



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

August 2020

Section 7 Humate Mine Project

Environmental Assessment
DOI-BLM-NM-F010-2018-0117-EA
Applicant: Miocene, LLC

Township 19 North, Range 05 West, Section 07

McKinley County, NM

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1 Introduction

1.1 *Summary of Proposed Project*

Miocene, LLC (Miocene) has submitted a mining and reclamation plan to the Bureau of Land Management (BLM) Farmington Field Office (FFO) for the proposed “Section 7 Humate Mine Project” in McKinley County, NM. This Environmental Assessment (EA) evaluates the potential environmental impacts associated with the Proposed Action. The Proposed Action would include mining of near-surface carbonaceous shale (humate) deposits within an approximately 140-acre permit area located in McKinley County, New Mexico. Permitting of this project would involve coordinating with the New Mexico Department of Energy, Minerals, and Natural Resources – Mining and Minerals Division (EMNRD-MMD) to include the proposed 140-acre permit area within the currently operating Miocene “Brie I” Mine. Miocene proposes to conduct operations in 10-acre sequences within the proposed project area, which will be permitted through MMD as a Minimal Impact Mine (MIM) and the BLM’s approved mining and reclamation plan.

The Proposed Action area is located in Township 19 North, Range 5 West, Section 7. It is 12 miles west of US 550 and approximately 27 miles southwest of Cuba, New Mexico (see Project Location Maps- Appendix D). Other humate mines in the San Juan Basin include the “Eagle Mesa”, “Menefee”, and the “San Luis” mines, which operate in Sandoval County, with similar operations in McKinley and San Juan Counties. It is estimated that approximately 11 billion metric tons of humate resources exist within the San Juan Basin (BLM, 2011; Shoemaker and Hiss, 1974).

1.2 *Purpose and Need*

The BLM’s purpose is to respond to the mining and reclamation plan and application for a Mineral Materials Contract submitted by Miocene to mine saleable solid minerals (humate) managed by the BLM FFO.

The need for the Proposed Action is established by BLM policy, as derived from various laws such as the Mineral Leasing Act of 1920 (MLA), as amended (30 United States Code [USC] 181 et seq.); the Act of March 3, 1909 (1909 Act); the Materials Act of July 31, 1947, as amended (30 USC 601 et seq); and the Federal Land Policy and Management Act (FLPMA) of 1976 (43 USC 1701 et seq.), as amended, to make federally-managed mineral resources available for disposal and to encourage development of mineral resources to meet national, regional, and local needs.

1.3 *Decisions to Be Made*

Based on the information in this EA, the BLM FFO will decide whether to approve the mining and reclamation plan and issue a Mineral Materials Contract for the purpose of extracting humate, and if so, under what terms and conditions.

1.4 *Land Use Conformance*

The Proposed Action is in conformance with the September 2003 Farmington Resource Management Plan (RMP) with Record of Decision, as updated in December 2003 (BLM, 2003). The RMP provides guidance for managing approximately 1.4 million acres of public land and 3 million acres of subsurface minerals in all of San Juan County, most of McKinley County, western Rio Arriba County, and northwestern Sandoval County, New Mexico. The RMP designated approximately 2.59 million acres of

federal minerals open to continued oil and gas development and leasing under Standard Terms and Conditions. Specifically, the proposed action supports the following objective:

“It is the policy of the BLM to make mineral resources available for disposal and to encourage development of mineral resources to meet national, regional, and local needs, consistent with national objectives of 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 that minimizes environmental damage and provides for rehabilitation of affected lands” (BLM 2003a).

This EA incorporates by reference the information and analysis contained within the RMP. The RMP and Record of Decision (ROD) are available for review at the BLM FFO in Farmington, New Mexico or on the BLM’s ePlanning website. The proposed humate mining project would comply with known local, county, and state planning regulations and would conform to local land uses within the area.

As required by the National Environmental Policy Act (NEPA), this site-specific EA addresses resources and impacts of the Proposed Action that were not specifically addressed within the FFO’s Proposed Resource Management Plan and Final Environmental Impact Statement (PRMP/FEIS) (BLM 2003b). The Proposed Action would not conflict with any local, county, or state plans.

1.5 Relationship to Statutes, Regulations, and Other NEPA Documents

The Proposed Action conforms to the FLPMA for allowing multiple uses of public lands, and it conforms to the Public Rangelands Improvement Act (1978). The proposed project is evaluated following NEPA regulations (43 USC 4321 et seq.) and BLM guidelines for NEPA. NEPA established the policy of evaluating environmental effects of federal actions. The Council of Environmental Quality NEPA regulations are found at 40 CFR 1500-1508. BLM guidelines for NEPA are contained in the BLM NEPA Handbook (H-1790-1). The proposed project would be performed in a manner that complies with relevant regulations, as amended, for the protection of resources including cultural, paleontological, air quality, protected species, invasive species control, and hazardous materials control. These include, but are not limited to the following:

- Air Quality Control Act in New Mexico Statute (1978)
- Archaeological Resources Protection Act (ARPA; PL 96-95; 93 Stat. 721; 16 USC 470aa et seq.), as amended (PL 100-555; PL 100-588), and its regulations (36 CFR 296)
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 42 USC 9601 et seq.) and Superfund Amendments and Reauthorization Act (42 USC 11001 et seq.)
- Endangered Species Act of 1973, Section 7 (ESA; 16 USC 1531 et seq.)
- Executive Order 12898 on Environmental Justice in Minority and Low-Income Populations
- National Historic Preservation Act of 1966, Section 106 (NHPA; PL 89-665; 80 Stat.915; 16 USC 470 et seq.), as amended, and regulations (36 CFR Part 800)
- Native American Graves Protection and Repatriation Act (25 USC 3001)
- NMAC Title 20, Chapter 2 – Air Quality (Statewide)
- Paleontological Resources Preservation Act of 2009 (Sections 6301-6312 of the Omnibus Public Lands Act of 2009, 16 USC 470aaa)

1.6 *Scoping and Issues*

1.6.1 *Internal Scoping*

As part of its review of the proposed project, the BLM FFO Interdisciplinary Team (IDT) conducted internal scoping to identify potentially affected resources and land uses. The IDT meeting was originally held on September 10, 2018, with a follow-up meeting on May 27, 2019. The IDT Checklist (Appendix G) provides a list of the issues that were considered, along with the rationale for further analysis or dismissal from further analysis in this EA.

1.6.2 *External Scoping*

A BLM on-site visit occurred on May 6, 2016 for the Section 7 Exploration Project in conjunction with the project proponent and Marron surveyors, and another on-site visit occurred October 11th, 2018 for the proposed Section 7 Humate Mine Project in conjunction with Miocene representatives. Table 1.1 lists individuals and groups invited to the onsite meetings.

Table 1.1. Individuals and groups invited to the onsite meeting.

Name	Group
Staff	BLM FFO
Staff	EMNRD-MMD
Staff	Marron
Staff	Miocene, LLC

The BLM FFO initiated external scoping for the proposed project by posting the Proposed Action on the BLM National NEPA Register ePlanning website (BLM 2019c) for a 10-day public scoping period beginning July 8, 2020. This listing included a description of the Proposed Action and a description of the proposed project location.

On August 7, 2020 the FFO conducted a 30 day public comment period on the draft EA, Finding of No Significant Impact (FONSI) and Decision Record (DR) by posting the project to the BLM ePlanning website (BLM 2019c).

1.7 *Issues Identified for Analysis*

During the scoping process, the BLM FFO developed a list of issues to analyze in detail within this EA (Table 1.2). The issue statements and impact indicators for each issue listed in Table 1.2 are used to describe the affected environment, measure change resulting from the alternatives, and assess cumulative impacts. The following resources were identified to be addressed in this document: 1) air quality.

Table 1.2. Issues Identified for Detailed Analysis

Issue Number	Issue Statement	Impact Indicator
Issue 1	How would construction and operation activities of the Humate Mine affect the VOCs and NAAQS in the Farmington Field Office?	Emissions

1.8 Issues Identified but Eliminated from Further Analysis

As described in Section 1.7, scoping was utilized to determine which issues require detailed analysis in this EA. Table 1.3, below, includes a detailed explanation of remaining issues that were discussed, but will not be further analyzed in this EA. A checklist summarizing the BLM FFO’s NEPA Interdisciplinary Team (IDT) discussions for all other land uses is included in Appendix G.

Table 1.3. Issues Identified but Eliminated from Detailed Analysis

Issue Statement	Rationale for Not Further Discussing in Detail in the EA
How would construction, drilling and completion activities associated with the Proposed Action contribute to greenhouse gas (GHG) emissions?	The standard phases of humate development include construction of the access road and initial mining area, active mining and transport operations, and reclamation of mined-out areas. Based on past salable development, the BLM has determined that the mining of salable minerals (such as humate) could emit approximately 761 metric tons carbon dioxide equivalent (CO ₂ e) (BLM 2015) over the predicted 10-year life of the mine. If the entire 140-acre permit area were developed, GHG emissions are estimated to be 2,663 metric tons CO ₂ e over an approximate 35-year mine life. Emissions associated with the proposed project are expected to occur year-round during the life of the mine since active mining requires use of heavy equipment and haul trucks and is proposed to operate 5 days a week except in times of inclement weather or on holidays. Emissions from humate production would result from mining and reclamation operations (exhaust and fugitive dust); mine site visits associated with inspection and maintenance; and water truck and haul truck traffic. Emissions associated with the proposed project on a year-to-year basis would increase GHG emissions by 0.0000012% when compared to 2016 nation-wide emissions of 6,511 million metric tons (MMT) (EPA 2018b).
How would proposed ground-disturbing mining activities impact cultural resources?	There are no Chaco Culture Archaeological Protection Sites or United Nations Educational, Scientific and Cultural Organization World Heritage Sites within or near the proposed project area. A Class III Archaeological Survey (NMCRIS No. 135810; BLM Report No. 2017(I)003F) was conducted for the proposed project. A Class III Archaeological Survey (NMCRIS No. 135810; BLM Report No. 2017(I)003F) was conducted in the proposed project area and during this survey three archaeological sites were discovered. Two of these sites (LA185556, & LA185558) were determined to be Eligible for listing on the NRHP, and one site (LA185557) was determined to be Not Eligible for listing on the NRHP. Both of the Eligible sites will be protected by temporary fencing and archaeological monitoring and the Not Eligible site will require no further work. With the adherence of these stipulations, the proposed project will have no effect on historic properties.

Issue Statement	Rationale for Not Further Discussing in Detail in the EA
How would proposed ground-disturbing mining activities impact Native American religious concerns or other concerns?	There are no known TCPs within the project boundaries being directly impacted, nor are there any indirect impacts from the mining operations to any surrounding known TCPs. Results of the Section 106 consultation and Government-to-Government consultation did not provide any new information to be included in analysis. While the entire landscape may be considered of cultural significance and this resource can therefore not be eliminated, no quantifiable impacts to religious concerns are anticipated from the development of the proposed action.
How would proposed ground-disturbing mining activities impact paleontological resources?	<p>The proposed action area is within an area classified as Potential Fossil Yield Classification 5, which means that paleontological resource occurrences are possible based on the geologic formation exposed at the surface. Additionally, paleontological resources are normally encountered within badlands soil types, which occur throughout the FFO management area. The proposed project would be in compliance with the Paleontological Resources Preservation Act of 2009.</p> <p>The area was surveyed by paleontologist Robert M Sullivan, PhD on May 11, 2016 under BLM Paleontological Resources Use Permit NM14-08C. Petrified wood and other poorly preserved fossil plant material was identified, but no vertebrate or invertebrate fossils or trace fossils were found. Appendix E contains the findings letter from the survey. Due to the lack of significant paleontological resources identified in the area, no impacts would occur outside of the displacement of insignificant fossils from mining activity. An accidental discovery stipulation would be applied to the project, if approved, to mitigate impacts to any buried paleontological resources.</p>
How would proposed mining activities impact range improvements and livestock mobility associated with the existing allotment within the proposed project area?	The proposed action area is located within the 129,773-acre Star Lake Community Allotment (No. 06023), which is managed on behalf of the BLM by the BIA and provides 8,597 animal unit months of forage. The proposed project would disturb less than 10 acres at one time under the mine plan, with initial planned disturbance of 40 acres, which is less than 0.03% of the allotment's acreage. The overall mine project area is 140 acres, which accounts for 0.11% of the allotment's total acreage. The proposed project would not directly impact any existing range improvements or long-term trend plots. The proposed mine proposal would minimize impacts to grazing by allowing grazing on the permit area that is undisturbed, construction of berms and/or fencing areas that are actively being mined to discourage livestock from entering the area, and using concurrent reclamation to re-vegetate the area as quickly as possible. The impacts to grazing under the Proposed Action would be minimal and would not result in a change to the management of the Star Lake Community Allotment, no further analysis is necessary.
How would vegetation removal and increased noise during proposed mining activities impact suitable foraging and nesting habitat for migratory birds?	The proposed action area contains minimal migratory bird nesting and foraging habitat that could be disturbed by the proposed surface mine. Noise from equipment associated with project activities could impact birds in the immediate area, but the effects would be minimal due to lack of habitat and design features included in the proposed action which mitigate noise.
How would vegetation removal and increased noise during proposed mining activities impact wildlife (aside from migratory birds)?	Approximately 40 acres of potential wildlife habitat would be removed during proposed ground-clearing activities which will take place over approximately 10 years, with 140 acres included in the entire mine site over the life of the mine which is anticipated at 35 years. Additionally, noise associated with project activities could impact wildlife species in the area. However, the proposed project area is not located within a wildlife SDA, and no known populations of big game species are present in the project area. Fencing around the active mine area and slope grading criteria are included in the proposed action and negate the need for specific mitigation measures and detailed analysis.

