Contrast Rating Worksheets (Form 8400-4) were completed for these locations because the 31-Mile Road KOP and Clara Peak KOP both provide better, more readily apparent views of the project area.



Figure 9. View looking southeast from 31-Mile Road KOP.



Figure 10. View looking southeast from Clara Peak KOP.

Existing waste overburden stockpiles at the RMM are currently piled south of the existing active pit. These stockpiles have been placed by several different operators over the life of the mine. Overburden at the RMM is light in color and has a higher value than surrounding vegetated lands. The overburden has differing levels of vegetative cover from smooth to coarse. This makes the RMM more readily apparent and attracts the attention of the casual observer from the selected KOPs. There are few berms surrounding the RMM. Currently, CRM does not interim seed overburden stockpiles and is not required

to under its current NM MMD mining permit. As such, fugitive dust lifted by wind directly affects visual resources in and surrounding the project area. However, CRM has already initiated reclamation efforts and has plans to completely reclaim and seed 10+ acres in 2011 on CRM and BLM lands.

There were 2 visual issue identified during scoping for this EA.

3.8 AIR QUALITY

The project area is within an area that is generally in attainment with New Mexico Environment Department (NMED) Air Quality Bureau and U.S. Environmental Protection Agency (EPA) air quality standards. The nearest air quality monitoring stations are in Santa Fe. The first, “25.75 miles from the project area, while the second, “3SFA Santa Fe Airport” is ≈27 miles from the project area. The Santa Fe Runnels air monitoring station is in a municipal setting while the Santa Fe Airport station is located in a rural setting.

Occasionally, emissions of fugitive dust in Rio Arriba County reach levels that exceed NMED and EPA standards. The sources of fugitive dust emissions in the region are numerous, and some emissions are from the RMM and other mining operations or disturbed lands. However, vehicles traveling over unpaved, often unimproved roadways in the region are likely the most significant source of man-made fugitive dust emissions in the area. The RMM currently has stockpiles of overburden and pumice waste products that are lifted during high wind events. These stockpiles are not currently seeded nor are they required to be seeded under the existing NM MMD permit. Fugitive dust emissions from disturbed areas are more frequent when sustained and gusty winds occur. Elevated and gusty winds tend to occur in the springtime (March-May) in northern New Mexico and exceedances of NMED and EPA air quality standards generally occur in the spring in northern NM.

3.9 NOISE RESOURCES

Noise sources associated with to the RMM include those from active mining, screening, processing and sorting, stockpiling, and loading of overburden and pumice material. The majority of the RMM is currently below grade within a large depression with several approximately 30+ foot tall highwall at the north end of the mining area. This helps insulate noise emissions from the mine and reduces negative effects to receptors of all types. Haul truck traffic also generates noise; however, the volume of traffic is directly linked to customer demand and varies greatly depending on local, national, and international pumice demands. Also, less production is typically required to meet winter demands and the subsequent traffic is typically reduced during cold weather months.

Potential receptors of noise emitted from the RMM and proposed BLM parcels are year-round residents of the private residential area northwest of the project area (between 2,179’ and 4,133’ away), visitors to either public or private lands immediately surrounding the project area, and people traveling through the project area on 31-Mile Road.

3.10 TRAFFIC

Traffic on 31-Mile Road in the project area can be characterized as infrequent light duty passenger vehicles and hauling dump trucks navigating the roadway typically during daylight hours. Traffic tends to be highly variable based on season and road condition. CRM maintains 31-Mile Road to the mine on an as-needed basis to ensure safe operating conditions for haul trucks. This maintenance largely relieves Rio Arriba County of much of the responsibility for maintenance of the roadway.

The closest private landowner, northwest of the project area, periodically entertains people for gatherings. Leading up to and during these events, the predominant traffic on 31-Mile Road is light duty passenger vehicles. However, these events are short-term and usual traffic patterns of infrequent light duty passenger vehicles and hauling dump trucks quickly resumes.

Semi-trucks hauling RMM pumice constitute the majority of heavy truck traffic on 31-Mile Road. Currently, depending on demands, CRM operates between 8-13 trucks trips per day on 31-Mile Road and only operate for a maximum of 12 hours per day and only during daylight hours. Once the trucks reach US 84/285, they become an insignificant proportion of the overall traffic volume and type on this main arterial highway.

Other traffic types on 31-Mile Road include infrequent, short-term and transient traffic from recreational and other users seeking undeveloped opportunities on BLM and other public lands in and around the project area. 31-Mile Road provides access to National Forest System, State of NM, and other private lands and is the primary roadway used to access these lands during all seasons. Winter recreational traffic is more limited due to difficult access and road conditions past the RMM.

3.11 FORESTRY RESOURCES

Each of the BLM parcels has one contiguous stand of piñon-juniper (PJ) woodland. The PJ-woodland stand on the BLM-East parcel is ≈51 acres in size. This acreage does not include land with dispersed tree cover or shrubs. The wooded acreage of the BLM-West parcel is ≈5 acres. Again, this does not include areas with low tree densities or widely dispersed trees or shrubs.

3.12 HUMAN HEALTH AND SAFETY

Human health and safety is currently protected at the RMM by placement of continuous fencing and cautionary signage at numerous locations on the south fence along 31-Mile Road. The RMM access road has two steel posts installed in the south fence line that provide stable attachment points for a chain. A chain is strung between the posts and locked during off hours to exclude unauthorized access.

Earthen berms, as required by MSHA, are constructed across the RMM property using overburden. The locations of these MSHA berms regularly change as they are constructed and dismantled according to the changing mine environment. These MSHA berms are designed to manage and control mine equipment and haul truck traffic within the mine to avoid accidents and dangerous working conditions.

RMM personnel also receive regular, mandatory health and safety training pursuant to the provisions of 30 CFR Part 48 to ensure proper procedures and techniques are undertaken while operating at the RMM.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 DIRECT AND INDIRECT EFFECTS

4.1.1 ALTERNATIVE A: PROPOSED ACTION

4.1.1.1 Land Tenure and Use

Land tenure and use would be directly affected by the extension of the mine onto ≈380.5 acres of BLM land. In the short-term, project area lands would be dedicated to the extraction of pumice material. Issuance of grazing permits for the Cerro Negro 537 allotment would be reduced by the amount of forage lost on the ≈380.5 acres. Currently, the Cerro Negro 537 allotment is not being leased. So, adjustment to the total number of stock permitted to graze would not be affected. As a result, there would be no effect to livestock or ranching operations as a result of the Proposed Action.

BLM lands within the project area that provide undeveloped recreation opportunities would be affected in the short-term. The activity of mining may deter certain land uses near the project area. The mine would progress through the landscape over time which would displace undeveloped recreational users. However, large amounts of land surrounding the project area are public lands which provide the same undeveloped opportunities. The surrounding public lands would absorb any recreational use without being affected.

All areas affecting land use would be concurrently reclaimed to replace the lost form and character of the original site. The seed mix that TGP would use would be a BLM approved seed mix that would replace the plant community lost during initial stripping operations. Once a viable community of vegetation establishes on reclaimed areas, a land use of grazing would resume across all BLM parcels.

No active negotiations for “disposal” lands within the project area are taking place and no effect would occur to any land acquisition negotiations.

4.1.1.2 Geology Resources

Geologic resources in the project area would be directly affected by the Proposed Action. All desirable pumice ore would be permanently removed from ≈248.3 acres. The removal of pumice material and disturbance of overburden under the Proposed Action would result in an alteration to the areas landform creating depressed areas. However during concurrent reclamation, any highwalls or steep slopes would be reduced to slopes no steeper than 3 (horizontal) to 1 (vertical). This earthwork activity would stabilize project area lands and protect geologic resources adjacent to the property. Also, final reclamation would be performed to mimic the geomorphology of the existing landscape as illustrated in Figure 6.

4.1.1.3 Soils Resources

In the short-term, soils in the project area within mining blocks would be disturbed, compacted, scraped, and entirely removed. Outside of mining blocks, soils beneath roadways and stockpiles would be compacted, and buried. All topsoil would be discreetly stockpiled and interim seeded in order to maintain long-term soil viability. Over the long-term, topsoil would be spread across the surface of Direct Impact Acreages during final reclamation and seeded with a BLM approved seed mix.

As a result, topsoil would be impacted within the project area in the short-term during stripping and stockpiling. However over time, the stabilized topsoil would be reused as a seed bed during final reclamation. Therefore, a short-term negative effect to soils on ≈326 acres would occur from the Proposed Action but those effects would decrease as the topsoil is stockpiled, stabilized, reused, seeded, and avoided.

4.1.1.4 Water Resources

Proposed mining extension activities would alter the drainage pattern at the project site. There are only a few small ephemeral channels within the project area and most quickly drain offsite. Where possible, CRM would completely avoid direct use of drainage bottoms and channels for mining and stockpiling. There would be no releases of hazardous substances as part of mining activities. Interim seeded earthen berms would be constructed as necessary at low spots to control surface water from entering or leaving active mining areas. This would also minimize erosion and prevent sedimentation of adjacent drainages. As a result, there would be no direct or indirect effects to surface or groundwater resources or water quality from implementation of the Proposed Action.

4.1.1.5 Biological Resources

Wildlife: No threatened, endangered, or special status wildlife species were observed within or adjacent to the project area (Black 2010). Potential habitat for 1 State of NM Threatened species, the gray vireo, was located on the proposed site.