Issue Statement	Rationale for Not Further Discussing in Detail in the EA
How would vegetation removal and increased noise during proposed mining activities impact federally listed threatened, endangered, and candidate species?	The biological contractor performed a biological survey which was reviewed by the BLM FFO of the proposed project area in July 2016. The results of the survey showed that the proposed project area does not contain habitat for any federally listed species. Further detailed analysis is not warranted. The proposed project would be in compliance with the ESA and with the PRMP/FEIS and associated Biological Assessment (BA; BLM 2002).
How would vegetation removal and increased noise during proposed mining activities impact non-federal special-status species?	The biological contractor performed a biological survey which was reviewed by the BLM FFO of the proposed project area in July 2016. The proposed project area is not within any known special status species habitat, and no habitat or individuals were identified during the 2016 survey; no impacts are anticipated as a result of the proposed action.
How would proposed project activities and surface disturbance/presence of facilities impact the viewshed in the region?	The proposed action is within Visual Resource Management (VRM) Class IV (Class I allows the least modification, while Class IV allows the most) as prescribed and analyzed in the PRMP/FEIS (BLM 2003b), as amended. Within VRM Class IV areas, the level of change to the landscape can be high, and management activities may dominate the view and be the major focus of attention. The proposed project would be compatible with this VRM Class.
What is the potential for the spread of noxious weeds and invasive plants as a result of the proposed project?	The proposed mine would disturb approximately 40 acres in the initial mine plan, with up to 140-acres included in the permit area. Mining would occur in blocks with a maximum size of 10 acres disturbed at a time with concurrent reclamation practices included as a portion of the proposed action. Ground disturbing activity of any kind could encourage the spread of noxious weeds and invasive species within the project area that thrive in disturbed soil. Project design features related to control of noxious weeds or invasive plants (detailed in Appendix D of the EA) would mitigate the spread of weeds to the degree that detailed analysis is not warranted. The proposed project would be in compliance with the Federal Noxious Weed Act and New Mexico EO 00-22.
What vegetation impacts would occur as a result of proposed ground-disturbing activities?	The BLM FFO manages approximately 435,500 acres within the Great Basin desert scrub plant community (BLM 2003b). The proposed project, which would result in the clearing of up to 40 acres of sagebrush shrubland (which is part of the Great Basin desert scrub plant community), would impact less than 0.01% of this community within the BLM FFO. The mine proposal, which includes disturbances of less than 10-acres at a time and concurrent reclamation of mined-out areas would ensure vegetation re-growth occurs as quickly as possible. If the entire 140-acre mine permit area is developed, the vegetation removal would equate to approximately 0.03% of the plant community. With concurrent reclamation proposed in the mine plan (Appendix D), impacts to vegetation are not expected to exceed 10 acres at one time. No further analysis is necessary.

Issue Statement	Rationale for Not Further Discussing in Detail in the EA
<p>What are the potential impacts to socioeconomics that are likely to occur as a result of approving the proposed action?</p>	<p>In general, socioeconomic impacts are cumulative. The mining industries have been a substantial contributor to the social setting and economic basis of the San Juan Basin for decades. While the act of developing a single mine expansion of 40 acres over approximately 35 years, with an initial plan to mine 40 acres over 10 years, would not result in direct social impacts, subsequent development of adjacent other mines with increased humate production may generate impacts on communities and individuals in the vicinity of the proposed action with greater exploration and production of solid mineral resources. Potential impacts could include employment opportunities related to the mining and service support industries in the region, as well as impacts on federal, state, and county governments related to taxes, and other revenue streams.</p> <p>Mining development may contribute to employment for area residents, as continued demand for humate related goods and services, create new opportunities that did not exist before. This continued demand may contribute to stability in employment in sectors outside of the oil and gas industry which has been in decline in recent years and is the dominant industry in the San Juan Basin. To the extent that additional mining development impacts affect recreational and tourism opportunities around the proposed action, there may be related impacts in these economic sectors. Continued expansion of the oil and gas and mining industries may be perceived as having a negative effect on quality-of-life considerations for people who value undeveloped landscapes, opportunities for isolation, and activities such as wildlife viewing and cattle ranching.</p>

What are the future potential impacts to environmental justice communities from the development of the proposed action?

Environmental justice refers to the fair treatment and meaningful involvement of people of all races, cultures, and incomes with respect to the development, implementation, and enforcement of environmental laws, regulations, programs, and policies (CEQ 1997). Before determining if an environmental justice (EJ) population of concern is present, the BLM must first determine the area of analysis for the issue. The proposed mine expansion is located in McKinley County, New Mexico. McKinley is the area of analysis for determining presence or absence of EJ populations of concern. An analysis of the demographic data for McKinley County revealed the presence of o EJ population of concern.

McKinley County has an American Indian population that comprises more than 79% of the County’s total population and is also 50% higher than the Hispanic or Latino population in the same area, which was used as the comparison population (see Demographic Data table below). There were no other EJ populations of concern identified in the analysis area.

Demographic data for McKinley County, New Mexico

Population Totals (2017)*	McKinley County, NM	State of New Mexico
Total Population	71,367	2,084,828
Hispanic or Latino (% of total)	14.2%	1,004,103 (48.2%)
White alone (% of total)	16.3%	1,547,843 (74.2%)
Black or African American alone (% of total)	.7%	42,187 (2.0%)
American Indian alone (% of total)	79.6%	197,191 (9.5%)
Asian alone (% of total)	1.1%	29,991 (1.4%)
Native Hawaiian and other Pacific Islander alone (% of total)	.1%	1,390 (0.1%)
People with income below poverty level	32.3%	420,293 (20.6%)

Source: U.S. Census Bureau American Community Survey (U.S. Census Bureau as of July 1, 2019(V21019)) 5-year estimates used.

*2017 represents average characteristics from 2013–2017.

Given the above data, the BLM concludes that there is a minority population of concern (or “Environmental Justice Population”), defined under Executive Order 12898, in McKinley County but this population is not anticipated to be negatively impacted by the proposed action as described in Chapter 2.

Under the Proposed Action, the BLM would allow the applicant to develop the Section 7 Humate Mine. This could result in future development that may decrease quality-of-life–related values, including clean air, water, noise, visual resources, traffic, safety, and fragmentation of habitable areas and otherwise have EJ-related effects. The disturbance related to the development of the Humate Mine is similar to that of a single oil and gas well. Potential impacts on quality of life for EJ population are based on the issues analyzed in this EA and is generally limited to air quality and dust related impacts. As noted in the air quality analysis, while air quality is a regional resource and is felt by all communities in the area encompassed by the Proposed Action and development within the area; fugitive dust (PM_{2.5} or PM₁₀) impacts would be felt more by the local residents, which may be part of an EJ population. However, impacts would be localized and temporary, and overall emissions are not expected to appreciably affect contribute to any exceedance of NAAQ in Rio Arriba County. Groundwater resources are regional in nature thus affect EJ and non-EJ populations equally; moreover, the water demand from the future potential development of the nominated parcel accounts for less than 0.001% of total 2015 surface and groundwater demand in the San Juan Basin.

The determination of potential adverse and disproportionate impacts from specific actions are the assessment of the BLM and should not be assumed to incorporate the position of specific,

Issue Statement	Rationale for Not Further Discussing in Detail in the EA
How would the proposed mine project and associated surface disturbance impact the quality and quantity of surface water and groundwater sources?	<p>potentially impacted, EJ populations. The BLM will continue to work with affected EJ populations to identify and address additional EJ issues as they arise.</p> <p>The eastern portion of the proposed project area contains an ephemeral waterway, Salazar wash, which as a tributary, eventually meets the Rio Puerco. Salazar Wash is within a FEMA mapped 100-year floodplain; the remainder of the project area is within a FEMA mapped 500-year floodplain. Water is only present in the wash following storm events, where the wash is subject to large scouring flows for limited time periods. The proposed action would avoid Salazar wash entirely and use a 50-foot buffer for any mine activity. The mine plan includes a design feature that says no vehicle travel, exploratory drilling, or surface mining would occur within the wash, eliminating any potential impacts to surface water sources. This would also be included as a condition of approval if the project is approved.</p> <p>The proposed mine is located in the Middle Rio Grande Underground Water Basin, east of the Continental Divide (New Mexico Office of the State Engineer [NMOSE], 2005). The NMOSE Water Rights Reporting System (WRRS) database does not contain data regarding average depth to groundwater for the immediate project area, but NRCS soil data indicate that ground water would occur at depths greater than 80 feet (NMOSE, 2016; NRCS, 2016a). Fuel and lubricants would be supplied as needed from a service truck, which would be temporarily stored on site during mining (Appendix D). As required under the Clean Water Act, a SWPPP and NPDES permit for the project would be obtained by the operator, if the project is approved. Actual water use by the mining operation is expected to be minor, the only proposed use is for dust suppression which would be applied via truck-mounted sprayers when conditions warrant the application. It is assumed that application would occur during 6 months of the year when conditions are dry, and would be applied to the access road (up to 1.25 acres), staging area (up to 0.5 acres) and material stockpiles (up to 2 acres). The total area to be managed for dust is estimated to be 2.75 acres. With an application rate of 1,068 gallons per acre (equivalent to 1 liter per square meter), 2.75 acres would require approximately 2,937 gallons of water for dust suppression application. If the mine area is sprayed once a month for 6 months, dust suppression for the mine would utilize approximately 17,622 gallons of water per year, or 0.054 acre-feet. Water use in the New Mexico portion of the San Juan Basin in 2015 was estimated at 486,660 acre-feet (15% of total New Mexico water use), with 11,658 acre-feet used in mining (Dieter et al. 2018). The proposed action would comprise an increase of 0.00046% of water use for mining and an increase of 0.000011% of water use for the New Mexico portion of the San Juan Basin.</p>
How would activities associated with the proposed project impact public access to BLM lands (for uses such as hunting, fishing, shooting, etc.)?	<p>While public access roads are present in the immediate area and would be used by personnel during all phases of the proposed project, access to the public would not be restricted. The presence of the proposed surface mine site would limit access to the area due to safety needs for an active mine site, however existing use in the area is limited due to low population density, therefore, detailed analysis is not warranted.</p>

Issue Statement	Rationale for Not Further Discussing in Detail in the EA
How would the construction and operation phases of the proposed project impact public health and safety?	<p>The proposed humate mine expansion is generally located in a remote area with limited public visitation in the general vicinity of the communities of Ojo Encino and Cuba, New Mexico. The proposed location is not adjacent to any current residence located on private or allotted surface. Potential public health and safety risks associated with the development of the proposed action include occasional fire starts from equipment; traffic congestion and collisions from commercial vehicles and heavy use; increased levels of fugitive dust (PM₁₀). When authorizing development, Federal and state laws, regulations, and policy are applied to reduce effects or respond to incidents. These include:</p> <ol style="list-style-type: none"> 1. Federal, state, county and municipal fire managers coordinate on fire response and mitigation. 2. Developers installing and operating mining facilities and roads would be responsible for complying with the applicable laws and regulations governing hazardous materials and following all hazardous spill response plans and stipulations. 3. All mine areas, vehicles, and other workplaces must comply with worker safety laws as stipulated by the Occupational Safety and Health Administration (OSHA). Vehicular traffic and pipelines are regulated according to safety laws as stipulated by the Department of Transportation. 4. All mineral material mining operations are subject to BLM terms and conditions, as described under 43 CFR 3600. <p>The development on the proposed humate mine is similar in impacts and size to a single oil and gas well pad each year. When put into this context, the potential health and safety impact to communities would create an increase of 0.00002%, when compared to the existing risk from the current 37,300 oil and gas wells in the San Juan Basin. This incremental addition would in a small way increase risks to safety and human health within the San Juan Basin.</p> <p>No formal human health assessment for past, present, or future development has been performed. Ongoing and future development would continue to present cumulative risks to human health as detailed above. When wells reach the end of their useful life and are properly plugged and reclaimed, they would no longer contribute to these effects.</p> <p>Public roads in the area would be utilized to access the project area by employees and haul trucks to transport material from the mine site to the processing plant near Cuba, NM. The area surrounding Section 7 is remote and sparsely populated. Pipeline Road, a gravel base road is used by residents, oil and gas employees for pipeline inspection and maintenance, and conveyance between New Mexico Highway 197, Ojo Encino, Thoreau, and Grants, New Mexico. The mining operation is expected to have two-to-seven haul trips/day transporting humate from the mine to customers in the surrounding area during the active mining season during the dry months of the year. Light trucks will be used for transport of employees to and from the site. Trucks will travel from the mine to Service Route 471, then to Cuba, NM on NM-197. The proposed mine would not result in a net increase in truck traffic over current Miocene operations, as existing mine site reserves are limited, and production is planned to be replaced by the Proposed Action.</p>

2 Alternatives

2.1 *Alternative 1 – Proposed Action Alternative*

The Proposed Action for the BLM FFO is to approve to the mining and reclamation plan and application for a Mineral Materials Contract submitted by Miocene, LLC. to conduct surface mining of humate deposits by mining individual areas less than 10 acres at one time within the 140-acre permit located in

McKinley County, New Mexico. As humate resources were found to be economically viable for extraction during the Section 7 Humate Exploration Project, a mining and reclamation has been completed and submitted to the BLM FFO for review and approval (Appendix D). Subsequently, the applicant would enter a Mineral Materials Sales Contract with the BLM FFO for the extraction and sale of humate from the project area.

Miocene would establish, operate, and eventually abandon the surface mining operation following the Minimum Impact Mining methods as proposed in their Mining and Reclamation Plan. The proposed mine plan follows a sequence of approximately 10-acre disturbances throughout the mine area, with reclamation occurring between new mining disturbances. Annual production is expected to be approximately 5,000-15,000 tons per year.

The proposed project area is located in Township 19 North, Range 5 West, Section 7 on the Star Lake, New Mexico (Photo revised 1989) US Geological Survey (USGS) 7.5-minute topographic map. It is adjacent to Pipeline Road, 12 miles west of US 550 and approximately 27 miles southwest of Cuba, New Mexico (Appendix A). The Star Lake community is approximately 2.7 miles west of the project area.

Access to the proposed project area would be from the existing Brie I Mine located in Township 19N, Range 6W, Section 12 via Pipeline Road. Equipment to be used during mining operations would include a front-end loader, dozer, and excavator. Mining would occur in 10-acre sequences whereby topsoil and overburden are stockpiled and humate is extracted. Humate occurs either at the surface or in the shallow subsurface.

2.1.1 Construction of Access Road and Initial Mining Area

Prior to construction, the proposed project area would be staked to ensure that all activity would be confined to authorized areas. Staking would be maintained for the duration of construction activities.

Access the mine will be constructed to Section 7 from the pre-existing Brie I Mine (permit number MK039MN) site on Section 12, Township 19N, Range 6W west of the proposed PA. The mining boundary, including a setback inside the Section 7 boundary, will be delineated in the field using six-foot metal t-posts with four strand wire. The lower wire strand will not be barbed for wildlife protection. Boundary markers disturbed during mining operations will be replaced. Under no circumstances will the area outside the fenced boundary be disturbed. Fence maintenance will be part of routine operations.

Up to 0.5 acre will be established for a staging area. Up to two-acres will be established for stockpiles though stockpiles are anticipated to occupy a much smaller area. The staging area will accommodate personnel, vehicles, and heavy equipment and store materials and supplies. The stockpile area will accommodate mulch, topsoil, overburden, and humate. Stockpile areas will be positioned to mitigate visual impacts. As mining and reclamation progresses, the staging, stockpile, and laydown areas will migrate with mining operations.

2.1.2 Mining Operations

The Mining operations will advance in approximately 10-acre increments as mining progresses through Section 7. The following approach applies throughout mining operations and within each individual mining area Equipment to be used during mining operations would include a front-end loader, dozer, and excavator. Vegetation, roots, and organic debris will be removed from the surface and stockpiled for reuse as mulch during reclamation. Cleared vegetation, roots, and organic debris will be segregated from topsoil and overburden. Clearing and grubbing operations will occur in increments with each mining phase. Topsoil and overburden will be removed and stockpiled for reuse during reclamation. Topsoil will be

segregated and stored separately from overburden. Topsoil and overburden will be removed in increments within each mining phase. Humate will be extracted and stockpiled using a track hoe or front-end loader. The working face may be near vertical at times, a temporary feature only, as extraction of humate moves from one area of the excavation to the next. Stockpiled material will be loaded into 20-ton trucks for transport to customers. Production rates will depend on access road and excavation conditions, weather, and material demand. Weight will be recorded for each load that leaves the site by means of truck scales provided by the processing facility. Copies of all records will be kept at the processing facility.

2.1.3 Mining and Reclamation of Successive 10-acre Mining Areas

Mining is expected to occur in an orderly manner, from one mining sequence to the next. Reclamation of successive mine areas will be conducted when humate reserves have been exhausted. Reclamation will consist of backfilling, contouring, and revegetation of all mined, stockpile, staging, and laydown areas. All effort will be applied to minimize slope gradients and to apply mulch from the existing stockpile to mitigate erosion. Periodic monitoring of the reclaimed area for vegetative success will begin upon completion of the reclamation effort and include each successively mined area as each is reclaimed. Mining will commence with the initial mine area. Progression of mining to successive areas within the area is expected as reserves are exhausted and mining progresses.

Access roads within the area will be judiciously planned to capture future mining areas within Section 7 with minimal relocation or realignment. Reclamation of mined areas and access roads will be implemented at the end of each mining area operation. Mine reclamation will be made part of mine operations as mining progresses from one mine area to the next. This “real-time” reclamation concept will permit efficient monitoring of improvements and vegetative growth by operations personnel.

2.2 Alternative 2 – No Action Alternative

Under this alternative, the BLM would deny Miocene, LLC access to BLM-managed lands for the purpose of mining humate. Existing management of the lands that are covered in the Proposed Action would continue as-is. The No Action Alternative is presented as the baseline for impacts analysis in Chapter 3 (Affected Environment and Environmental Consequences). The No Action Alternative does not preclude the proposed approximate 140-acre permit area from being considered for future projects by the BLM FFO.

3 Affected Environment and Environmental Consequences

This chapter describes existing conditions relevant to the issues presented in Table 1.2 and discloses the potential direct, indirect, and cumulative impacts of the Proposed Action and alternatives.

3.1 *How would construction and operation activities of the Humate Mine affect the VOCs and NAAQS in the Farmington Field Office?*

3.1.1 *Affected Environment*

Air quality is determined by the quantity and chemistry of atmospheric pollutants in consideration of meteorological factors (i.e., weather patterns) and topography, both of which influence the dispersion and concentration of those pollutants. The analysis area for impacts on air quality consists of San Juan, Sandoval, Rio Arriba, and McKinley Counties. This spatial scope of analysis was identified based on the regional nature of air pollution and to facilitate analysis using the best available air quality data, which are generally provided at the county level. Much of the information referenced in this section is incorporated by reference from the *Air Resources Technical Report for Oil and Gas Development: New Mexico, Oklahoma, Texas, and Kansas* (herein referred to as Air Resources Technical Report; BLM 2018a).

3.1.1.1 NATIONAL AMBIENT AIR QUALITY STANDARDS

The CAA requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. Primary standards provide public health protection, and secondary standards provide for public welfare, including protection against degraded visibility and damage to animals, crops, vegetation, and buildings (EPA 2019a). The primary NAAQS are set at a level to protect public health, including the health of at-risk populations, with an adequate margin of safety (EPA 2019a). The EPA has set NAAQS for seven principal pollutants (“criteria” air pollutants): carbon monoxide (CO); nitrogen dioxide (NO₂); ozone (O₃); particulate matter equal to or less than 10 microns in diameter (PM₁₀); particulate matter equal to or less than 2.5 microns in diameter (PM_{2.5}); sulfur dioxide (SO₂); and lead (Pb). The EPA has delegated the responsibility of regulation and enforcement of the NAAQS to the state level and has approved the New Mexico State Implementation Plan (SIP), which allows the State to enforce both the New Mexico Ambient Air Quality Standards (NMAAQS) and the NAAQS on all public and private lands with the exception of tribal lands and lands within Bernalillo County. The New Mexico Environment Department (NMED) Air Quality Bureau is responsible for implementation of the SIP and enforcement of air quality standards.

Areas that are in attainment of the NAAQS are categorized as either Class I, Class II, or Class III, which determines the increment of air quality deterioration allowed. All areas that attain the NAAQS and are not specifically designated as Class I areas under the CAA are considered to be Class II for air quality, where a moderate amount of degradation is permitted. The analysis area is in attainment for the NAAQS and the NMAAQS and is categorized as a Class II area (EPA 2019b; NMED 2018).

Design Values are statistics that describe the air quality in a certain area relative to the NAAQS; they are to be consistent with NAAQS as defined in 40 CFR 50. Design Values are generally used to classify and designate non-attainment areas (EPA 2019b). The measurement parameters for each air monitor vary depending on the criteria pollutant being monitored, the scale at which that pollutant is being measured, the duration and frequency of the monitoring sample, and the monitor objective. CAA regulations establish design criteria for ambient air quality monitoring networks (also known as state and local air monitoring stations), including “scales of representativeness of most interest” for monitoring sites, ranging from national and global scales down to the local level (EPA 2012). Table 3.1 summarizes the Design Value concentrations of criteria pollutants within the analysis area, compared with the NAAQS and NMAAQS. The counties in the analysis area do not currently monitor for CO, Pb, or PM_{2.5}; however, because the counties are relatively rural in character, it is likely that these pollutants are not elevated.

Table 3.1. Design Values for Counties within the Analysis Area

Pollutant	2018 Design Concentrations	Averaging Time	NAAQS	NMAAQS
O ₃	Rio Arriba County: 0.067 ppm Sandoval County: 0.068 ppm San Juan County: 0.070 ppm, 3 stations; Bloomfield at 0.069 ppm, Navajo Dam at 0.070 ppm, Shiprock at 0.069 ppm	8-hour	0.070 ppm ^a	–
NO ₂	San Juan County: 3 stations; Bloomfield at 10 ppb, Navajo Dam at 6 ppb, Shiprock at 3 ppb	Annual	53 ppb ^b	50 ppb
NO ₂	San Juan County: Bloomfield at 34 ppb	1-hour	100 ppb ^c	–
SO ₂	San Juan County: 2 ppb	1-hour	75 ppb ^d	–
PM _{2.5}	San Juan County: Invalid monitor data ^f	Annual	60 µg/m ³ ^{e, f}	– ^g
PM ₁₀	San Juan County: Invalid monitor data	24-hour	35 µg/m ³ ^c	– ^g

Source: EPA (2019b)

Notes: ppm = parts per million, ppb = parts per billion, µg/m = micrograms per cubic meter

^a Annual fourth highest daily maximum 8-hour concentration, averaged over 3 years.

^b Not to be exceeded during the year.

^c 98th percentile, averaged over 3 years.

^d 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.

^e Annual mean averaged over 3 years.

^f PM_{2.5} monitor stations currently show installed locations in the planning area (San Juan County); however, the monitor status of these stations show invalid data and cannot be used to represent design values.

^g The NMAAQS standard for total suspended particulates, which was used as a comparison with PM₁₀ and PM_{2.5}, was repealed as of November 30, 2018.

^h While there are no NAAQS for hydrogen sulfide (H₂S), New Mexico has set a 1-hour standard for H₂S at 0.010 ppm for all areas of the state outside of the area within 5 miles of the Pecos-Permian Air Quality Control Region (BLM 2018a).

Ozone, Nitrogen Oxides, and Volatile Organic Compounds

Ozone (O₃) is a criteria pollutant that is of most concern for the analysis area. Breathing O₃ can have human health impacts, particularly for sensitive groups (children, the elderly, and those with chronic lung conditions like bronchitis, emphysema, and asthma), as well as sensitive vegetation (NMED 2019a). O₃ is most likely to reach unhealthy levels on hot, sunny days in urban environments and can be transported long distances by wind into rural areas (EPA 2019c). As a secondary pollutant, O₃ is not a direct emission pollutant (that is, it is not emitted directly into the air), but it is the result of chemical reactions between a group of highly reactive gases called nitrogen oxide(s) (NO_x) and volatile organic compounds (VOCs), which are organic compounds that vaporize (i.e., become a gas) at room temperature when exposed to sunlight (EPA 2019c). O₃ and NO₂ are criteria air pollutants and therefore are regulated under the NAAQS and NMAAQS; VOCs are not regulated, however, because O₃ is not a direct emission; emissions of NO_x (particularly NO₂, which is used as an indicator for the larger group of gases) and VOCs are used as a proxy for determining potential levels of secondary formation of O₃. NO_x can also react with other chemicals in the air to form particulate matter, contributing to haze (EPA 2019c). Major sources of emission for both NO_x and VOCs include industrial facilities like power plants and motor vehicle exhaust (including off-road equipment). NO_x is primarily emitted through fossil fuel combustion in electric utilities, high-temperature operations at other industrial sources, and the operation of motor vehicles (EPA 2019c). VOCs are emitted from burning fuels (gasoline, wood, coal, or natural gas) and are associated with refineries, oil and gas production equipment, and other industrial processes. VOCs are also released from chemicals like solvents, paints and thinners, adhesives, air fresheners, copy machines

and printers, cleaners and disinfectants, and other consumer products (National Institute of Health, U.S. National Library of Medicine 2017). Biogenic sources, such as trees and plants, can also represent a substantial portion of NO_x and VOC emissions in an area, including New Mexico (BLM 2018a). The upstream sources of VOCs that are produced during the production of oil and gas are during the separation of gases from liquids and the storage process. Such emissions are generally controlled with the use of enclosed combustion devices, such as flares. Leaks and ineffective control systems are also a source of VOC emissions. In the event that VOCs are produced from incomplete combustion, they become more highly reactive ozone precursors (Matichuk et al. 2016).

Monitoring conducted by the NMED (under the EPA) in the analysis area indicates that levels of O₃ have come close to, but have not yet exceeded, the NAAQS in San Juan County (NMED 2019b; see also Table 3.1). If such exceedances were to occur, the area would be designated as a “nonattainment” area, which could impact industrial development for the area (NMED 2019b). The NMED Air Quality Bureau has begun developing an Ozone Attainment Initiative, which, if implemented on schedule, will have a plan in place by summer 2020. The Ozone Attainment Initiative plan will set standards for emission sources that contribute to the exceedance of design values of 95% or more, in particular to control NO_x and VOCs to achieve maintenance or attainment of the standards pursuant to New Mexico Statutes 74-2-5.3 (NMED 2019a).

Particulate Matter

Particulate matter (also known as particle pollution) is a mixture of solid particles and liquid droplets in the air. Particulate matter varies in size: PM₁₀ refers to particulate matter 10 micrometers or less in diameter (commonly considered “dust”). PM_{2.5} refers to particulate matter that measures 2.5 micrometers or less (i.e., fine particles), which are the main cause of reduced visibility (haze) in the United States (EPA 2019d). The EPA regulates inhalable particulate matter 10 micrometers in diameter or smaller (PM₁₀ and PM_{2.5}) because such particulates are inhalable into the lungs (NMED 2019c); the EPA does not regulate particles larger than 10 micrometers in diameter (such as sand and larger dust particles). PM_{2.5} is not currently monitored in the analysis area, and there are no areas of high concentrations that would warrant monitoring by the NMED. Recent monitoring for PM₁₀ (dust) in the analysis area began in 2017 at a San Juan County monitoring site. Like O₃, most particulate matter is formed by reactions between other chemicals, specifically between SO₂ and NO_x, which are emitted from vehicles, power plants, and other industrial processes (EPA 2019d). Particulate matter emissions often result from activities like construction, traffic on unpaved roads, fields, and wildfires (EPA 2019d). Particulate matter is of heightened concern when emissions are near sensitive receptors, such as residences, because particulate matter can be present in higher concentrations in a localized area prior to settling or dispersion.

3.1.1.2 HUMAN-CAUSED EMISSIONS

Along with criteria pollutant concentrations as measured by air monitors, the EPA provides data on human-caused criteria pollutant emissions, expressed in tons per year or total volume of pollutant released into the atmosphere. Human-caused emissions data point to which industries and/or practices are contributing the most to the general level of pollution (BLM 2018a). Total human-caused emissions within the analysis area are reported in Table 3.2, based on 2014 National Emissions Inventory (NEI) in tons per year (EPA 2014).