Townsend's big-eared Bat: Given the relatively small scale of the proposed disturbance, this species should not be adversely impacted by the proposed project.

American Peregrine Falcon: Given the relatively small scale of the proposed disturbance, this species should not be adversely impacted by the proposed project.

Red Fox: Given the relatively small scale of the proposed disturbance, this species should not be adversely impacted by the proposed project.

Gray Vireo: Direct effects to nesting vireos could occur if vegetation removal is not appropriately timed. See Wildlife Mitigations below for methods that would be employed to ensure no adverse effects to vireos would occur.

Loggerhead Shrike: Given the relatively small scale of the proposed disturbance, no take is anticipated and this species should not be adversely impacted by the proposed project.

Migratory Birds: No take of migratory birds is anticipated under the Proposed Action and no direct effects to migratory birds would occur if vegetation removal is appropriately timed. A slight indirect effect to migratory birds would occur due to a temporary loss of habitat for species that favor those found in the project area.

Raptors: No raptor nests were located within 1 mile of the project area during surveys. Therefore, no direct or indirect effects to raptors would occur.

Other Wildlife: A slight indirect effect to wildlife would occur from the temporary loss of habitat and forage during active mining. Smaller, less mobile wildlife species may be affected more heavily than larger mobile wildlife. Small burrowing animals and any species that use the substrate for shelter may be taken during mining activities. Although individuals of a particular species may be lost, populations of non-sensitive species would not be greatly affected as a whole.

Wildlife Mitigations:

1. No tree removal associated with the proposed project would be conducted during the gray vireo or any other migratory bird nesting season (March 1-August 1).

Botany: Direct negative effects would occur in the short-term to ≈326 acres of the plant community that currently occupies the project area. Under the Proposed Action, all plant material would be removed and handled according to TFO guidance in order to enable stripping of overburden.

None of the 16 species listed as rare in Rio Arriba County, NM, were found in the project area during the survey. Fourteen species lacked suitable habitat and two species listed as rare in Rio Arriba County, Taos milkvetch (*Astragalus puniceus* var. *gertrudis*) and Pagosa phlox (*Phlox caryophylla*) had potential habitat but were not present (Devlin 2010). Also, there are no Federal listed plant species for Rio Arriba County, New Mexico.

Slight indirect effects to botanical resources would occur on ≈326 acres due to the temporary loss of habitat from removal of the soil substrate or burial. However, following final reclamation of the project area, earthwork and topsoil spreading would reestablish suitable habitat for a replacement plant community in the project area. Certified weed-free seeding would then stabilize earthwork and protect the newly replaced habitats for surrounding native plant species to expand onto.

4.1.1.6 Cultural Resources

No Traditional Cultural Properties or Native American Religious Concerns were highlighted during scoping. All sensitive cultural resources would be avoided. As a result, no direct or indirect effects to cultural resources are expected from implementation of the Proposed Action. However, in the event that buried cultural deposits are discovered during construction, work would cease and the Taos BLM would be notified so a qualified archaeologist may perform an evaluation of the findings.

Cultural Mitigations:

1. If undocumented cultural resources are discovered during construction and operation of the Proposed Action, work would immediately cease and the BLM TFO archaeologist would be contacted for guidance.

4.1.1.7 Visual Resources

Direct effects to visual resources would occur from implementation of the Proposed Action. The mine property would extend onto an additional ≈ 380.5 acres over time. However, the total number of acres open at a single time would be limited to 3 mining blocks which would be a reduction from that currently open on CRM land. The total number of long-term year-round residential observers and short-term recreational and transient observers likely to view the project area would not change. However, the duration of visibility to travelers on 31-Mile Road depending on the stage of mine progression would increase as the mine would extend along a longer section of 31-Mile Road than it does currently.

Two Visual Contrast Rating Worksheets (Form 8400-4) were completed from observation points atop Clara Peak, and from a point on 31-Mile road along a traverse northwest of the project area (Figure 8). There would be a moderate degree of contrast to form, line, color, and texture of the land and a moderate contrast to form, line, and color of vegetation from observation points viewing down into the project area. Moderate contrasts resulting from the Proposed Action would meet Class III objectives.

The proposed mine property may be visible from various observation points; however, the level of severity of change would likely improve from that currently present. The additional vegetative cover from interim seeding on both CRM and BLM lands would help control dust from wind erosion during active mining. Interim seeding would also reduce the moderate contrast, lightly colored overburden stockpiles. Vegetative cover would also break up the form and line of above grade topsoil and overburden stockpiles and containment berms and reduce visibility of the mine to the casual observer traveling 31-Mile Road. For those observers viewing the project area from above (Clara Peak, Cerro Roman, 31-Mile Road on Forest Service land), the floor and highwalls of the mine would be visible and the near white color of the pumice ore would not be mitigated once uncovered. As a result, as interim seeding progresses, a reduction of open, unvegetated acreage from the current condition would occur (regardless of which 3 mining blocks are active), but the mine would still catch the attention of the casual observer from closer observation points that view into the project area.

Although the overall proposed footprint of the mine would increase under the Proposed Action, both partial and final reclamation would occur concurrent with mining. Earthwork and contouring associated with reclamation would imitate the natural character and form of the landscape as much as possible (reducing slopes to no steeper than 3 horizontal to 1 vertical), while reseeding would further stabilize reclamation earthwork, control dust, reduce contrast, break up linear features, introduce texture, and provide additional structure.

No indirect effects to visual resources would occur from the Proposed Action.

Visual Mitigations:

1. All above grade berms and topsoil and overburden stockpiles would be constructed and interim seeded using a BLM approved seed mix in order to reduce contrast and break up the linear feature and character of the berms and piles.
2. Blowing dust from the mine would be mitigated by reducing the total number of disturbed, open acres, and reseeding above grade containment berms, topsoil stockpiles, overburden stockpiles, and final reclamation blocks with a BLM approved interim or final reclamation seed mix to reduce dust emissions from disturbed open surfaces and slopes.

4.1.1.8 Air Quality

In northern New Mexico, disruption of air quality is largely a factor of winds blowing across disturbed areas and roadways, and is highly variable by time of day and season. Under the Proposed Action, extension of the RMM would disturb additional acreage (DIA of BLM-East and BLM-West = 326 acres), but the total acreage opened at a given time would decrease. Concurrent reclamation and interim and final seeding on an established schedule would reduce the total acreage open at a given progress point.

Also, there would be less open BLM land under the Proposed Action than that currently present. The reduction in total disturbed acreage, concurrent reclamation, and use of interim and final seed mixes would result in decreases in dust emissions from the RMM.

Production rates are not proposed to change significantly, and the RMM equipment and machinery would continue to be used as it is currently. Emissions from vehicles and equipment would remain similar to those currently occurring and would not significantly affect air quality locally or regionally. As the mine progresses, portions of the proposed mine property would be partially or entirely reclaimed which would reduce the amount of bare ground directly exposed to wind erosion.

No indirect effect to air quality would occur from the Proposed Action.

4.1.1.9 Noise

Noise sources proposed at the RMM would be similar to those currently emitting noise. The closest receptors to the proposed project area are on private land and the closest residence is $\approx 3,400$ feet from the northwest corner of BLM-West. The closest residence to the BLM-East parcel is $\approx 6,060$ feet away. Noise emissions data was not collected at the RMM. There have been no complaints regarding noise in the area and all noise emissions are limited to a maximum of 12 hours per day and only during daylight hours. Although CRM may decide to use a second crusher during mining operations on BLM land, it would only be used as necessary and would be located over $\frac{1}{2}$ mile from the nearest residential structure. It is not known whether the closest structures of interest are occupied by permanent year-round residents.

Air is a poor conductor and does not transmit sound well. This results in substantial reductions in noise levels as a listener moves away from the source. Significant reductions in noise could occur in as little as a few hundred feet depending on environmental conditions. Also, between the proposed BLM properties and the residential area to the northwest, relatively dense piñon-juniper cover (likely woodland) absorbs additional noise traveling away from the project area. Due to the substantial distances to the nearest permanent receptors and generally limited duration of stay within the project area for most short-term or transient users, noise emissions from the RMM would not have substantial direct negative effects to permanent, short-term, or transient listeners.

No operational expansion is proposed under the Proposed Action, and because the crusher and associated machinery would operate from within a pit, very little noise would be discernible at even the closest receptor distance of $\approx 3,400$ feet. Shifting winds may temporarily carry noise farther than it would otherwise travel; however, the frequency and intensity of wind is quite variable and generally, frequent winds out of the west tend to carry noise farther east away from development.

Noise emissions from mining would be at similar levels to those currently produced. Receptor standoff distances from the proposed extension property are far enough to largely eliminate negative effects. Also, key receptor positions would likely remain geographically similar or identical to those currently near the RMM.

No animal species were identified that would be particularly susceptible to noise; therefore, no direct negative effects from noise would result from the Proposed Action.

Under the Proposed Action, CRM would only operate the mine for a maximum of 12 hours per day and only during daylight hours. As a result, no direct or indirect effects to nighttime silence would occur.

4.1.1.10 Traffic

No direct or indirect negative effects to or from traffic would occur as a result of the Proposed Action. Heavy truck traffic from the RMM would not significantly increase under the Proposed Action. CRM is not obligated to maintain 31-Mile Road and would only do so at its own discretion. However, if required,

CRM may perform repair or maintenance to critically damaged or dangerous sections only to ensure that 31-Mile Road is safe for operation of haul trucks.