These emissions are primarily the result of electrical power generation, oil and gas and other mineral development, vehicles (highway and off-highway traffic), and other industrial activities (EPA 2014). The primary sources of several criteria air pollutants in the analysis area are two coal-fired electrical generation units: the San Juan Generating Station 15 miles west of Farmington, New Mexico, and the Four Corners Power Plant on the Navajo Nation near Fruitland, New Mexico. These electrical generation units are the primary source of SO₂, NO_x, and PM_{2.5} in the analysis area (BLM 2018a; EPA 2014). Oil

and gas development is also a prominent source of emissions. There are approximately 23,034 active oil and gas wells in the New Mexico portion of the San Juan Basin, which has been a producing oil and natural gas field since the early to middle 1900s. About 16,139 of the wells in the aforementioned counties are federal wells, with the remainder falling in other jurisdictions (BLM 2018a). Over the last 5 years, there have been 243 federal well completions, all of which occurred within the FFO (BLM 2018a).

The Western States Air Resources Council–Western Regional Air Partnership (WESTAR-WRAP) conducted an oil and gas emissions inventory report for base year 2014 to further clarify the contributions of oil and gas activities to human-caused emissions within the Permian and San Juan Basins. The results indicate that there are non-point sources, including fugitive components, pneumatic devices, pumps, and well blowdown events, that may not be reported through the state and federal inventories. These nonpoint sources could represent greater criteria, hazardous air pollutants (HAPs), and greenhouse gas emissions within these basins, in particular VOC and NO_x emissions that contribute to ozone formation. It is therefore believed that the 2014 NEI data in Table 3.2 related to petroleum and related industries are underreported in terms of VOC and NO_x emissions. Table 3.2 provides a comparison of NEI and WESTAR-WRAP datasets.

As shown in the table, a comparison of datasets indicates that oil and gas development–related NO_x and VOC emissions may be underreported by approximately 58% and 49%, respectively.

Table 3.2. Human-Caused Emissions in the New Mexico Portion of the San Juan Basin, in Tons per Year

Emissions	NO_x	CO	VOC	PM₁₀	PM_{2.5}	SO₂
2014 NEI—all sources	70,255	166,934	93,763	118,725	18,899	6,602
2014 NEI—petroleum and related industries	25,011	–	66,385	–	–	–
WESTAR-WRAP 2014 oil and gas sources	59,989	–	90,064	–	–	–

Sources: EPA (2014) and Ramboll Environ (2017). Includes data for San Juan, Sandoval, Rio Arriba, and McKinley counties.

Notes: Values include Tier 1 summaries for each county, including combustion, industrial, on-road/non-road, and miscellaneous sectors. Biogenic sources are not included.

Only precursor pollutants to ozone formation are compared in this analysis (NO_x and VOCs).

The data above do not consider the following changes in operations at the San Juan Generating Station (a four-unit coal-fired generator) and the Four Corners Power Plant (a five-unit coal-fueled generator) to meet the requirements of the federal regional haze rule:

- In 2016, two of the four units at the San Juan Generating Station had selective catalytic reduction technology installed to satisfy Best Available Retrofit Technology (BART) requirements from EPA (Enchant Energy 2019a). The installation of selective catalytic reduction technology is estimated to result in a 67% reduction in SO₂, 62% reduction in NO_x, 50% reduction in particulate matter, 44% reduction in CO, 51% reduction in VOCs, 50% reduction in CO₂, and 50% reduction in mercury (BLM 2018a). In December 2017, the two units that did not meet the BART requirements were closed. In March 2018, an explosion at one of the two remaining units rendered it inoperable (Navajo Times 2018).
- In 2013, three of the five units at the Four Corners Power Plant were shut down. In mid-2018, the two remaining units had selective catalytic reduction technology installed to satisfy BART requirements from EPA (Power Magazine 2019). It is estimated that this retrofit will result in a 36% reduction in NO_x, a 61% reduction in mercury, a 43% reduction in particulate matter, a 30% reduction in CO₂, and a 24% reduction in SO₂ (BLM 2018a).

3.1.1.3 AIR QUALITY INDEX

The level of emission for a pollutant, in consideration of weather and geographical influences, is a key factor affecting the concentration of that pollutant in an area. Emissions, which contribute to concentrations, can be understood through the Air Quality Index (AQI). The AQI is used to report daily air quality information in an easy-to-understand way by explaining how local air quality relates to human health. Calculated by the EPA, the AQI considers the following: O₃, particulate matter (PM_{2.5} and PM₁₀), NO₂, SO₂, and CO. According to the EPA, O₃ and particulate matter, both calculated daily for the AQI, are the two air pollutants that pose the greatest threat to human health (AirNow 2016). The higher the AQI value, the greater the level of air pollution and the greater the concern for public health. An AQI value of 100 typically corresponds to the NAAQS set for that pollutant, and values below 100 are considered satisfactory for public health. The AirData AQI interactive map and summary report (EPA 2019d) provides annual summary information, including maximum AQI values and the count of days in each AQI category. Table 3.3 provides a summary of the number of days classified above 100 (unhealthy for sensitive groups or worse) for the counties in the analysis area for the period from 2006 through 2019.

Table 3.3. AQI Summary Data for Number of Days Classified above 100 for the Analysis Area (2006–2019)

County	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
San Juan	24*	45	3	0	20 [†]	18	12	6 [‡]	0	2	2	6	16	0
Sandoval	17	6	0	0	0	0	0	0	0	0	0	1	12	0
Rio Arriba	0	0	0	0	0	0	0	2	0	0	0	3	3	0
McKinley	–	–	0	0	0	0	0	0	–	–	–	–	–	–

Source: EPA (2019d)

Note: All AQI values presented are classified as unhealthy for sensitive groups (101–150), unless otherwise indicated. Annual summary data for McKinley County are only available for 2008–2013.

* Including one (1) unhealthy day (above 150).

[†] Including five (5) unhealthy days (above 150) and two (2) very unhealthy days (above 200).

[‡] Including one (1) unhealthy day (above 150).

For the reporting period, San Juan County had the most incidences of the number of days classified above 100 annually, including 9 days reaching unhealthy (7 days above 150) to very unhealthy (2 days above 200) for everyone. These days occurred in 2006 (1 unhealthy day), 2010 (5 unhealthy days and 2 very unhealthy days), and 2013 (1 unhealthy day). While there are exceedances of NAAQS on those days with AQI values over 100, these exceedances do not represent a trend of degrading AQI values over time (BLM 2018a).

3.1.1.4 HAZARDOUS AIR POLLUTANTS

The CAA requires control measures for HAPs, which are a class of 187 toxic air pollutants that are known or suspected to cause cancer or other serious health impacts and/or adverse environmental impacts. National Emissions Standards for Hazardous Air Pollutants (NESHAPs), established by the EPA, limit the release of specified HAPs from specific industries (BLM 2018a). NESHAPs for oil and gas development include control of benzene, toluene, ethyl benzene, mixed xylenes, and n-hexane from major sources, and benzene emissions from triethylene glycol dehydration units as area sources (BLM 2018a). The CAA defines a major source for HAPs as being one that emits 10 tons per year of any single HAP or 25 tons per year of any combination of HAPs. Under state regulations, a construction or operating permit may be required for a major source and, for New Mexico, determining a major source requires consideration of each oil and gas exploration and production well individually (BLM 2018a). In New

Mexico, regulations for major sources are found under 20.2.70 and 20.2.71 New Mexico Administrative Code (NMAC).

The Air Resources Technical Report discusses the relevance of HAPs to oil and gas development and the particular HAPs that are regulated in relation to these activities (BLM 2018a). The EPA conducts a periodic National Air Toxics Assessment (NATA) that quantifies HAP emissions by county in the United States. A review of the results of the 2014 NATA shows that cancer, neurological risks, and respiratory risks in the analysis area (San Juan, Sandoval, Rio Arriba, and McKinley Counties) are generally lower than statewide and national levels, as well as those for Bernalillo County, where urban sources are concentrated in the Albuquerque area (EPA 2019e).

3.1.2 *Environmental Impacts – No Action Alternative*

Under the No Action Alternative, the proposed mine project would not be approved, which means that the proposed surface mine would not be constructed and no humate would be removed from the area. No resulting impact to air quality or increases in fugitive dust would occur.

3.1.3 *Environmental Impacts – Proposed Action*

Mining activities associated with the proposed project would result in the release of emissions from the operation of internal combustion engines, as well as the emission of particulates (specifically PM₁₀ and PM_{2.5}) associated with fugitive dust from increased wind erosion, heavy equipment use during surface mining activity, product handling and transportation, and operation of vehicles and equipment on unpaved roads near and within the mine site. These activities would result in increased short-term fugitive dust and equipment exhaust emissions when compared to the No Action Alternative but would be similar to existing fugitive dust emissions from the existing Brie I Mine activity. Design features in the Mining and Reclamation Plan (see Appendix D), such as utilizing minimal personnel, traveling at reduced speeds, minimizing equipment idle time, and application of water to the mine site roadways and material stockpiles, would minimize fugitive dust emissions. As such, mining associated with the proposed project is unlikely to contribute to a violation of air quality regulations.

Table 3.4 shows estimated modeled emissions from operation of the Section 7 Mine over one year of operations and the percent increase in criteria pollutants over existing conditions. Emissions calculations in Table 3.4 are based on estimated emissions resulting from saleable solid mineral mining operations (BLM 2015).

Table 3.4. Emissions from Operation of the Section 7 Humate Mine

Emissions	Emissions (tons per year)					
	NO _x	SO ₂	CO	VOC	PM ₁₀	PM _{2.5}
Current human-caused emissions (San Juan, Sandoval, Rio Arriba, and McKinley Counties)	70,255	6,602	166,934	93,763	118,725	18,899
Emissions from proposed Section 7 Mine operation	0.15	0.00	0.08	0.02	6.79	0.73
Percent increase	0.0002%	0.00%	0.00005%	0.00002%	0.006%	0.004%

Total HAP emissions from operation of the proposed humate mine are projected to be 0 tons per year (BLM 2015).

Because the increase in overall emission levels would be low (less than 0.004%), the Proposed Action would not be expected to result in an increase in the number of days classified above 100 (unhealthy for sensitive groups, or worse). Therefore, it is not anticipated that the Proposed Action would result in a change in the AQI for the analysis area. This incremental increase would not be expected to result in exceeding the NAAQS or state air quality standards for any criteria pollutants in the analysis area.

3.1.4 *Cumulative Impacts*

3.1.4.1 CUMULATIVE IMPACT AREA (CIA)

The CIA for this analysis is the New Mexico portion of the San Juan Basin.

3.1.4.2 PAST AND PRESENT ACTIONS

Current annual estimated emissions (see Tables 3.2 and 3.5) are reflective of the effects of past and present actions. Two major sources of criteria pollutant and VOC emissions are the San Juan Generating Station and the Four Corners Power Plant (BLM 2018a); however, the 2017 shutdown of two of the four units at the San Juan Generating Station and the 2016 and 2018 retrofitting of the remaining units both at the San Juan Generating Station and Four Corners Power Plant are expected to decrease emissions substantially (see Section 3.1.1.2).

Oil and gas development is also a prominent source of emissions. There are approximately 23,034 active oil and gas wells in the New Mexico portion of the San Juan Basin; of these, 16,139 are federal wells. There have been 243 federal well completions in the FFO over the last 5 years. (see Section 3.1.1.2). While there are exceedances of NAAQS on those days with AQI values over 100 (see Table 3.3), these exceedances do not represent a trend of degrading AQI values over time (BLM 2018a). Existing humate mines and other solid mineral mining operations also exist within the cumulative impact area. Emissions from these sources are accounted for in Section 3.1.3.

3.1.4.3 REASONABLY FORESEEABLE FUTURE ACTIONS

The Reasonable Foreseeable Development Scenario for Oil and Gas Activities: Mancos-Gallup Resource Management Plan Amendment (RMPA) Planning Area, Farmington Field Office, northwestern New Mexico (2018 RFD) (Crocker and Glover 2018) was used to determine the number of oil and gas wells in the Mancos-Gallup RMPA Planning Area; this planning area includes most of the FFO and is where most potential oil and gas development is assumed to occur. The BLM considers the 2018 RFD to contain the most accurate information about the reasonably foreseeable number of wells and surface disturbance for the New Mexico portion of the San Juan Basin. Continued oil and gas development is a prominent reasonably foreseeable future action impacting air quality in the analysis area. The 2018 RFD estimates that there could be an additional 3,200 wells drilled within the analysis area by 2037 (Crocker and Glover 2018), or about 160 wells per year. Annual emissions associated with the RFD are disclosed in Table 3.5.

The BLM FFO has also received two other applications for humate mines within the analysis area that are under-going review. The two mines have a cumulative mine permit area of 160 acres. Continued humate development is a reasonably foreseeable future action due to these applications. Annual emissions associated with these two proposed humate mine projects are disclosed in Table 3.5.

PNM announced its intent to close the San Juan Generating Station in 2022, when the coal supply agreement expires. However, the City of Farmington has indicated interest in retaining ownership post-2022 and has teamed with Enchant Energy to repurpose the San Juan Generating Station into a commercial-scale carbon-capture utilization and sequestration facility and wholesale power generator (Enchant Energy 2019a). A July 2019 pre-feasibility study recommended development of a more in-depth

front-end engineering and design study (Sargent and Lundy 2019). The Los Alamos National Laboratory is currently working on a technology evaluation report that is expected in December 2019 (Enchant Energy 2019b). Given the uncertainties around this project, expected reductions in emissions are not included in the cumulative impact emissions disclosed below.

The NMED Air Quality Bureau has begun developing an Ozone Attainment Initiative to set standards for emission sources that contribute to the exceedance of design values of 95% or more, in particular to control NO_x and VOCs to achieve maintenance or attainment of the standards pursuant to New Mexico Statutes 74-2-5.3 (NMED 2019a).