4.1.1.11 Forestry Resources

Forestry resources would be affected by the Proposed Action. Approximately 51 acres of Piñon-juniper woodland on BLM-East and ≈5 acres of piñon-juniper woodland on BLM-West would be entirely removed. Certain species of migratory birds including the gray vireo may use forested habitats in the project area. To mitigate any take to nesting migratory birds, no trees would be removed from the project area from March 1 to August 1 (See Wildlife Mitigations in Section 4.1.1.5).

Under the Proposed Action, CRM would manage, utilize, and dispose of all BLM administered forestry materials that occupy all Direct Impact Areas in the project area in accordance with all TFO Standard Operating Procedures (SOPs) and guidance.

4.1.1.12 Human Health and Safety

No direct or indirect negative effects to human health and safety would occur from the Proposed Action. CRM would install suitable exclusion structures at all mine access points to control unauthorized access to the mine. Continuous fencing and intervisible signage would also be installed along 31-Mile Road to notify visitors of the restricted access to and hazards within the mine area. All mine personnel would be required to take regular, mandatory training in order to work and operate safely in the mine environment.

4.1.2 ALTERNATIVE B: NO ACTION

4.1.2.1 Land Tenure and Use

No direct or indirect negative effects to land tenure and use would occur as a result of the No Action alternative. A No Action decision would not affect CRM's ability to move forward with mining remaining reserves on CRM land. CRM currently holds a NM MMD permit for extraction of reserves south of 31-Mile Road on CRM land. No additional authorizations are required for CRM to continue to mine the existing "mining area limits" as authorized by the NM MMD.

Under the No Action alternative, the existing primary land use of pumice mining would cease and the existing RMM would be mined out on CRM property and completely reclaimed. No new mining would occur and the ultimate land use in the project area would fall back to grazing.

4.1.2.2 Geology Resources

No additional mining would be permitted and therefore, no direct or indirect negative effects to geology resources would result from mining activities. However, if the No Action is selected, the local, national, and international pumice market would experience less competition and regional and national stockpiles may be reduced due to reduced production of regional and/or national reserves.

4.1.2.3 Soils Resources

Under the No Action alternative, soils on the BLM parcels would not be removed for mining. As a result, soils resources would not experience direct or indirect negative effects from the No Action alternative.

4.1.2.4 Water Resources

No direct or indirect negative effects to water resources would result from implementation of the No Action alternative.

4.1.2.5 Biological Resources

No direct or indirect negative effects to biological resources would result from implementation of the No Action alternative.

4.1.2.6 Cultural Resources

No direct or indirect negative effects to cultural resources would result from implementation of the No Action alternative.

4.1.2.7 Visual Resources

No direct or indirect negative effects to visual resources would result from implementation of the No Action alternative. Over time, the existing RMM would be mined out and reclaimed which would have a direct positive effect on visual resources from elimination of above grade berms and piles, reducing contrast, and breaking up distinct linear features created through excavation of material by reestablishing vegetative cover.

4.1.2.8 Air Quality

No direct or indirect negative effects to air quality would result from implementation of the No Action alternative. Over time, the existing RMM would be mined out and closed and reclaimed which would have a direct positive effect on air quality by reducing the amount of disturbed, open, unvegetated land, thereby reducing the amount of land susceptible to wind erosion locally and regionally.

4.1.2.9 Noise

No direct or indirect negative effects to noise would result from implementation of the No Action alternative.

4.1.2.10 Traffic

No direct or indirect negative effects to or from traffic would occur under the No Action alternative.

4.1.2.11 Forestry Resources

Under the No Action alternative, all forestry resources would remain undisturbed on BLM lands. As such, no direct or indirect negative effects to forestry resources would occur from implementation of the No Action alternative.

4.1.2.12 Human Health and Safety

Under the No Action alternative, the RMM would not extend onto BLM land. However, the RMM would continue to operate for a few years continuing to mine out the remaining reserves on CRM property. No traffic increases or operational changes would occur at the RMM or along 31-Mile Road. Also, denial of use of BLM land would not affect human health and safety at the RMM.

4.1.3 ALTERNATIVE C: LIMITED TO SOUTH OF 31-MILE ROAD

4.1.3.1 Land Tenure and Use

Land tenure and use would be directly affected by the extension of the mine onto ≈213 acres of BLM land. In the short-term, project area lands south of 31-Mile Road would be dedicated to the extraction of pumice material. Issuance of grazing permits for the Cerro Negro 537 allotment would be reduced by the amount of forage lost on the ≈213 acres. Currently, the Cerro Negro 537 allotment is not being leased. So, adjustment to the total number of stock permitted to graze would not be affected. As a result, there would be no effect to livestock or ranching operations as a result of implementing Alternative C.

BLM lands within the project area south of 31-Mile Road that provide undeveloped recreation opportunities would be affected in the short-term. The activity of mining may deter certain land uses near this area. The mine would progress through Phases 1-3 over time which may displace undeveloped recreational users. However, large amounts of land surrounding the project area are public lands which

provide the same undeveloped opportunities. The surrounding public lands would absorb any recreational use without being affected.

All areas affecting land use would be concurrently reclaimed to replace the lost form and character of the original site. The seed mix that CRM would use would be a BLM approved seed mix that would replace the plant community lost during initial stripping operations. The DIA for BLM-East south of 31-Mile Road and all of BLM-West is \approx 185 acres. Once a viable community of vegetation establishes on reclaimed areas, a land use of grazing would resume across all BLM lands.

No active negotiations for “disposal” lands within the project area are taking place and no effect would occur to any land acquisition negotiations from implementation of Alternative C.

4.1.3.2 Geology Resources

Geologic resources in the project area would be directly affected by the Proposed Action. All desirable pumice ore would be permanently removed from \approx 148 acres. The removal of pumice material and disturbance of overburden under Alternative C would result in an alteration to the areas landform creating a depressed area south of 31-Mile Road. However during concurrent reclamation, any highwalls or steep slopes would be reduced to slopes no steeper than 3 (horizontal) to 1 (vertical). This earthwork activity would stabilize project area lands and protect geologic resources adjacent to the property. Also, final reclamation would be performed to mimic the geomorphology of the existing landscape south of 31-Mile Road as illustrated in Figure 6.

4.1.3.3 Soils Resources

In the short-term, soils in the project area south of 31-Mile Road within mining blocks would be disturbed, compacted, scraped, and entirely removed. Outside of mining blocks, soils beneath roadways and stockpiles would be compacted, and buried. All topsoil would be discreetly stockpiled and interim seeded in order to maintain long-term soil viability. Over the long-term, topsoil would be spread across the surface of DIAs (185.2 acres) during final reclamation and seeded with a BLM approved seed mix.

As a result, topsoil would be impacted within the project area south of 31-Mile Road in the short-term during stripping and stockpiling. However over time, the stabilized topsoil would be reused as a seed bed during final reclamation. Therefore, a short-term negative effect to 185.2 acres (not all of which would be impacted simultaneously) of soils would occur from Alternative C but those effects would decrease as the topsoil is stockpiled, stabilized, reused, seeded, and avoided.

4.1.3.4 Water Resources

Proposed mining extension activities would alter the drainage pattern at the project site south of 31-Mile Road. There are only a few small ephemeral channels within the Alternative C project area and most drain offsite. Where possible, CRM would completely avoid direct use of drainage bottoms and channels for mining and stockpiling. There would be no releases of hazardous substances as part of mining activities. Also, Alternative C would include the construction and maintenance of MSHA approved berms across the project area which would help control surface flows. As a result, there would be no direct or indirect effects to surface or groundwater resources or water quality from implementation of Alternative C.

4.1.3.5 Biological Resources

Wildlife: No threatened, endangered, or special status wildlife species were observed within or adjacent to the project area (Black 2010). Potential habitat for 1 State of NM Threatened species, the gray vireo, was located on the proposed site.

Townsend's big-eared Bat: Given the relatively small scale of the proposed disturbance, this species should not be adversely impacted by the proposed project.

American Peregrine Falcon: Given the relatively small scale of the proposed disturbance, this species should not be adversely impacted by the proposed project.

Red Fox: Given the relatively small scale of the proposed disturbance, this species should not be adversely impacted by the proposed project.

Gray Vireo: Direct effects to nesting vireos could occur if vegetation removal is not appropriately timed. See Wildlife Mitigations below for methods that would be employed to ensure no adverse effects to vireos would occur.

Loggerhead Shrike: Given the relatively small scale of the proposed disturbance, no take is anticipated and this species should not be adversely impacted by the proposed project.

Migratory Birds: No take of migratory birds is anticipated under Alternative C and no direct effects to migratory birds would occur if vegetation removal is appropriately timed. A slight indirect effect to migratory birds would occur due to a temporary loss of habitat for species that favor those found in the project area.

Raptors: No raptor nests were located within 1 mile of the project area during surveys. Therefore, no direct or indirect effects to raptors would occur.

Other Wildlife: A slight indirect effect to wildlife would occur from the temporary loss of habitat and forage during active mining. Smaller, less mobile wildlife species may be affected more heavily than larger mobile wildlife. Small burrowing animals and any species that use the substrate for shelter may be taken during mining activities. Although individuals of a particular species may be lost, populations of non-sensitive species would not be greatly affected as a whole.

Wildlife Mitigations:

1. No tree removal associated with the proposed project would be conducted during the gray vireo or any other migratory bird nesting season (March 1-August 1).