3.1.4.4 CUMULATIVE IMPACT ANALYSIS

Table 3.5 quantifies annual emissions from past, present, and reasonably foreseeable future actions in conjunction with the operation of the proposed project.

Table 3.5. Cumulative Air Emissions from Mineral Development

	Emissions (tons per year)					
	NO _x	SO ₂	CO	VOC	PM ₁₀	PM _{2.5}
Current human-caused emissions (New Mexico portion of San Juan Basin)	70,255	6,602	166,934	93,763	118,725	18,899
Total annual emissions from 2018 RFD (160 wells/year)*	990.40	17.60	420.80	187.72	849.60	129.60
Operational emissions associated with proposed Section 7 Mine	0.15	0.00	0.08	0.02	6.79	0.73
Operational emissions associated with two other proposed humate mines	0.30	0.00	0.16	0.04	13.58	1.46
Total	990.85	17.60	421.04	187.78	869.97	131.79
Percent increase	1.41%	0.27%	0.25%	0.20%	0.73%	0.70%
Percent Contribution of Proposed Action to Total Annual Cumulative Impact	0.0002 %	0.00%	0.00005 %	0.00002 %	0.006%	0.004%

* The representative well used to calculate RFD emissions is a horizontal oil well. VOC emissions during the operational phase represent a 95% control efficiency and represent the contribution for “one oil well” from emissions at storage tanks, gathering facilities, etc. HAP emissions, which are generally estimated at about 10% of VOCs (or 18.72 tons per year), should be considered a very gross estimate and likely an overestimate. The emissions are a combination of HAP constituents existing in natural gas and are released during the completion and operation process. Most gas vented during the completion process is flared, which substantially reduces the quantity of HAPs released. For more information, see BLM 2018a.

Reasonably foreseeable future actions, including development of the proposed Section 7 Mine, would result in an incremental increase in overall emission levels between 0.20% and 1.41% of existing emissions. The proposed mine would generally contribute a small percentage of cumulative emissions in each category. Emissions associated with the 2018 RFD are anticipated to be at the most acute level during well construction and completion phases; because not all wells would be constructed at the same time, it is anticipated that the incremental addition of criteria pollutants and VOCs may be lower than reported above. Accordingly, the cumulative impacts disclosed above are not be expected to result in any exceedances of the NAAQS or NMAAQs for any criteria pollutants in the analysis area. Because the increase in overall emission levels would be low (1.41% or less), development of the proposed project, in conjunction with other reasonably foreseeable future actions, would not be expected to increase the number of days classified above 100 (unhealthy for sensitive groups, or worse).

Additionally, emissions associated with the 2018 RFD scenario and development of the proposed project would be offset by substantial decreases in emissions in the power generation sector resulting from shutdown of two of the units at the San Juan Generating Station, and the installation of selective catalytic reduction technology at both the San Juan Generating Station and the Four Corners Power Plant; these changes are not yet accounted for in current human-caused emissions estimates. Emissions may also be reduced through the Ozone Attainment Initiative. Cumulatively, it is expected that future levels of criteria pollutant, VOC, and HAP emissions would be lower than current levels due to the aforementioned factors, despite the increases in emissions associated with reasonably foreseeable oil and gas development and the proposed project.

3.1.5 Mitigation and Residual Impacts

Design features (detailed in Section 2.1 and Appendix D) have been established to minimize dust by limiting surface disturbance, requiring interim and final reclamation of 10-acre sequences before moving to a new mine area, and implementing dust control on dirt roads and within the mine site. No additional mitigation is proposed, and residual impacts would be the same as described in Section 3.1.3 (Environmental Impacts – Proposed Action).

4 Consultation and Coordination

4.1 Summary of Consultation and Coordination

4.1.1 ESA Consultation

BLM FFO biologists have reviewed the Biological Report generated for this proposed action and it has been determined that the proposed project would comply with threatened and endangered species management guidelines outlined in the BA associated with the PRMP/FEIS (see Table 1.3 [Issues Identified but Eliminated from Detailed Analysis] and NEPA IDT checklist [Appendix G]).

In 2014, the yellow-billed cuckoo was listed as threatened with proposed critical habitat. There is no nesting habitat for this species within or adjacent to the proposed project area. The nearest designated critical habitat for this species is approximately 30 miles to the north. Therefore, the Proposed Action would not impact this species.

The New Mexico meadow jumping mouse was listed as endangered in 2014. There is no riparian habitat within or adjacent to the proposed project area. The nearest designated critical habitat for this species is approximately 60 miles to the east-southeast. Therefore, the Proposed Action would not impact this species.

4.1.2 Tribal Consultation

Tribal consultation for the proposed project was initiated on a government-to-government basis by the BLM FFO with various Pueblos and Tribes of New Mexico and southern Colorado. A letter and map describing the proposed project and inviting consultation with the BLM FFO was sent via certified mail to each of the various Pueblos and Tribes listed in Table 4.1 on December 11, 2018 with a request for response within 30 days of receipt.

Table 4.1 Pueblos and Tribes Who Received Consultation Invitations from the BLM FFO.

Tribe	Name
All Pueblos Council of Governors	Governors
Eight Northern Indian Pueblos Council	Governors
Five Sandoval Indian Pueblos	Governors
Jicarilla Apache Tribal Council	President Darrell Paiz
Kewa Pueblo (Pueblo of Santo Domingo)	Governor Thomas Moquino, Jr
Nageezi Chapter House	President Ervin Chavez
Navajo Nation	President Jonathan Nez
Ohkay Owingeh	Governor Ron Lovato
Pueblo of Acoma	Governor Brian Vallo
Pueblo of Cochiti	Governor Charles Naranjo
Pueblo of Isleta	Governor Max Zuni
Pueblo of Isleta, Tribal Historic Preservation Office	Dr. Henry Walt
Pueblo of Jemez	Governor David Toledo
Pueblo of Laguna	Governor Wilfred Herrera, Jr.
Pueblo of Nambe	Governor Phillip A. Perez
Pueblo of Nambe, Tribal Historic Preservation Office	Lt. Governor Arnold J. Garcia
Pueblo of Picuris	Governor Craig Quanchello
Pueblo of Pojoaque	Governor Joseph M. Talachy
Pueblo of San Felipe	Governor Anthony Ortiz
Pueblo of San Felipe Department of Natural Resources	Pinu'u Stout, Director
Pueblo of San Ildefonso	Governor Perry Martinez
Pueblo of Sandia	Governor Stuart Paisano
Pueblo of Santa Ana	Governor Lawrence Montoya
Pueblo of Santa Ana Tribal Historic Preservation Office	Director Timothy Menchego
Pueblo of Santa Clara	Governor J. Michael Chavarria
Pueblo of Taos	Governor Edward Concha
Pueblo of Tesuque	Governor Robert Mora, Sr
Pueblo of Zia	Governor Fredrick Medina
Pueblo of Zuni	Governor Val R. Panteah, Sr.
Southern Ute Indian Tribe	Chairwoman Christine Baker-Sage
Ten Southern Pueblo Governor's Council	David Toledo, Chair
The Hope Tribe	Chairman Timothy L. Nuvangyaoma
Ute Mountain Ute Tribe	Chairman Manuel Hart

In response to the consultation letter, a consultation request was received by the BLM from the Navajo Nation Heritage and Historic Preservation Department (NNHHPD). Through consultation with NNHHPD, it was determined that an ethnographic report was needed for this project. The applicant, Miocene, identified a contractor, NV5, who completed the ethnographic report. The report was submitted to the BLM FFO in April 2020. After reviewing the report and conducting additional field work, BLM FFO archaeologists determined there would be no impact on sensitive cultural resources.

4.1.3 New Mexico State Historic Preservation Office (SHPO) Consultation

Section 106 of the NHPA and its implementing regulations require federal agencies to consider what impact their licensing, permitting, funding, or otherwise authorizing an undertaking may have on properties listed on or eligible for listing on the National Register of Historic Places. Specific definitions for key cultural resources management concepts (such as undertakings, impacts, and areas of potential effect) are provided in 36 CFR Part 800.16

The New Mexico BLM has a two-party agreement with the SHPO (hereafter referred to as the Protocol) that implements an authorized alternative to 36 CFR Part 800 for most undertakings (BLM and SHPO 2014). The Protocol offers a streamlined process for reporting and review that expedites consultation with the SHPO.

A Class III Archaeological Survey (NMCRIS No. 135810; BLM Report No. 2017(I)003F; Marron 2016b) was conducted in the proposed project area and during this survey three archaeological sites were discovered. Two of these sites (LA185556, & LA185558) were determined to be Eligible for listing on the NRHP, and one site (LA185557) was determined to be Not Eligible for listing on the NRHP. Both of the Eligible sites will be protected by temporary fencing and archaeological monitoring and the Not Eligible site will require no further work. With the adherence of these stipulations, the proposed project will have no effect on historic properties.

5 List of Appendices

- Appendix A List of Preparers
- Appendix B Acronyms and Abbreviations
- Appendix C List of References
- Appendix D Mining and Reclamation Plan
- Appendix E Paleontological Survey Report
- Appendix F National Environmental Policy Act Interdisciplinary Team Checklist

Appendix A: List of Preparers

This EA has been prepared jointly by Marron and Associates and the BLM FFO to comply with the requirements and guidelines prescribed by the BLM. The table below contains a list of individuals that contributed to or reviewed this EA.

List of EA Preparers

Name	Title	Organization
Chris Wenman	Geologist	BLM FFO
Tony Gallegos	Mining Engineer	BLM FFO
Ryan Joyner	Planning and Environmental Coordinator	BLM FFO
Erik Simpson	Archaeologist	BLM FFO
Kim Adams	Archaeologist	BLM FFO
Stanley Allison	Outdoor Recreation Planner	BLM FFO
Cassandra Gould	Rangeland Management Specialist	BLM FFO
Nolan Craun	Rangeland Management Specialist	BLM FFO
Lola Henio	Tribal Liaison	BLM FFO
John Kendall	Threatened and Endangered Species Biologist	BLM FFO
Jeff Tafoya	Supervisory Natural Resource Specialist	BLM FFO
Ryan Joyner	Planning and Environmental Coordinator	BLM FFO
Whitney Thomas	Physical Scientist	BLM FFO
Marcel Browne	GIS Specialist	Marron and Associates
Christina Chavez	P.I., Archaeologist	Marron and Associates
Julie Dickey	Environmental Specialist	Marron and Associates
Toni Goar	Archaeologist	Marron and Associates
Eric Johnson	Senior Environmental Project Manager	Marron and Associates
Paul Knight	Lead Biologist	Marron and Associates
Alex Ochoa	GIS Specialist	Marron and Associates

Appendix B: Acronyms and Abbreviations

2018 RFD	The Reasonably Foreseeable Development Scenario for Oil and Gas Activities: Mancos-Gallup Resource Management Plan Amendment (RMPA) Planning Area, Farmington Field Office, northwestern New Mexico
AQI	Air Quality Index
ARPA	The Archaeological Resources Protection Act of 1979
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
EA	Environmental Assessment
EMNRD	New Mexico Department of Energy, Minerals, and Natural Resources
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
FFO	Farmington Field Office
FONSI	Finding of No Significant Impact
GHG	greenhouse gas
H ₂ S	hydrogen sulfide
HAP	hazardous air pollutant
IDT	Interdisciplinary Team
MBTA	Migratory Bird Treaty Act of 1918
mg/l	milligrams per liter
MIM	Minimum Impact Mine
MLA	Mineral Leasing Act of 1920
MMD	New Mexico Mining and Minerals Division of the EMNRD
NAAQS	National Ambient Air Quality Standards
NATA	National Air Toxics Assessment
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act of 1966

NMAAQS	New Mexico Ambient Air Quality Standards
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMOCD	New Mexico Energy, Minerals and Natural Resources Department – Oil Conservation Division
NO ₂	nitrogen dioxide
NO _x	nitrogen oxide(s)
O ₃	ozone
Pb	lead
PL	Public Law
PM _{2.5}	particulate matter equal to or less than 2.5 microns in diameter
PM ₁₀	particulate matter equal to or less than 10 microns in diameter
PRMP/FEIS	Proposed Resource Management Plan and Final Environmental Impact Statement
RMP	Resource Management Plan
RMPA	Resource Management Plan Amendment
SDA	Specially Designated Area
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO ₂	sulfur dioxide
Stat.	Statute
TDS	total dissolved solids
USC	United States Code
USGS	United States Geological Survey
VOC	volatile organic compound
VRM	visual resource management
WESTAR-WRAP	Western States Air Resources Council – Western Regional Air Partnership

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Appendix D: Mining and Reclamation Plan

***Section 7 Humate Mine
Mining and Reclamation Plan
Miocene, LLC***

Presented to the New Mexico Energy, Minerals
and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
and
Bureau of Land Management-Farmington Field Office
6521 College Blvd., Suite A
Farmington, NM 87402

May 2019

Prepared by:

Miocene, LLC
100 Fillmore Street, Suite 500
Denver, Colorado 80206

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1.0-Introduction:

Miocene, LLC, hereafter referred to as “Miocene,” proposes to operate the Section 7 Mine in McKinley County, New Mexico. The mine is intended to be a *minimal impact operation* with the mined material being carbonaceous shale or humate. This proposed mine plan occupies land in Section 7, Township 19 North, Range 5 West, NMPM, specifically the NW ¼ of Section 7. The acreage proposed in this mine plan follows a sequence of approximately 10-acre disturbances integrated with reclamation between new mining disturbances. Maps identifying the proposed acreage and *minimal impact mine* (hereafter referred to as “MIM”) acreage are provided in Figures 1 through 3. Figure 1 is a topographic map of the proposed permit area; Figure 2 is the proposed Section 7 Mine acreage; and Figure 3 illustrates the proposed approximate 10-acre MIM sequences. Miocene proposes to permit the mining area as an amendment to the Brie #1 Mine with the New Mexico Mining and Minerals Division (MMD) through a modification to the existing Brie I Mine. This document is intended to fulfill the requirements of the BLM-FFO for project permitting. As the existing Brie I Mine is permitted on private property, coordination between Miocene, BLM-FFO, and EMNRD-MMD is intended to ensure overall operation of the proposed mine remains consistent with the existing permit while matters relevant to BLM-FFO surface and minerals operations are handled appropriately. This mine plan covers the proposed PA and the initial set of 10-acre mining increments.