Botany: Direct negative effects would occur in the short-term to ≈185 acres of the plant community that currently occupies the project area. Under Alternative C, all plant material would be removed and handled according to TFO guidance in order to enable stripping of overburden.

None of the 16 species listed as rare in Rio Arriba County, NM, were found in the project area during the survey. Fourteen species lacked suitable habitat and two species listed as rare in Rio Arriba County, Taos milkvetch (*Astragalus puniceus* var. *gertrudis*) and Pagosa phlox (*Phlox caryophylla*) had potential habitat but were not present (Devlin 2010). Also, there are no Federal listed plant species for Rio Arriba County, New Mexico.

Slight indirect effects to botanical resources would occur on ≈185 acres due to the temporary loss of habitat from removal of the soil substrate and burial. However, following final reclamation of the project area, earthwork and topsoil spreading would reestablish suitable habitat for a replacement plant community in the project area. Seeding would then stabilize earthwork and protect the newly replaced habitats for surrounding native plant species to expand onto.

4.1.3.6 Cultural Resources

No Traditional Cultural Properties or Native American Religious Concerns were highlighted during scoping. All sensitive cultural resources would be avoided. As a result, no direct or indirect effects to cultural resources are expected from implementation of Alternative C. However, in the event that buried cultural deposits are discovered during construction, work would cease and the Taos BLM would be notified so a qualified archaeologist may perform an evaluation of the findings.

Cultural Mitigations:

1. If undocumented cultural resources are discovered during construction and operation Alternative C, work would immediately cease and the BLM TFO archaeologist would be contacted.

4.1.3.7 Visual Resources

Direct effects to visual resources would occur from implementation of Alternative C. The mine property would extend onto an additional ≈ 213 acres. However, the total number of acres open at a single time would be limited to 3 mining blocks which would be a reduction from that currently open on CRM land. The total number of long-term year-round residential observers and short-term recreational and transient observers likely to view the project area would not change. However, the duration of visibility to travelers on 31-Mile Road depending on the stage of mine progression would increase to the south as the mine would extend along a longer section of the south side of 31-Mile Road than it does currently.

Effects to visual resources are relatively similar to those discussed under the Proposed Action; however, the total number and location of extension acres would be entirely limited to south of 31-Mile Road. Although only 3 mining blocks would be open at a given time, the operation would still be visible to the casual observer either traveling 31-Mile Road, or viewing down into the project area from above. Moderate contrasts resulting from the Proposed Action would meet Class III objectives.

The proposed mine property may be visible from various observation points; however, the level of severity of change would likely improve from that currently present. The additional vegetative cover from interim seeding on both CRM and BLM lands south of 31-Mile Road would help control dust from leaving the property. Interim seeding would also reduce the moderate contrast, lightly colored overburden stockpiles. Vegetative cover would also break up the form and line of topsoil and overburden stockpiles and above grade containment berms and reduce visibility of the mine to the casual observer traveling 31-Mile Road. For those observers viewing the project area from above (Clara Peak, Cerro Roman, 31-Mile Road on Forest Service land), the floor and highwalls of the mine would be visible and the near white color of the pumice ore would not be mitigated once uncovered. As a result, as interim seeding progresses, a reduction of open, unvegetated acreage from the current condition would occur (regardless of which 3 mining blocks are active), but the mine would still catch the attention of the casual observer from closer observation points that are adjacent to or view into the project area.

Although the overall proposed footprint of the mine would increase by ≈ 213 acres, both partial and final reclamation would occur concurrent with mining. Earthwork and contouring associated with reclamation would imitate the natural character and form of the landscape as much as possible (reducing slopes to no steeper than 3 horizontal to 1 vertical), while reseeding would further stabilize reclamation earthwork, control dust, reduce contrast, break up linear features, introduce texture, and provide additional structure.

No indirect effects to visual resources would occur from Alternative C.

Visual Mitigations:

1. All necessary above grade containment berms would be interim seeded using a BLM approved seed mix to reduce contrast and break up the linear feature and character of berms.
2. Blowing dust from the mine would be mitigated by reducing the total number of disturbed, open acres, and reseeding with a BLM approved interim or final reclamation seed mix to reduce dust emissions from disturbed open surfaces.

4.1.3.8 Air Quality

In northern New Mexico, disruption of air quality is largely a factor of winds blowing across disturbed areas and roadways, and is highly variable by time of day and season. Under Alternative C, extension of the RMM would disturb additional acreage (DIA ≈ 185 acres), but the total acreage opened at a given time would decrease. Concurrent reclamation and interim and final seeding on an established schedule would

reduce the total acreage open at a given progress point. Also, there would be less open BLM land under Alternative C than that currently present. The reduction in total disturbed acreage, concurrent reclamation, and use of interim and final seed mixes would result in substantial decreases in dust emissions from the RMM.

Production rates are not proposed to change significantly, and the RMM equipment and machinery would continue to be used as it is currently. Emissions from vehicles and equipment would remain similar to those currently occurring and would not significantly affect air quality locally or regionally. As the mine progresses, portions of the proposed mine property would be partially or entirely reclaimed which would reduce the amount of bare ground directly exposed to wind erosion.

No indirect effect to air quality would occur from Alternative C.

4.1.3.9 Noise

Noise sources proposed at the RMM would be similar to those currently emitting noise. The closest receptors to the proposed project area are on private land and the closest residence is \approx 3,400 feet from the northwest corner of BLM-West. The closest residence to the BLM-East parcel south of 31-Mile Road is \approx 7,620 feet away. Noise emissions data was not collected at the RMM. There have been no complaints regarding noise in the area and all noise emissions are limited to a maximum of 12 hours per day and only during daylight hours. Although CRM may decide to use a second crusher during mining operations on BLM land, it would only be used as necessary and would be located over $\frac{1}{2}$ mile from the nearest residential structures. It is not known whether the closest structures of interest are occupied by permanent year-round residents.

Due to the substantial distances to the nearest permanent receptors and generally limited duration of stay within the project area for most short-term or transient users, noise emissions from the RMM would not have substantial direct negative effects to permanent, short-term, or transient listeners.

No operational expansion is proposed under the Proposed Action, and because the crusher and associated machinery would operate from within a pit, very little noise would be discernible at even the closest receptor distance of \approx 3,400 feet. Shifting winds may temporarily carry noise farther than it would otherwise travel; however, the frequency and intensity of wind is quite variable and generally, frequent winds out of the west tend to carry noise away from development.

Noise emissions from mining would be at similar levels to those currently produced. Receptor standoff distances from the proposed Alternative C properties are distant enough to largely eliminate negative effects. Also, key receptor positions would likely remain geographically similar or identical to those currently near the RMM.

No animal species were identified that would be particularly susceptible to noise; therefore, no direct negative effects from noise would result from implementing Alternative C.

Under the Proposed Action, CRM would only operate the mine for a maximum of 12 hours per day and only during daylight hours. As a result, no direct or indirect effects to nighttime silence would occur.

4.1.3.10 Traffic

No direct or indirect negative effects to or from traffic would occur as a result of Alternative C. Heavy truck traffic from the RMM would not significantly increase under this alternative. CRM is not obligated to maintain 31-Mile Road and would only do so at its own discretion. However, if required, CRM may perform repair or maintenance to critically damaged or dangerous sections only to ensure that 31-Mile Road is safe for operation of haul trucks.

4.1.3.11 Forestry Resources

Forestry resources would be directly affected by Alternative C. Approximately 51 acres of piñon-juniper woodland on BLM-East south of 31-Mile Road and ≈5 acres of piñon-juniper woodland on BLM-West would be entirely removed. Certain species of migratory birds including the gray vireo may use forested habitats in the project area. To mitigate any take to nesting migratory birds, no trees would be removed from the project area from March 1 to August 1 (See Wildlife Mitigations in Section 4.1.1.5).

Under Alternative C, CRM would manage, utilize, and dispose of all BLM administered forestry materials that occupy all DIAs in the project area in accordance with all TFO Standard Operating Procedures (SOPs) and guidance.

4.1.3.12 Human Health and Safety

No direct or indirect negative effects to human health and safety would occur from Alternative C. CRM would install suitable exclusion structures at all mine access points at the south fence along 31-Mile Road to control unauthorized access to the mine. Continuous fencing and intervisible signage would also be installed along the fence south of 31-Mile Road to notify visitors of the restricted access to and hazards within the mine area. All mine personnel would be required to take regular, mandatory training in order to work and operate safely in the mine environment.

4.2 CUMULATIVE EFFECTS ANALYSIS

A cumulative impact, as defined in 40 CFR 1508.7, is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other action.

The Cumulative Impact Area (CIA) used for analysis in this EA, includes all lands within a 2.5-mile radius of the boundaries of the proposed BLM parcels.

4.2.1 CUMULATIVE ACTIONS

4.2.1.1 Past and Present Actions

Both past and present pumice mining has been conducted within the CIA on CRM land (≈141 acres), and on a small area on City of Española land (≈16 acres) in the southwest quarter of Section 33. Approximately 2.5 miles north of the RMM there is a small (≈7.9 acres) diatomaceous earth mine. The diatomaceous earth mine is located on BLM land, and is accessed from an entirely different road network than the RMM. It is not clear whether the diatomaceous mine is active or abandoned, but it is entirely disturbed, open, unvegetated land. Also, past operators of the RMM piled overburden waste onto BLM land on ≈10.1 acres immediately southwest of the RMM. CRM has already taken major steps to remove and reclaim these overburden waste piles on BLM land by completely grading and contouring ≈8.7 acres of waste piles on BLM land as well as contouring an additional ≈20+ acres on CRM land. Therefore, the total number of disturbed acres in the CIA from mining or reclamation activities is ≈175 acres. Other forms of disturbance increase this total disturbed acreage in the CIA but are not included for simplicity.