2.0-Operator Information:

Company Name: Miocene, LLC

Company Address: 100 Fillmore Street, Suite 500
 Denver, Colorado 80206
 Phone: (505)205-4208

Primary Contact: Kristopher Lindgren

3.0-Location and Acreage:

The proposed mine site is located in McKinley County, New Mexico, Section 7, Township 19 North, Range 5 West, NMPM (Figure 3). The area is located on BLM administered lands. The initial MIM will be located in the NW¼ of Section 7. The elevation of the proposed mine is 6,615 to 6,640 feet above mean sea level (famsl).

Driving Directions to the proposed MIM are as follows:

West on New Mexico Highway 197 from the intersection at Highway 550 in Cuba, New Mexico 17 miles to Indian Service Route 474, west on 474 to Ojo Encino, south to Pipeline Road, turn west on Pipeline Road and continue for 2.5 miles, site on left.

4.0-Geology and Environmental Setting:

The proposed mine is located 3.5 miles north of New Mexico Highway 197. Pipeline Road runs immediately to the north of the proposed mine site. The topography typically gently slopes to the south and is flat in many areas. There are no major topographical features within the proposed mining area. The MIM is located at an elevation of 6,620 famsl.

Surface soils are light-colored, calcareous silts and sands. The area is underlain by sedimentary rocks of the southeast San Juan Basin, a major structural feature of northwest New Mexico. The rock assemblage is a heterogeneous, non-marine sequence composed of shale, siltstone, sandstone, and mudstone deposited in floodplain, fluvial, and lacustrine settings within the Fruitland Formation.

Access to Section 7 is via New Mexico Highway 197, Service Route 471, and Pipeline Road. Proposed access to the MIM is via Pipeline Road. A pipeline right-of-way runs northwest to southeast along Pipeline Rd.

Humates occur near-surface at shallow depths within the area (three to fifteen feet below ground surface [bgs]). It is estimated that humate thickness averages three to seven feet over the majority of the proposed permit area.

The mining of humate is anticipated to have minimal effect on human health or the environment. The U.S. EPA published findings regarding the effect of humate on human health and the environment. These documents are located within the Federal Register Vol. 68, No. 114, Friday, June 13, 2003, Proposed Rule, page 35349; and 40 CFR 180, page 33576, Final Rule. There are no known hazardous materials that could be exposed and mobilized during extraction of humate.

5.0-Climate and Hydrology:

Climate conditions within the area is similar to conditions found in the Great Basin desert scrub of northwestern New Mexico. Temperatures range between 40° to 85°F; minimum temperatures range between 9° and 50°F. The area receives approximately twelve inches of precipitation annually. The highest percentage of precipitation occurs in the monsoon months of July and August. There is one drainage feature within the proposed area. Surface waters flow southeast to Papers Wash and eventually to Papers Lake, an evaporative basin. There are no rivers or washes upstream of the area. The area contains no perennial water sources, wetlands, or springs. Ground water occurs at depths between 200+ (NM-OSE Website) to 1200 feet bgs (personal communication, Peabody Coal, February 2013).

6.0-Current Land Use:

The only land use within the area is for grazing. The MIM is located within the Star Lake Community grazing allotment. The majority of the area appears to be over-grazed.

7.0-Flora and Fauna:

The proposed MIM is located within two main vegetation communities: Desert Grassland and Great Basin Desert Scrub. The Desert Grassland community consists of blue grama (*Bouteloua gracilis*), galleta grass (*Pleuraphis jamesii*), and scattered saltbush (*Atriplex obovata*), with a vegetative ground cover estimated at less than 15 percent. The Great Basin Desert Scrub community consists of saltbush (*Atriplex spp.*), blue grama, galleta grass, and alkali sacaton (*Sporobolus airoides*), with a vegetative ground cover estimated at less than 10 percent. In areas where the surface is underlain by silt and sand, the community is dominated by big sagebrush

(*Artemisia tridentata*) with a ground cover of approximately 40 percent. Significant barren ground occurs throughout the proposed area where the surface is underlain by humate. Section 7 is not located within any federally defined specially designated area such as a Wilderness Area, Wilderness Study Area or an Area of Critical Environmental Concern.

Desert Grassland and Great Basin desert scrub communities support a variety of wildlife, including mammals, birds, and reptiles. Mammal species commonly found in these communities include black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), white-tailed prairie dog (*Cynomys leucurus*), kangaroo rat (*Dipodomys* spp.), deer mouse (*Peromyscus maniculatus*), pocket mouse (*Perognathus* spp.), kit fox (*Vulpes macrotis*), and coyote (*Canis latrans*).

Reptile species that may occur in the area include collared lizard (*Crotaphytus collaris*), short-horned lizard (*Phrynosoma douglasii*), sagebrush lizard (*Sceloporus graciosus*), prairie lizard (*Sceloporus undulatus*), plateau striped whiptail (*Cnemidophorus velox*), bullsnake (*Pituophis melanoleucus*), and western rattlesnake (*Crotalis viridis*).

8.0-Archaeology, Paleontology, and Biology:

Marron and Associates, Inc., 7511 4th Street NW, Albuquerque, New Mexico, (Marron) will provide the necessary EA, archaeology, paleontology, and biology surveys for the proposed mine site. Marron will include a literature search and agency consultations. The literature search will yield previously identified/recorded cultural sites within the area. Class III surveys will be recorded within the area to determine if the proposed MIM will have significant effect on identified cultural resources. Marron is a New Mexico consulting firm with expertise in providing environmental investigations, National Environmental Policy Act (NEPA) documentation, National Historic Preservation Act (NHPA) document preparation, resource surveys, public involvement, and agency coordination. The firm's experience includes ecological and human risk assessments; environmental analysis; environmental, biological and cultural resource investigations and documentation; environmental regulatory compliance; environmental oversight and monitoring; and resource and environmental planning.

Disturbance buffers will be placed around the two archeological sites (LA 185556 and LA 185558) noted in the Class III survey of the property. Please refer to Figure 6 for an illustration of the avoidance buffers.

Any and all archeological, paleontological, or cultural artifacts discovered during operations will result in cessation of mining and both BLM-FFO and EMNRD-MMD will be notified immediately.

9.0-Visual Resources:

Miocene will apply due diligence to reduce the cumulative visual impact of mining areas by locating facilities on-site with minimal visual profiles.

10.0-Noise Levels:

Noise levels within the PA are not expected to exceed a maximum of 85 dBA during operating hours. The increase in noise levels associated with mining activity would be restricted to the MIM area. Excavation will be limited to daytime hours. A minimal amount of equipment would be

utilized to mitigate noise levels. No occupied residences occur within approximately 0.5 miles of the area that would be impacted by MIM noise levels.

11.0-Air Quality:

The typical source of regional air emissions is from exposed surface soils due to high wind. Development of a MIM is anticipated to have minimal added impact on air quality. Potential added impacts include increased airborne soil particles from mining, stockpiling, and transportation. The degree of added impact will depend on the soil type and seasonal conditions. Dust generation may be suppressed using water applied to roadways and/or stockpiles if warranted. Exhaust emissions from heavy equipment and dust emission from mining and transport would continue for the duration of mining and reclamation activities. Impacts from emissions and dust would generally be localized to the MIM area. Impact to human health and the environment is expected to be minimal.

12.0-Storm Water Management:

A Storm Water Pollution Prevention Plan (SWPPP) will be prepared for the area. The SWPPP will present storm water BMPs to manage storm water within each operational MIM. Storm water accumulated within the MIM footprint will be collected and evaporated or beneficially used for dust suppression. BMPs described will be deployed and maintained. Silt fencing, hay bales, and straw waddles are typical BMP features that will be used as necessary for proper storm water management.

An electronic filing of a Notice of Intent (NOI) to begin excavation activities will be submitted to Region 6 of the Environmental Protection Agency. A hardcopy of the SWPPP will be maintained on-site. BMPs presented in the SWPPP will be maintained by field personnel.

13.0-Traffic Route and Conditions:

The area surrounding Section 7 is remote and sparsely populated. Pipeline Road, a gravel base road is used by local residents, oil and gas employees for pipeline inspection and maintenance, and conveyance between New Mexico Highway 197, Ojo Encino, Thoreau, and Grants, New Mexico. The mining operation is expected to have two-to-seven haul trips/day transporting humate from the mine to customers in the surrounding area. Light trucks will be used for transport of employees to and from the site.

The access road from the mine to Pipeline will be constructed near the western, north-south Section 7 boundary with Section 12, Township 19N, Range 6W (current Brie Mine Site). Trucks will travel from the mine to Service Route 471, then to Cuba, NM on NM-197. Please see Figure 4 and Figure 5 for detailed description.

14.0-Proposed Operations:

Miocene proposes to operate the mine during daylight hours, typically Monday through Friday during the relatively dry months of the year. Annual production is estimated to be approximately 5,000-15,000 tons/year initially. To accomplish the proposed mining activities and proper reclamation of successive MIMs, the mining operations will follow a “*phased*” approach as

outlined below. Please note the cumulative disturbances area will not exceed the maximum 10-acre MIM disturbance during any given period during the mining sequence.

Description	Disturbance Area	Purpose
Staging Area	0.1-0.5 acre	Equipment Storage
Stockpiles	0.5-2 acres	Material Storage
Mine Excavation	Up to 9 acres	Material Excavation
Access Road	Up to 1.25 acres	Hauling/Trucking

Phase 1: Initial MIM Operation/Setup

1a) Construction of Access Road and Initial MIM

Access the MIM will be constructed to Section 7 from the pre-existing Brie I Mine (permit number MK039MN) site on Section 12, Township 19N, Range 6W west of the proposed PA. Installation of culverts is not expected at this time. Roads will be designed to ensure topography and drainage character is maintained to the most practical extent.

1b) Delineation of Mining Boundary

The mining boundary, including a setback inside the Section 7 boundary, will be delineated in the field using six-foot metal t-posts with four strand wire. The lower wire strand will not be barbed for wildlife protection. Boundary markers disturbed during mining operations will be replaced. Under no circumstances will the area outside the fenced boundary be disturbed. Fence maintenance will be part of routine operations.

1c) Determination of the Staging, Stockpile, and Laydown Areas

Up to 0.5 acre will be established for a staging area. Up to two-acres will be established for stockpiles though stockpiles are anticipated to occupy a much smaller area. The staging area will accommodate personnel, vehicles, and heavy equipment and store materials and supplies. The stockpile area will accommodate mulch, topsoil, overburden, and humate. Stockpile areas will be positioned to mitigate visual impacts. As mining and reclamation progresses, the staging, stockpile, and laydown areas will migrate with mining operations.

Phase 2: Mining Operations

Mining operations will advance in approximately 10-acre increments as mining progresses through Section 7. The following approach applies throughout mining operations and within each MIM.

2a) Clearing and Grubbing of Vegetation

Vegetation, roots, and organic debris will be removed from the surface and stockpiled for reuse as mulch during reclamation. Cleared vegetation, roots, and organic debris will be segregated from topsoil and overburden. Clearing and grubbing operations will occur in increments with each mining phase.

2a) Removal of Topsoil and Overburden

Topsoil and overburden will be removed and stockpiled for reuse during reclamation. Topsoil will be segregated and stored separately from overburden. Topsoil and overburden will be removed in increments within each mining phase.

2b) Removal of Humate

Humate will be extracted and stockpiled using a track hoe or front-end loader. The working face may be near vertical at times, a temporary feature only, as extraction of humate moves from one area of the excavation to the next. Stockpiled material will be loaded into 20-ton trucks for transport to customers. Production rates will depend on access road and excavation conditions, weather, and material demand. Weight will be recorded for each load that leaves the site by means of truck scales provided by the processing facility. Copies of all records will be kept at the processing facility.

Phase 3: Mining and Reclamation of Successive 10-acre MIMs

Please see *Section 15.0* for greater detail on reclamation.

Mining is expected to occur in an orderly manner, from one MIM sequence to the next. Reclamation of successive MIMs will be conducted when humate reserves have been exhausted. Reclamation will consist of backfilling, contouring, and revegetation of all mined, stockpile, staging, and laydown areas. All effort will be applied to minimize slope gradients and to apply mulch from the existing stockpile to mitigate erosion. Final slopes of all reclaimed areas will not exceed 3H:1V. The use of single or multiple retention ponds i.e., “surface water impoundments” may be used to capture surface water and wind-blown seed to facilitate reclamation. Periodic monitoring of the reclaimed area for vegetative success will begin upon completion of the reclamation effort and include each successively mined area as each is reclaimed.

3a) Progression of Mining

Mining will commence with the initial MIM. Progression of mining to successive areas within the area is expected as reserves are exhausted and mining progresses. Mining will be executed as outlined in Phase 2: *Mining Operations*. Delineation of roads within the area will provide future access to permitted MIMs while minimizing impacts to previously mined and reclaimed areas. Access roads within the area will be judiciously planned to capture future mining areas within Section 7 with minimal relocation or realignment. Reclamation of mined areas and access roads will be implemented at the end of each MIM operation. Mine reclamation will be made part of mine operations as mining progresses from one MIM to the next MIM. This “real-time” reclamation concept will permit efficient monitoring of improvements and vegetative growth by operations personnel.

3b) Equipment and Personnel Information:

The proposed operation will optimally utilize two to three full-time employees working daylight hours, typically five days/week (Monday through Friday), excluding holidays and inclement weather days. Work will occur during the relatively dry months of the year. All vehicles will be restricted to access roads and active mine operations. Once areas of reclamation are complete, no vehicles will be operated within the reclaimed areas except for the designated access road and for reclamation monitoring, maintenance, or rehabilitation activities. Equipment operated and/or stored on-site during MIM operation will consist of the following:

1. track hoe or front-end loader for excavation/stockpiling and earthwork
2. haul trucks for hauling material
3. road grader for access road maintenance
4. CAT 631G scraper for reclamation
5. John Deere or equivalent 32-horse tractor for reclamation
6. service truck for heavy equipment service/maintenance/fueling
7. optional small bullpen; locked, fenced area for storage
8. portable sanitation

Minimal quantities of hazardous materials will be utilized for equipment maintenance. Miocene intends to supply these materials as needed only. Potential materials are listed below. In the event of a spill, the impacted area will be bermed to prevent the spread of any fluids. Any leaks to the soil will be excavated and transferred to hazardous waste drums and disposed of appropriately.

<u>Materials</u>	<u>Use</u>
Diesel	Heavy Equipment Fuel
Grease/Oil	Lubrication
Hydraulic fluids	Heavy Equipment Operation
Ethylene Glycol	Antifreeze/Coolant

Health and Safety Issues and Practices:

The following procedures will be implemented to safeguard employees and the general public. “Caution” and “Unauthorized Personnel-Keep Out” signs will be posted on the fenced boundary. At a minimum, a locked gate with steel posts will be installed at the entrance to the MIM prior to any ground disturbance and maintained in working order throughout the life of the permit until the entire area has been reclaimed. The cable gate will remain locked when there is no activity at the site.

As noted above, excavation slopes will be no steeper than 3H:1V. The working face is the only exception. The working face may be near vertical at times with wall height up to 15 feet, a temporary feature only, as extraction of humate moves from one area of the excavation to the next. All effort will be applied to minimize slope gradients and to apply mulch from the existing stockpile to mitigate erosion. Finished slopes of all reclaimed areas will not exceed 3H:1V. The use of single or multiple retention ponds i.e., “surface water impoundments” may be used to capture surface water and wind-blown seed to facilitate revegetation. No underground workings will be employed in the mining process. All mine vehicles will be required to follow local posted speed limits. Right-of-Way will be given to local residents and Pipeline Road traffic.

Proposed Exploration Activities:

Miocene may undertake “*minimal impact exploration*” using shallow hand-augers or overland travel assisted drilling as mining progresses within the proposed PA to further delineate reserves. These exploration holes will aid in directing future mining activities. These auger holes will be placed as needed throughout the project as mining, time, and weather permits. It is expected that augering or drilling will stay ahead of each incremental 10-acre MIM. Drilling will be permitted appropriately in conjunction with BLM-FFO and EMNRD-MMD. All exploration activities will occur within the permit area.

15.0 RECLAMATION

Miocene will apply due diligence in working with the EMNRD-MMD and BLM-FFO to facilitate the use of best management practices (BMPs).

Miocene proposes to reclaim all disturbed areas within the area. The goal is to re-establish the area as a self-sustaining, climax ecological community emulating the surrounding vegetative community. All mining equipment and materials will be removed upon completion of mining

activities and closure of the area. Disturbed surfaces, access roads, and MIMs will be tied to the surrounding terrain (contour) as much as practicable. All disturbed areas will be reclaimed using a seed mix specified by EMNRD-MMD and BLM-FFO.

Reclamation shall be conducted commensurate with mining activities under a progressive reclamation schedule based on mining phases. Reclamation will commence once humate has been exhausted from a given area and mining moves to the next area or next permitted MIM area. This sequence shall continue throughout all mining operations.

Mining is expected to occur in an orderly manner from one pre-approved MIM area to the next. Reclamation of successive MIMs will be conducted when humate reserves on each MIM has been exhausted. Reclamation will consist of backfilling, recontouring, and revegetation of all mined, stockpile, staging, and laydown areas. Periodic monitoring of the reclaimed surface area for vegetative success will begin upon completion of the reclamation effort and include each successively mined area as each area is reclaimed.

Reclamation of mined areas will be implemented at the end of each MIM operation within the PA. Mine reclamation will be made part of mine operations as mining progresses from one MIM to the next MIM. This “real-time” reclamation concept will permit efficient monitoring of improvements and vegetation growth by operations personnel.

The phased approach below outlines the necessary steps for Miocene to fulfill short- and long-term goals for the proposed project. This approach includes clearing and grubbing, removal of topsoil and overburden, stockpiling, backfilling, recontouring, revegetation, and erosion control. Retention ponds may be used for 1) retention of water; 2) retention of seed, both broadcast and wind-blown; 3) to act as points of nucleation to facilitate vegetation; and 4) to tie the excavated area to the surrounding landscape.

15.1 Clearing, Grubbing, and Removal of Topsoil and Overburden

Vegetation, roots, and organic debris will be removed from the surface and stockpiled separately for reuse as mulch during reclamation. Clearing, grubbing, and removal of topsoil and overburden will occur within each MIM, with no greater than ten acres disturbed at any given time.

Overburden and topsoil will be stockpiled separately for backfilling and re-contouring of the surface, respectively. Stockpiled materials will be positioned to limit visibility of operations from Pipeline Road. Access to the MIM will be limited to the shared access road to limit environmental damage. Initial activities would include berming the disturbance areas, clearing vegetation, topsoil and overburden removal and stockpiling, and preparing the MIM for mining operations.

Erosion control BMPs (e.g. straw bales, waddles, etc.) will be used when appropriate to mitigate erosion. Overburden and topsoil will be placed in the proper order during backfilling and final grading operations as quickly as possible once mining operations cease in a given MIM. Rocks, when present and where useful for reclamation, will be positioned in a manner that is visually compatible with the surrounding terrain and for use as an erosion control measure. During active mining operations, vehicle traffic will remain within designated areas. Cross-country vehicle traffic outside the MIM or established access roads will not be allowed unless approved by BLM and MMD.

15.2 Restoration of Excavated Areas

Restoration of mined areas involves backfilling of the excavation with stockpiled overburden and topsoil, recontouring, erosion control, and reestablishment of vegetation.

15.2.1 Backfilling

Stockpiled overburden will be used to backfill excavations. The surface will be recontoured with topsoil and tied to the surrounding terrain. The surface will be scarified to produce a rough surface to retain moisture and capture and retain broadcast and windblown seed.

15.2.2 Recontouring

Backfilled slopes will be no greater than 3H:1V. All effort will be applied to minimize slope gradient and to apply mulch from the existing stockpile to mitigate erosion. Final slopes of all reclaimed areas will not exceed 3H:1V. All temporarily disturbed areas within mined areas and roads will be recontoured and tied to the surrounding terrain. Recontouring will emphasize restoration of the existing drainage and landform to pre-mining conditions, to the extent practicable.

15.2.3 Mulch

Stockpiled vegetation, roots, and organic debris will be used as mulch on the recontoured surface to preserve soil-moisture, reduce surface temperatures, and facilitate revegetation. Rocks, when present and where useful, will be used for erosion control.

15.2.4 Moisture Retention and Seed Entrapment

Moisture retention by means of earthen-berms or furrows will reduce and confine the flow of surface water. Water traps can be installed to provide erosion control and moisture retention to support vegetative growth. Water traps usually consist of a low profile (e.g one-foot high) berm with an upslope swale, gently angled downslope to divert surface runoff to a stable infiltration or retention point. These water traps can also act as seed traps to capture and retain broadcast and wind-blown seed.

The purposes of water traps are:

- To decrease surface water velocities over reclaimed lands by reducing slope lengths;
- To remove surface water from a reclaimed area in a controlled manner and at frequent intervals to reduce its erosive power;
- To direct surface water to a stable area to minimize surface erosion; and
- To maximize moisture infiltration on reclaimed areas.

15.2.5 Wildlife Shelters

Vegetation that is removed and stockpiled during clearing operations may be reused to construct wildlife habitat (shelter) structures. These shelters, constructed after seeding, could be placed within the reclaimed area as a wildlife habitat enhancement measure. In addition to augmenting habitat, shelter development would supplement other erosion controls, provide a trap for seed

recruitment from adjacent vegetation, and minimize soil temperatures, allowing for increased moisture retention to facilitate revegetation.

15.2.6 Invasive/Noxious Species Control

In order to promote ecosystem health, expansion of weeds must be controlled. Invasive species can dominate sites and often impact native plant communities. If not controlled, noxious species can jeopardize the success of reclamation. However, temporary species growth can provide erosion control and soil stability by means of added root density and depth. As native plants develop, invasive species typically subside. Invasive species growth will be monitored during reclamation and controlled as appropriate to promote revegetation.

15.2.7 Closure

All mining equipment and infrastructure will be removed upon completion of mining activities and closure of the PA. Disturbed surfaces, access roads, and MIMs will be tied to the surrounding terrain contour as much as practicable. All disturbed areas will be revegetated using a seed mix specified by BLM FFO.

15.3 Revegetation

Vegetation within the proposed PA varies according to elevation, soil physiology, topography, climatic conditions, and land management practices. The seed mix would be designed as needed for specific purposes and areas.

Proposed seed mixes will emulate the climax ecological community currently found in the PA. Disturbed areas will be seeded using a seed mix specified by BLM FFO representative of communities that existed prior to surface disturbance in the area.

The criteria used for selecting the seed mix are based on the following:

- Restoration performance of species within a similar soil physiology and/or habitat;
- Erosion-control capability;
- Existing plant dominance;
- Availability of seed;
- Habitat value; and
- Livestock management.

Seeds of high purity, percent live seed, and weed free will be used to ensure compliance with BLM seed requirements.

15.3.1 Experimental Revegetation Plots

Miocene proposes that experimental plots be established, when operationally appropriate and viable, at mutually agreeable locations to evaluate alternative revegetation techniques and the efficacy of man-made, enhanced moisture retention features and natural seeding. These studies would provide valuable information for future reclamation activities not only in this area but in other areas administered by the BLM.

Reclamation goals are to reclaim disturbed areas as self-sustaining, ecological communities that emulate the surrounding climax, ecological community. Evolution to this climax state will start with the application of an appropriate seed mix matched to the soil physiology. Miocene would

like to establish experimental plots to determine the efficacy of enhanced moisture retention features and natural seeding using “man-made depressions.” The grouser technique consists of using the tread (grousers) on Caterpillar track equipment to create linear depressions in the topsoil perpendicular to contour and the prevailing wind direction. The depressions allows for capture and preservation of moisture and wind-transported seed from existing shrubs and grasses by prevailing west-southwest winds. The “furrow” technique or furrowing, in essence, is an amplification of the grouser technique by means of creating deeper linear depressions for moisture and seed capture (analogous to farm furrows). Miocene proposes establish such plots to monitor growth efficiency and report to the BLM the optimum approach with the goal of reclaiming the PA “as good as or better” than the visual quality of the surrounding the climax, ecological community.

Techniques employing surface roughening and scarification will be employed in the most practical instances. Extreme roughening will be utilized when practical to ensure wind-blown seed is captured in the most effective manner possible.

16.0 POST-RECLAMATION MONITORING

Reclaimed areas within the proposed PA will be monitored for vegetative success. Reseeding will occur as warranted to achieve vegetation goals. Invasive and transient species shall be monitored and if warranted, removed or treated.

The purpose of post-rehabilitation monitoring is to evaluate the long-term soil stability, vegetative cover and density, habitat quality, and levels of noxious and invasive weeds in the PA. The primary goals and objectives of monitoring are:

- Assess the effectiveness of erosion-control structures on the stability of the PA. Natural runoff control, with no accelerated erosion or wash-outs will be evaluated. The first-year monitoring would focus on qualitative analysis of the reclamation efforts. Locations where additional remedial work may be required should be apparent and would be identified and addressed. Monitoring of the PA for significant and/or new erosion or third-party damage is an element of Miocene’s routine surveillance that would be conducted throughout the monitoring period. It is anticipated that any active erosion would be apparent during the first year following reclamation or after the first runoff event.
- Monitor the efficacy of reclamation efforts visually, if applicable, and the extent to which the restored area emulates the climax, ecological community.
- Monitor and assess targeted noxious weeds and invasive species.
- Monitor and identify other disturbances that may hinder reclamation success, such as excessive livestock and wildlife grazing or unauthorized land use.
- Identify places where other vegetation control may be needed. Note that with the exception of noxious weed control, vegetation maintenance, including mowing of non-agricultural lands or tree removal, is not anticipated.

16.1 Remedial Action and Monitoring

Miocene will address identified erosion problems as soon as practical based on evaluation of surface conditions. Additional erosion control work may be performed by applying the same basic reclamation techniques identified in this plan, based on site-specific conditions. It is also noted that temporary erosion control structures, such as straw bale or sediment barriers, would be removed when sites are deemed stable and reclamation is determined to be successful. Reseeding or replanting efforts, including supplemental mulching if necessary, would occur, with the agreement of the BLM in any area where monitoring during the second growing season identifies a reclamation failure, particularly where accompanied by observed increases in water or wind erosion.

16.2 Final Permit Area Closure and Bond Release

When reclamation has been deemed adequate by the BLM-FFO and EMNRD-MMD, the BLM and EMNRD will release the liability and bond and the PA will be terminated according to BLM policy.

Affirmation:

I affirm that the above statements are true and accurate to the best of my knowledge and belief.