In the past, there have been a handful of pumice mining operations in the Jemez Mountains well outside the CIA; however, CRM has only ever operated the RMM. Other past actions resulting in disturbance of land in the CIA include road development, grazing, residential development, and light OHV use. Cumulatively, past and present operations of roadways, grazing, residential development, and mining in the CIA have increased the amount of open land that has been partially or entirely disturbed, resulting in increased emissions of dust, reduced habitat and forage for wildlife, and decreased habitat for plants.

Increased development in rural Rio Arriba County outside the CIA has also resulted in increased numbers of unpaved roadways and various other levels of disturbance and land clearing. At times of high wind, air

quality can be negatively affected by the combined fugitive dust emissions from all poorly stabilized or disturbed land areas as well as all unpaved roadways and other disturbed areas in Rio Arriba County.

4.2.1.2 Reasonably Foreseeable Actions

The primary reasonably foreseeable action that will reduce cumulative impacts in the CIA is the reclamation and reseeding of large areas of the ≈ 141 acres within the RMM's mining area limits, as well as ≈ 10.1 acres of waste piles on BLM land. CRM has already begun the earthwork process and intends to place seed immediately after all earthwork operations have ceased in the reclamation area. The reclamation area is on both BLM and CRM land.

Although it is appropriate to assume that future mining development near the project area will continue, only relevant components of non-speculative, reasonably foreseeable actions can be analyzed. As such, there are no pending or known future pumice, sand and gravel, or saleable mineral mines currently being permitted near the project area, nor is there any other known land use projects proposed in the CIA. If future mines are permitted, the overall disturbed and/or open acreage in the region may increase causing potential dust emissions, noise from operations, loss of habitat for plants and wildlife during active mining, and loss of forage for wildlife. Also, an increased number of vehicles and equipment mining mineral products could contribute to increases in other air pollutants such as carbon monoxide and nitrous oxides. However, because these potential future operations are speculative, the total amounts of potential pollutant and size of disturbance is speculative and cannot be estimated or properly analyzed in this EA.

4.2.2 CUMULATIVE EFFECTS

4.2.2.1 Land Tenure and Use

The total acreage of land in the CIA approved for mining would increase from ≈ 175 acres to ≈ 501 acres under the Proposed Action, or ≈ 360 acres under Alternative C. This acreage does not amount to the total disturbed acreage as some reclamation on the existing ≈ 175 acres has already been reclaimed. Also, all acres would not be opened at one time; rather, concurrent reclamation would be conducted during mining reducing the amount of open land from the current condition. A decision to permit the extension of the RMM will enable active mining in the project area to continue for ≈ 27 years under the Proposed Action, or ≈ 16.75 years under Alternative C. Land currently used for mining, grazing, transportation, and residential development will continue to have a similar land use in the future. As a result, there would only be a slight cumulative effect to land tenure and use from implementing the Proposed Action, and an even smaller effect under Alternative C.

4.2.2.2 Geology Resources

Geologic resources in the region are currently exploited by mining diatomaceous earth, pumice, and sand and gravel materials. The geologic resource of interest (pumice) is narrowly distributed, underlying limited areas on the flanks and within the caldera of the Jemez Mountains. Based on the limited quantity of desirable ore material in the region, the increased mining to ≈ 501 acres under the Proposed Action, or ≈ 360 acres under Alternative C, would result in a reduction in total ore reserves available for extraction. However, because there are several other suitable locations for extraction of pumice and other ore in the region, there would only be slight cumulative impacts to geologic resources of the region under either the Proposed Action or Alternative C.

4.2.2.3 Soils Resources

Topsoil in the project area is thin (≈ 9 inches). Although not all topsoil has been discreetly stockpiled by CRM and other operators of the RMM and other mines in the region, CRM will discreetly stockpile topsoil for use in final reclamation. Therefore, the complete removal or burial of topsoil on an additional ≈ 326 acres under the Proposed Action, and ≈ 185 acres under Alternative C, and subsequent topsoil reuse will not result in a significant cumulative effect to soils resources.

4.2.2.4 Water Resources

No cumulative effects to surface water resources are anticipated from the Proposed Action or Alternative C. There would be no diversion or discharge of water at the RMM. Although other mining operations in the region may use water, none of these operations are close to the RMM and the RMM would not contribute cumulatively to any effects to surface or groundwater resources or water quality.

4.2.2.5 Biological Resources

The increased disturbance from ≈ 175 acres to ≈ 501 acres under the Proposed Action, or ≈ 360 acres under Alternative C, would result in cumulative effects to biological resources. Plants would be completely disturbed and would not be able to establish within active areas until final reclamation is completed. However, this temporary loss of habitat would not significantly reduce the total acreage of lands in the region that provide suitable habitat characteristics for native plants and animals found at the project site. Wildlife forage would also be cumulatively reduced by an additional ≈ 236 acres (Proposed Action) or ≈ 185 acres (Alternative C) during active mining. However, not all land areas proposed for mining would be opened at one time, and concurrent reclamation would continue to close disturbed lands. Also, wildlife would have access to sizeable areas of similar forage and habitat adjacent to the project area within the CIA and would not experience significant cumulative effects from the Proposed Action or Alternative C.

4.2.2.6 Cultural Resources

No cumulative effects to cultural resources are expected from implementation of either the Proposed Action or Alternative C. No Traditional Cultural Properties or Native American Religious Concerns were highlighted during scoping. All sensitive cultural resources would be avoided.

4.2.2.7 Visual Resources

The increased disturbance from ≈ 175 acres to ≈ 501 acres under the Proposed Action, or ≈ 360 acres under Alternative C, would make the RMM and other disturbance in the CIA more apparent to casual observers. Although not all observation points within the CIA can view the RMM and surroundings, the increase in size under either alternative would result in a slight negative cumulative effect to visual resources from the increase in disturbed lands. However, CRM has already begun to close lands currently open and intends to conduct concurrent reclamation under either the Proposed Action or Alternative C. As a result, the overall contrast and form of the RMM may be slightly more apparent from certain observation points in and near the project area, or from vantages that view down into the project area and surrounding landscape until reclamation vegetation matures. From perched vantages, visibility of multiple mining areas (RMM and diatomaceous earth mine ≈ 2.5 miles north) would be readily apparent to the casual observer, but overall, the total acreage of disturbed, unvegetated areas would be reduced as CRM continues to close mined out areas and completely reclaim.

4.2.2.8 Air Quality

An increase in mining disturbance in the CIA from ≈ 175 acres currently, to ≈ 501 acres under the Proposed Action, or ≈ 360 acres under Alternative C, would partially disturb and/or completely open acreage not currently disturbed. However, disturbance would not occur on the entire acreage at the same time and CRM intends to regularly close and reclaim mining blocks to reduce the amount of lands that could cumulatively affect air quality in the region. Only those lands that remain actively disturbed would contribute to the release of fugitive dust emissions and any given mining block would only remain open for a period of a few years under either action alternative. However, windborne dust is generated from a number of sources in the region including other disturbed lands in the CIA, unpaved roadways, and past and present mining operations that were abandoned without being reclaimed. Although dust emissions may occur at times, these emissions would be controlled to the extent possible using operational controls

including interim and final reclamation reseeding on all above grade topsoil and overburden stockpiles, above grade containment berms, and all closed land that has received final contouring and grading. As a result, the cumulative effect to air quality from either action alternative is expected to be relatively small and would reduce over time as CRM closes lands within the RMM's mining area limits.

4.2.2.9 Noise

The RMM is relatively far from other noise emitting sources. No other mines exist near the project area and no operational increases are proposed that combined would greatly increase noise levels. As such, there would be no significant cumulative effect to or from noise due to implementation of the Proposed Action or Alternative C.

4.2.2.10 Traffic

Traffic will be no cumulative effects to or from traffic due to implementation of the Proposed Action or Alternative C. Mine traffic is not proposed to significantly increase. No other operations exist or are proposed on adjacent or surrounding lands, and no known proposals are being reviewed that would gain access via 31-Mile Road through the project area.

4.2.2.11 Forestry Resources

No other projects are being considered that would affect forestry resources in and near the project area. As a result, no cumulative effects to forestry resources are expected from implementation of the Proposed Action or Alternative C.

4.2.2.12 Human Health and Safety

No other projects are being considered that would affect human health and safety in and near the project area. As a result, no cumulative effects to human health and safety are expected from implementation of the Proposed Action or Alternative C.

5.0 CONSULTATION AND COORDINATION

5.1 SUMMARY OF CONSULTATION AND COORDINATION

BLM consultation and coordination activities were initiated and conducted with other agencies and entities as part of this EA. All appropriate Tribes (including Santa Clara Pueblo) and agencies were contacted during scoping in September 2010. No Tribes or agencies requested formal consultation or coordination with the TFO.

5.2 SUMMARY OF PUBLIC PARTICIPATION

On September 14, 2010, the 30-day formal public scoping period was opened. A formal scoping letter was sent out on September 14, 2010 to all appropriate agency and government contacts as well as recipients on CRM's mailing list soliciting the general public to comment on the proposed RMM extension project. The formal scoping period closed on October 14, 2010 with no public comments received. However, one request for a map of the project area was submitted by Harijot to the BLM. The requested map was delivered to Harijot shortly following the formal close of scoping and no additional comments were received.

On August 4, 2010, the proposed RMM extension project was discussed with BLM, TFO resource specialists at an interdisciplinary NEPA coordination meeting. Issues discussed included wildlife and consultation requirements on threatened and endangered (T&E) species, migratory birds, big game, traffic, water resources, site control, drainage, topsoil and waste pile management, trees as public resource, visual resources, air quality, grazing and land use, and potential alternatives to the Proposed

Action. Follow up discussions were conducted with BLM resource specialists as necessary to clarify and resolve specific issues related to the scope of this analysis.

On May 5, 2011, an additional TFO interdisciplinary meeting was held with BLM resource specialists to discuss the proposed project and relevant issues again, and the relevancy to include one alternative to the Proposed Action. BLM managers concluded that this EA must include analysis of one alternative which has been included as Alternative C.

5.2.1 PUBLIC COMMENTS ANALYSIS

This section will be completed following the 30-day public review and comment period.

5.3 LIST OF PREPARERS

The following is a list of preparers that either authored parts of the analysis, reviewed project deliverables, or provided feedback and comments during the preparation of this EA.

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Appendices:

Appendix A – Wildlife Survey Report

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Appendix B – Plant Survey Report

WILDLIFE SURVEY REPORT

FOR

CR MINERALS' PROPOSED ROCKY MOUNTAIN MINE EXTENSION

**Sections 33 and 34, T. 21 N., R. 7 E.
Rio Arriba County, New Mexico**



OCTOBER 1, 2010

PREPARED BY:

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1.0 INTRODUCTION

Threatened, endangered, and special status wildlife surveys were conducted at the proposed Rocky Mountain Mine extension properties on BLM land in Sections 33 and 34, T. 21 N., R. 7 E., Rio Arriba County, New Mexico. The proposed extension project area is located on BLM-administered surface and is approximately 380.5 acres in size. The project area is divided into two parcels, BLM-East (~349 acres) and BLM-West (~31.6 acres). The smaller BLM-West parcel is entirely located in Section 33. The larger BLM-East parcel is located in Sections 33 and 34.

2.0 METHODS

Prior to the field surveys, the following databases were reviewed:

- U.S. Fish and Wildlife Service Listed and Sensitive Species in Rio Arriba County (downloaded and reviewed September 1, 2010)
- New Mexico Department of Game and Fish BISON-M threatened, endangered, and sensitive taxa wildlife species in Rio Arriba County (downloaded and reviewed September 1, 2010)

Refer to the tables below that identify and address the species identified in these databases. Following the database review, the project area was inspected for the potential presence of threatened, endangered, or special status wildlife species.

2.1 WILDLIFE

On September 10, 12 and 16, 2010, Wildlife Biologist Charles Black conducted a pedestrian survey of the proposed site to inspect for the potential presence of threatened, endangered, or special status species. Weather during surveys was clear and warm with daytime highs around 85 F.

The area surveyed consisted of the two proposed BLM parcels. An additional 1.0-mile line-of-sight survey was conducted from the project area for raptor nests. The surveyor used 10x40 binoculars for the line-of-sight survey.

3.0 DESCRIPTION OF EXISTING HABITAT

The project area consists of ~380.5 acres of BLM land. 31-Mile Road runs through the middle of the BLM-East project area and is fenced on both the north and south side of the road. 31-Mile Road runs just north of the BLM-West parcel and is fenced at this boundary. The fenced area, including 31-Mile Road and the right-of-way, is approximately 200 feet wide and is not proposed for future mining.

Terrain throughout the project area is relatively flat to gently rolling. Vegetation is dominated by pinyon (*Pinus edulis*)-juniper (*Juniperus spp.*) woodland and open juniper savanna grassland. Dominant shrubs throughout the site are rabbitbrush (*Chrysothamnus spp.*) and broom snakeweed (*Gutierrezia sarothrae*). Elevations within the project area range from approximately 6,630 to 6,775 feet.

Existing disturbance in the project area includes the existing RMM pumice extraction operation on private lands located in Section 34. 31-Mile Road also exists and cuts across the project area to lands beyond. Grasslands throughout the project area are moderately grazed even though there are no active grazing leases in the area. There are several areas where the fence between Santa Clara Pueblo and adjacent BLM lands has fallen and this is likely the source of access for cattle found on the proposed extension properties from time to time.

4.0 THREATENED, ENDANGERED, AND SPECIAL STATUS WILDLIFE SPECIES

4.1 FEDERAL T&E, CANDIDATE, AND SPECIES OF CONCERN WITH POTENTIAL TO OCCUR

The following table contains federally listed and candidate species, that are known to or have the potential to occur in Rio Arriba County, New Mexico. The table also lists Federal Species of Concern with potential to occur within the project area.

SPECIES	STATUS*	HABITAT ASSOCIATIONS	POTENTIAL TO OCCUR**
MAMMALS			
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	SC	Arid western shrub and pine forest. Maternity colonies in mines, caves, and buildings. Sensitive to disturbance.	S
New Mexican jumping mouse (<i>Zapus hudsonius luteus</i>)	C	Found close to habitat with free-flowing water, riparian zones, or in wet meadows.	NP
Black-footed ferret (<i>Mustela nigripes</i>)	E	Open grasslands with year-round prairie dog colonies. Strongly associated with black-tailed prairie dogs.	NP
BIRDS			
American peregrine falcon (<i>Falco peregrinus anatum</i>)	SC	Rare breeders (NM) in rocky, steep cliff areas, generally near water or mesic canyons. Also migrates statewide, most often near wetland habitats	S
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	C	Extensive, mature riparian corridors.	NP
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	T	Rocky canyons in mature montane forests below 9500 feet in elevation.	NP
Interior least tern (<i>Sterna antillarum</i>)	E	Nests in small colonies on mudflats and sandbars on the lower Pecos River in Southeast New Mexico. Possible as a rare vagrant in wetland habitats Statewide.	NP
Southwestern willow flycatcher (<i>Empidonax trillii extimus</i>)	E	Breeds in dense stands of willows in riparian corridors with native riparian vegetation, usually in close proximity to surface water or saturated soil.	NP
FISH			
Rio Grande silvery minnow (<i>Hybognathus amarus</i>)	E	Inhabits variety of habitats in the Rio Grande river with shifting sand or silty bottoms.	NP
Rio Grande Cutthroat trout (<i>Oncorhynchus clarki virginalis</i>)	C	High elevation, swift-flowing free stone streams	NP

Status*

E: Endangered T: Threatened C: Candidate SC: Species of Concern

Potential to Occur**

K: Known, documented observation within project area.
 S: Habitat suitable and species suspected to occur within the project area.
 NS: Habitat suitable but species is not suspected to occur within the project area.
 NP: Habitat not present and species unlikely to occur within the project area.

4.2 STATE OF NM LISTED, CANDIDATE, AND SENSITIVE TAXA WITH POTENTIAL TO OCCUR

The following table contains State of New Mexico listed species that are known to or have the potential to occur in the project vicinity. The table also lists State of New Mexico Sensitive Taxa with potential to occur within the project area.

Species	Status*	Habitat Associations	Potential to Occur**
MAMMALS			
Spotted bat (<i>Euderma maculatum</i>)	T	This little known bat is presumed the forage in high montane habitats, > 8500.	NP
Pine Marten (<i>Martes Americana origenes</i>)	T	This member of the weasel family occurs in coniferous woodland in Northern New Mexico generally > 9000 feet	NP
Red fox (<i>Vulpes vulpes fulva</i>)	ST	This species occurs in a variety of open habitats including deserts, grasslands and prairies.	S
BIRDS			
Bald eagle (<i>Haliaeetus leucocephalus alascanus</i>)	T	In Northern New Mexico, this species migrates and winters along rivers and lakes, with large trees and snags.	NP
Gray vireo (<i>Vireo vicinior</i>)	T	Open pinyon-juniper woodland and juniper-grassland savanna	S
Loggerhead shrike (<i>Lanius ludovicianus excubitorides</i>)	ST	This species occurs in a variety of open habitats including deserts, grasslands and prairies, usually with some shrub component present	S
FISH			
Round-tailed chub (<i>Gila borusta</i>)	T	Riverine habitats	NP

Status*

E: Endangered T: Threatened C: Candidate ST: Sensitive Taxa

Potential to Occur**

K: Known, documented observation within project area.
 S: Habitat suitable and species suspected to occur within the project area.
 NS: Habitat suitable but species is not suspected to occur within the project area.
 NP: Habitat not present and species unlikely to occur within the project area.

5.0 SURVEY RESULTS AND DISCUSSION

No threatened, endangered, or special status wildlife species were observed within or adjacent to the project area during the September 10, 12 and 16, 2010 wildlife surveys.

5.1 TOWNSEND'S BIG-EARED BAT

The project site provides suitable forage habitat for Townsend's big-eared bat. This species occurs in dry grasslands and coniferous and deciduous forests. Foraging habitat includes insect-rich riparian areas, wetlands, forest edges, and open woodland. Summer day and night roosts include caves, old mines and buildings which also provide suitable hibernating sites. No bats or bat sign were observed during the survey. Given the small scale of the proposed disturbance and lack of ideal habitat in the project area, this species will not be adversely impacted by the proposed project.

5.2 AMERICAN PEREGRINE FALCON

No suitable nest structures for this raptor are present anywhere near the proposed project area. The project area is suitable migration habitat for peregrines. Given the small scale of the proposed disturbance, this species will not be adversely impacted by the proposed project.

5.3 RED FOX

The project site is suitable habitat for this nocturnal species. No fox sign or burrows were observed during surveys. It is likely that red foxes occasionally occur within the project area. Given the relatively small scale of the proposed disturbance relative to overall available habitat in the area, this species will not be adversely impacted by the proposed project.

5.4 GRAY VIREO

The project contains areas of suitable habitat for nesting gray vireos. No vireos were observed during surveys, although gray vireos generally vacate their breeding grounds by September 1. If measures outlined in the Recommendations section of this report are followed, this species will not be adversely impacted by the proposed project.

5.5 LOGGERHEAD SHRIKE

The project area contains suitable habitat for Loggerhead shrikes. Shrikes are probably a fairly common breeder and migrant in more shrubby parts of the project area. Given the relatively small scale of the proposed disturbance, no take is anticipated and this species will not be adversely impacted by the proposed project.

5.6 MIGRATORY BIRDS

Migratory birds are protected under the Migratory Bird Treaty Act. Birds protected under the Act include all common songbirds, waterfowl, shorebirds, hawks, owls, eagles, ravens, crows, native doves and pigeons, swifts, martins, swallows and others, including their body parts (feathers, plumes etc.), nests, and eggs. The Act protects migratory birds from a "take". Take is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities". A "take" does not include habitat destruction or alteration, as long as these is not a direct taking of birds, nests, eggs, or parts thereof.

Twenty-one species observed during the wildlife surveys are protected under the Migratory Bird Treaty Act. No take of migratory birds is anticipated from the proposed project.

6.0 SPECIES OBSERVED DURING THE SURVEYS

While the field visits focused on T&E species, observations of non-listed species were also noted. The following lists include all wildlife species observed:

6.1 AVIAN SPECIES OBSERVED

- Red-tailed hawk (*Buteo jamaicensis*)
- American kestrel (*Falco sparverius*)
- Mourning dove (*Zenaidura macroura*)
- Barn swallow (*Hirundo rustica*)
- Horned lark (*Eremophila alpestris*)
- Common raven (*Corvus corax*)
- Black-billed magpie (*Pica hudsonia*)
- Bewick's wren (*Thryomanes bewickii*)
- Blue-gray gnatcatcher (*Poliophtila caerulea*)
- Western scrub jay (*Aphelocoma californica*)
- Western bluebird (*Sialia mexicana*)
- American robin (*Turdus migratorius*)
- Juniper titmouse (*Baeolophus ridgwayi*)
- Yellow-rumped warbler (*Dendroica coronata*)
- Townsend's warbler (*Dendroica townsendi*)
- Spotted towhee (*Pipilo maculatus*)
- Dark-eyed junco (*Junco hyemalis*)
- Chipping sparrow (*Spizella passerina*)
- Vesper sparrow (*Pooecetes gramineus*)
- Lark sparrow (*Chondestes grammacus*)
- Pine siskin (*Carduelis pinus*)
- Western meadowlark (*Sturnella neglecta*)

6.2 MAMMALIAN SPECIES OBSERVED:

- Rocky Mountain Elk (*Cervus canadensis*)
- Mule Deer (*Odocoileus hemionus*)
- Desert cottontail (*Sylvilagus audubonii*)
- Black-tailed jackrabbit (*Lepus californicus*)
- Coyote (*Canis latrans*)

Mammalian observations tend to be from tracks, scat, and other sign.

6.3 REPTILIAN AND AMPHIBIAN SPECIES OBSERVED:

- Whiptail spp. (*Cnemidophorus spp.*)

7.0 RECOMMENDATIONS

- The project site contains sizeable area of suitable habitat for the State of New Mexico Threatened Gray Vireo. However, this is not the only migratory bird species with suitable habitat in the project area. As such, it is recommended that no tree removal associated with the proposed project be conducted during the gray vireo or any other migratory bird nesting season (March 1-August 1). If this recommendation is followed, it will ensure there will be no deliberate take of gray vireos or other protected migratory bird species.

8.0 REFERENCES

New Mexico Department of Game and Fish. BISON-M threatened, endangered, and sensitive taxa wildlife species in Rio Arriba County (downloaded and reviewed September 1, 2010) <http://www.bison-m.org/reports>.

U.S. Fish and Wildlife Service Listed and Sensitive Species in Rio Arriba County (downloaded and reviewed September 1, 2010) <http://www.fws.gov/southwest/es/NewMexico>

PLANT SURVEY REPORT

FOR

CR MINERALS' PROPOSED ROCKY MOUNTAIN MINE EXTENSION

**Sections 33 and 34, T. 21 N., R. 7 E.
Rio Arriba County, New Mexico**



NOVEMBER 6, 2010

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OF



PERMITS WEST, INC.
37 VERANO LOOP
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1.0 INTRODUCTION

This report evaluates the potential for disturbance to the following 16 plant species listed as rare for Rio Arriba County, New Mexico (NMRPTC 2007): tufted sand verbena (*Abronia bigelovii*), cyanic milkvetch (*Astragalus cyaneus*), Chaco milkvetch (*Astragalus micromerius*), Pagosa milkvetch (*Astragalus missouriensis*), Arboles milkvetch (*Astragalus oocalycis*), Taos milkvetch (*Astragalus puniceus* var. *gertrudis*), Ripley's milkvetch (*Astragalus ripleyi*), robust larkspur (*Delphinium robustum*), Heil's alpine whitlowgrass (*Draba heilii*), New Mexico stickseed (*Hackelia hirsuta*), small-headed goldenweed (*Lorandersonia microcephala*), Chama blazing star (*Mentzelia conspicua*), Pagosa phlox (*Phlox caryophylla*), Pagosa bladderpod (*Physaria pruinosa*), Arizona willow (*Salix arizonica*) and Clifford's groundsel (*Senecio cliffordii*). The potential for disturbance to Federal-listed plant species (USFWS 2010) was also evaluated.

2.0 PROJECT DESCRIPTION

The project area is located on CR Minerals Company, LLC land and on Bureau of Land Management (BLM) land approximately 6-1/2 miles west of Espanola, New Mexico, in Rio Arriba County. The proposed project consists of expanding an existing, active pumice mine. Expansion will total ≈380.5 acres. The proposed project crosses two sections (33 and 34) of T. 21 N., R. 7 E., and lies on the north and south side of 31-Mile Road about 6 miles west of the intersection of FS 144 with US 84/285. Elevations within the project area range from approximately 6,630 to 6,775 feet.

The proposed pumice mine expansion includes two areas west and east of the active mine named BLM-West and BLM-East. 31-Mile Road runs through the middle of the project area and is fenced on both the north and south side. This fenced area, including 31-Mile Road, is approximately 200 feet wide and will not be part of the proposed mine area. Other than the areas surrounding the existing mine and along the roadway, the project area traverses relatively undisturbed terrain.

The soil is a clay loam, sandy in places with areas of pumice pebbles on the surface. For the most part, there are two major plant communities: pinon-juniper/blue grama woodland (*Pinus edulis-Juniperus monosperma/Bouteloua gracilis*) and savanna grassland of the *Juniperus monosperma/bouteloua* series (according to the classification system in Dick-Peddie 2000). In both communities, the predominant shrubs and subshrubs are rubber rabbitbrush (*Chrysothamnus nauseosus*) and broom snakeweed (*Gutierrezia sarothrae*). In addition to blue grama, the predominant grasses are ring muhly (*Muhlenbergia torreyi*) and alkali sacaton (*Sporobolus airoides*). By far the most abundant forb is tarragon (*Artemisia dracunculus*). In the disturbed areas along the road and adjacent to the mine, Russian thistle (*Salsola tragus*) and cheat grass (*Bromus tectorum*) dominate.

In one area immediately west of the existing mine, the substrate is predominantly pumice rather than soil. Here there is very little grass of any species and no pinon or juniper. The predominant plant is Apache plume (*Fallugia paradoxa*).

3.0 METHODOLOGY

The proposed project area was surveyed by Winnie Devlin (Ph. D., plant physiology) from October 5 through October 9, and on October 12, 2010. The weather on all of these days was cool in the morning with temperatures warming in the afternoons with a gentle breeze that typically increased in strength in the late afternoons along with increased cloud cover.

The survey of the proposed pumice mine extension was accomplished by zigzag pedestrian transects of 40 to 50 feet in width. Although the emphasis of the survey was to inspect for listed species, all plants were identified to the extent possible in order to provide a thorough description of the environment and to note any State-listed noxious weeds (NMDA 2009) that might occur in the project area.

4.0 SURVEY RESULTS

Of the 16 species listed as rare in Rio Arriba County, NM, 14 of the species—tufted sand verbena (*Abronia bigelovii*), cyanic milkvetch (*Astragalus cyaneus*), Chaco milkvetch (*Astragalus micromerius*), Pagosa milkvetch (*Astragalus missouriensis*), Arboles milkvetch (*Astragalus oocalycis*), Ripley's milkvetch (*Astragalus ripleyi*), robust larkspur (*Delphinium robustum*), Heil's alpine whitlowgrass (*Draba heilii*), New Mexico stickseed (*Hackelia hirsuta*), small-headed goldenweed (*Lorandersonia microcephala*), Chama blazing star (*Mentzelia conspicua*), Pagosa bladderpod (*Physaria pruinosa*), Arizona willow (*Salix arizonica*) and Clifford's groundsel (*Senecio cliffordii*)—were not found during the survey due to a lack of potential habitat for any of these species in the project area.

Although there is potential habitat in the project area for the remaining two species listed as rare in Rio Arriba County, NM—Taos milkvetch (*Astragalus puniceus* var. *gertrudis*) and Pagosa phlox (*Phlox caryophylla*)—neither of these species was found during the survey.

There are no Federal listed plant species for Rio Arriba County, New Mexico.

Four State-listed noxious weed species occurred within the project area: cheatgrass (*Bromus tectorum*), Russian olive (*Elaeagnus angustifolia*), salt cedar (*Tamarix* sp.), and Siberian elm (*Ulmus pumila*). Although not abundant in the project area, cheat grass did occur along the roadside, several arroyos, and other disturbed edges. The three noxious tree species were found in erosion control features adjacent to the active mine. The erosion control features periodically hold water. The resulting damp soil is conducive to the three species. All four species are listed as Class C species, "wide-spread in the state", and for which "management decisions...should be determined at the local level, based on feasibility of control and level of infestation" (NMDA 2009).

While not officially listed as noxious weeds, tumbleweed (*Salsola tragus*) and mullein (*Verbascum thapsus*) were also found in disturbed areas.

4.1 PLANTS FOUND AT THE PROPOSED PROJECT AREA

Trees

<i>Elaeagnus angustifolia</i>	Russian olive
<i>Juniper monosperma</i>	One-seed juniper
<i>Pinus edulis</i>	Pinon pine
<i>Pinus ponderosa</i>	Ponderosa pine
<i>Populus sp.</i>	Cottonwood
<i>Salix sp.</i>	Willow
<i>Tamrix sp.</i>	Salt cedar
<i>Ulmus pumila</i>	Siberian elm

Shrubs, Subshrubs and Vines

<i>Artemisia tridentata</i>	Big leaf sagebrush
<i>Atriplex canescens</i>	Four-wing saltbush
<i>Chrysothamnus depressus</i>	Longflower rabbitbrush
<i>Chrysothamnus nauseosus</i>	Rubber rabbitbrush
<i>Clematis ligusticifolia</i>	Western virgin's bower
<i>Eriogonum microthecum</i>	Slender buckwheat
<i>Fallugia paradoxa</i>	Apache plume
<i>Forestiera neomexicana</i>	New Mexico olive
<i>Gutierrezia sarothrae</i>	Broom snakeweed
<i>Krascheninnikovia lanata</i>	Winterfat
<i>Lycium pallidum</i>	Wolfberry
<i>Rhus trilobata</i>	Skunkbush
<i>Ribes cereum</i>	Wax currant
<i>Tetradymia canescens</i>	Spineless horsebrush

Cacti and Succulents

<i>Coryphantha vivipara</i> var. <i>arizonica</i>	Arizona pincushion
<i>Cylindropuntia imbricata</i>	Cholla
<i>Echinocereus triglochidiatus</i>	Claret cup cactus
<i>Opuntia phaeacantha</i>	Pricklypear
<i>Opuntia polyacantha</i>	Plains pricklypear
<i>Yucca baccata</i>	Banana yucca
<i>Yucca glauca</i>	Soapweed yucca

Grasses

<i>Achnatherum hymenoides</i>	Indian ricegrass
<i>Aristida divaricata</i>	Poverty threeawn
<i>Aristida longiseta</i>	Red threeawn
<i>Bouteloua curtipendula</i>	Sideoats grama
<i>Bouteloua eriopoda</i>	Black grama
<i>Bouteloua hirsuta</i>	Hairy grama

<i>Bouteloua gracilis</i>	Blue grama
<i>Bromus tectorum</i>	Cheatgrass
<i>Elymus elymoides</i>	Bottlebrush squirreltail
<i>Festuca arizonica</i>	Arizona fescue
<i>Hordeum jubatum</i>	Foxtail barley
<i>Muhlenbergia torreyi</i>	Ring muhly
<i>Munroa squarosa</i>	False buffalograss
<i>Pascopyrum smithii</i>	Western wheatgrass
<i>Pleuraphis jamesii</i>	Jame's galleta
<i>Schizachyrium scoparium</i>	Little bluestem
<i>Sporobolus airoides</i>	Alkali sacaton
<i>Sporobolus cryptandrus</i>	Sand dropseed
<i>Stipa comata</i>	Needle-and-thread

Forbs

<i>Ameranthus hybridus</i>	Pigweed
<i>Ambrosia acanthicarpa</i>	Annual bursage
<i>Ambrosia psilostachya</i>	Western ragweed
<i>Arabis fendleri</i>	Fendler's arabis
<i>Artemisia dracunculus</i>	Taragon
<i>Artemisia ludoviciana</i>	Prairie sage
<i>Asclepias asperula</i>	Antelope horns milkweed
<i>Aster falcatus</i> var. <i>commutatus</i>	Heath aster
<i>Astragalus lentiginosus</i>	Beakpod milkvetch
<i>Astragalus missouriensis</i>	Missouri milkvetch
<i>Atriplex argentea</i>	Silverscale saltweed
<i>Bahia dissecta</i>	Bahia
<i>Brickellia eupatorioides</i>	False boneset
<i>Castilleja integra</i>	Foothills paintbrush
<i>Chaetopappa ericoides</i>	White aster
<i>Chamaesyce albomarginata</i>	Rattlesnake weed
<i>Chamaesyce serpyllifolia</i>	Thymeleaf spurge
<i>Chenopodium album</i>	Common lambsquarters
<i>Chenopodium berlandieri</i>	Netseed lambsquarters
<i>Chenopodium fremontii</i>	Fremont lambsquarters
<i>Chenopodium leptophyllum</i>	Narrow-leaved goosefoot
<i>Cirsium ochrocentrum</i>	Yellowspine thistle
<i>Cleome serrulata</i>	Rocky Mountain bee plant
<i>Conyza canadensis</i>	Horseweed
<i>Cryptantha crassisepala</i>	Thicksepal hiddenflower
<i>Cryptantha paysonii</i>	White hiddenflower
<i>Dalea purpurea</i>	Purple prairie clover
<i>Dalea scariosa</i>	La Joya prairieclover

<i>Descurainia obtusa</i>	Blunt tansy mustard
<i>Descurainia sophia</i>	Flixweed
<i>Dysphonia graveolens</i>	Fetid goosefoot
<i>Eriogonum cernuum</i>	Nodding buckwheat
<i>Gaillardia pinnatifida</i>	Yellow blanket flower
<i>Helianthus annuus</i>	Annual sunflower
<i>Heterotheca villosa</i>	Hairy golden aster
<i>Hymenopappus filifolius</i>	White ragweed
<i>Hymenoxis richardsonii</i>	Rubberweed
<i>Ipomopsis aggregata</i>	Skyrocket
<i>Ipomopsis laxiflora</i>	Slender trumpet gilia
<i>Lactuca serriola</i>	Prickly lettuce
<i>Lappula occidentalis</i>	Cupseeded stickseed
<i>Lepidium montanum</i>	Pepperweed
<i>Lesquerella fendleri</i>	Fendler bladderpod
<i>Linum lewisii</i>	Blue flax
<i>Machaeranthera canescens</i>	Purple aster
<i>Machaeranthera linearis</i>	Narrowleaf purple aster
<i>Machaeranthera parviflora</i>	Small-flowered tansyaster
<i>Melilotus alba</i>	White sweetclover
<i>Mentzelia multiflora</i>	Many-flowered blazing star
<i>Mirabilis linearis</i>	Narrowleaved four o'clock
<i>Mirabilis multiflora</i>	Giant four o'clock
<i>Monarda pectinata</i>	Plains pagoda plant
<i>Oenothera caespitosa</i>	Stemless evening primrose
<i>Orobanche ludoviciana</i>	Louisiana broomrape
<i>Penellia micrantha</i>	Slimleaf purple mustard
<i>Penstemon angustifolius</i>	Narrowleaf penstemon
<i>Physalis hederifolia</i>	Ivy-leaved groundcherry
<i>Physalis virginiana</i>	Virginia groundcherry
<i>Plantago patagonica</i>	Wooly plantain
<i>Portulaca oleracea</i>	Common purslane
<i>Psilostrophe tagetina</i>	Paper flower
<i>Salsola tragus</i>	Russian-thistle
<i>Senecio riddellii</i>	Riddell's groundsel
<i>Solanum heterodoxum</i>	Melonleaf nightshade
<i>Solanum sarrachoides</i>	Hairy nightshade
<i>Sphaeralcea angustifolia</i>	Narrowleaf globemallow
<i>Sphaeralcea coccinea</i>	Scarlet globemallow
<i>Sisymbrium altissimum</i>	Tumblemustard
<i>Stephanomeria pauciflora</i>	Skeleton weed
<i>Taraxacum officinalis</i>	Dandelion
<i>Thelesperma filifolium</i>	Indian tea

<i>Thelasperma megapotamicum</i>	Cota
<i>Tragapogon dubius</i>	Western salsify
<i>Verbascum thapsus</i>	Mullein
<i>Verbena bracteata</i>	Carpet-verbena
<i>Verbesina encelioides</i>	Cowpen daisy

5.0 DISCUSSION

The proposed project will not impact any State or Federal listed plant species.

6.0 REFERENCES

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