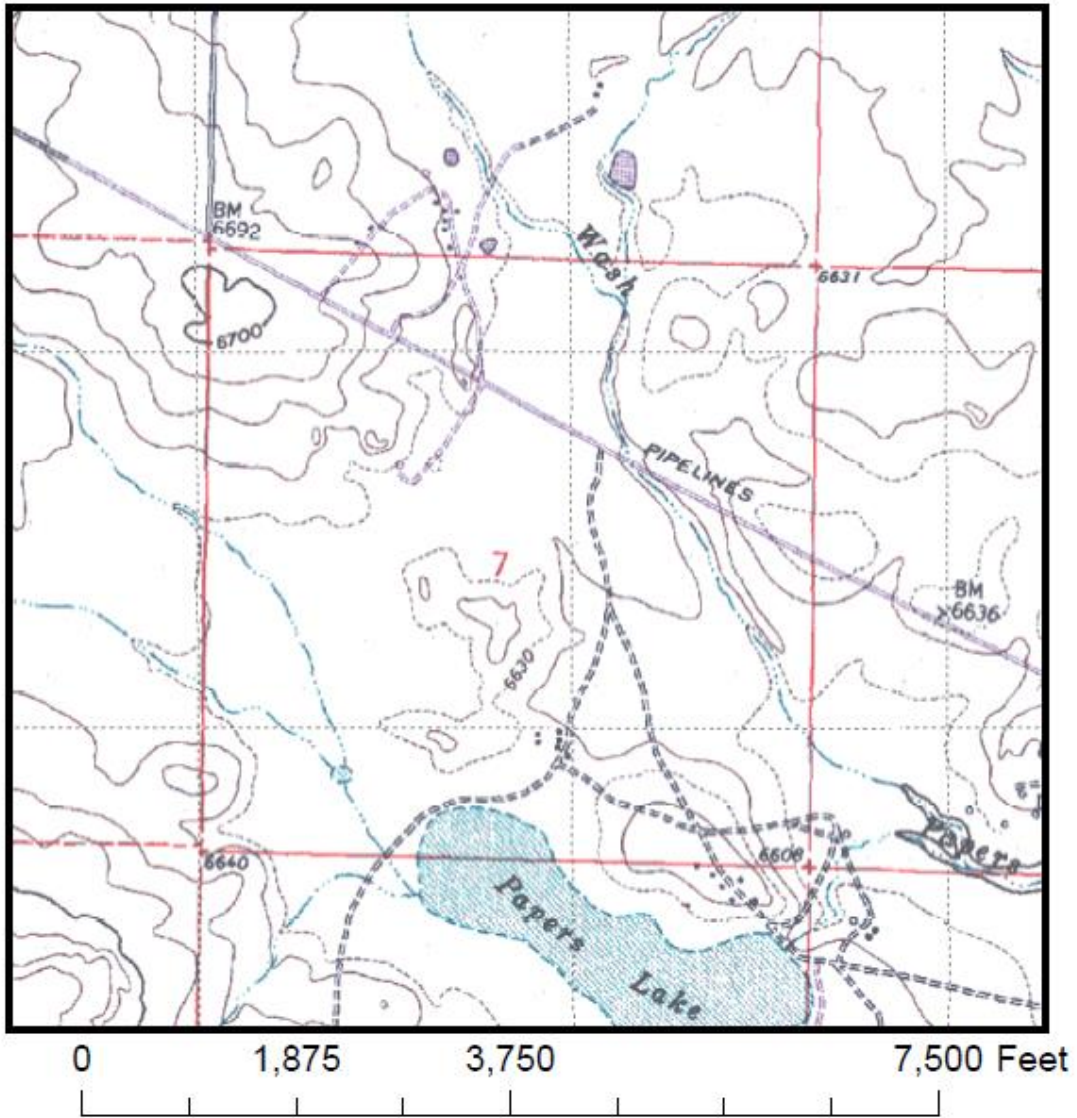
Company Name

Date

Authorized Agent Signature

Printed Signature

Figure 1. Topographic Map of Proposed Section 7 Mine
Section 7. Township 19N. Range 5W
Mining Area
Topographic Map



1:15,000

Figure 2. Proposed Section 7 Mine Acreage

Section 7, 19N, Range 5W
Area of Interest

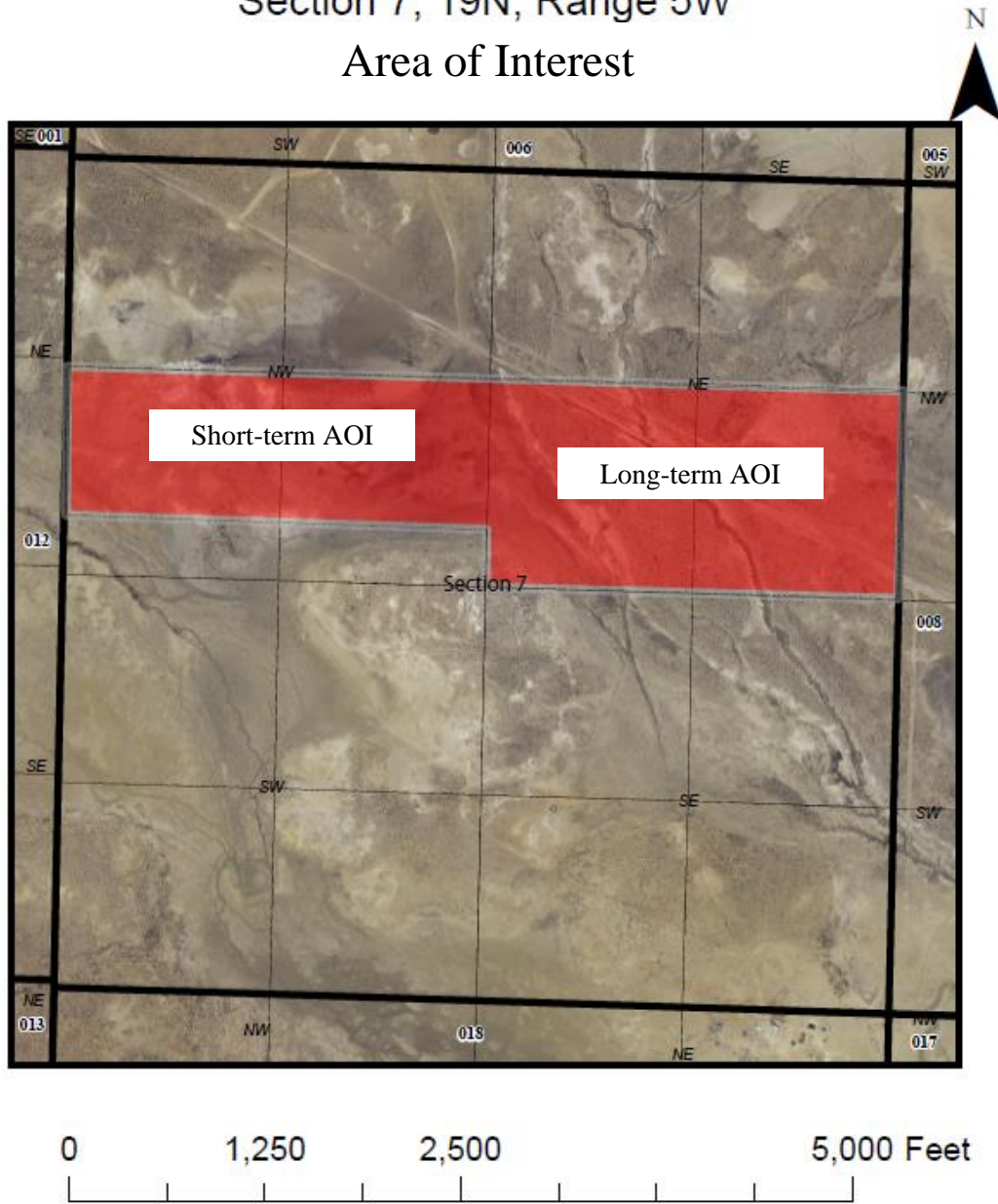
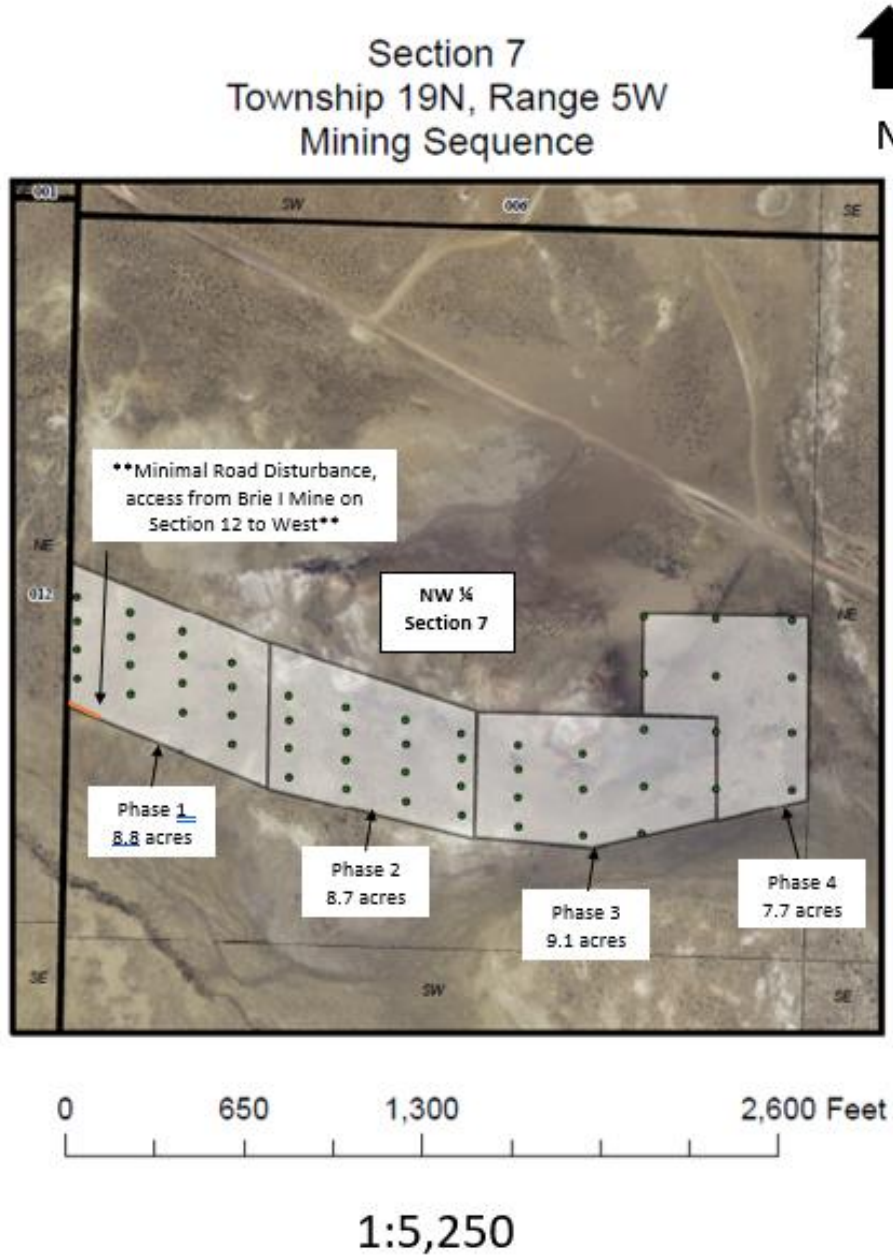


Figure 3: Proposed 10-acre mining sequence



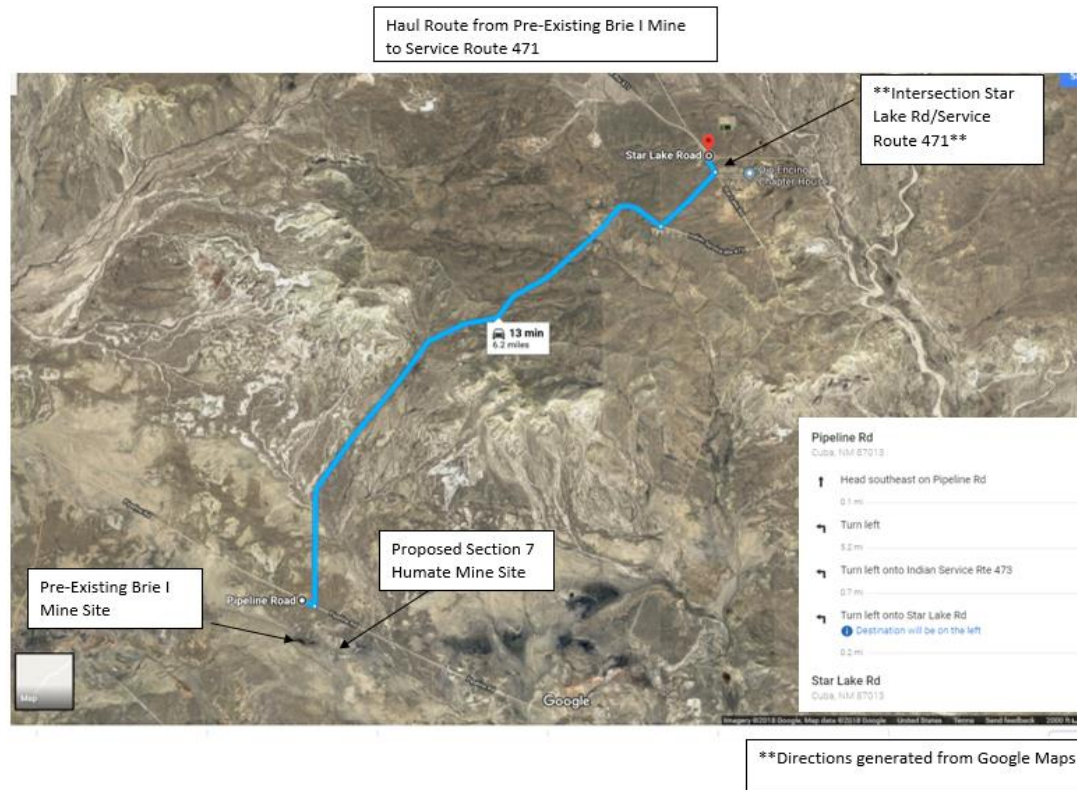


Figure 5: Haul Route from Mine Site to Service Route 471 and Star Lake Rd Intersection

Haul Route from Star Lake Rd/Service Route 471 to Cuba, NM



**Directions generated from Google Maps

Figure 5: Haul Route Service Route 471 and Star Lake Rd Intersection to Cuba, NM

Appendix E: Paleontological Survey Report



OBERT M. SULLIVAN, Ph.D.

Paleontologist, Geologist and Paleontology Consultant

field services ● consulting ● museum exhibition ● research

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18 May 2016

Mr. Phil Gensler Regional Paleontologist

P.O. Box 27115
Santa Fe, NM 87502-0115

**RE: Paleontological Resources Survey Report for the BLM; Humate Mine Project – Marron & Assoc.,
Albuquerque, NM**

Dear Phil,

I completed the survey for paleontological resources in the northern part of Sec. 7 (S½, NW1/4, S½, NE1/4), Star Lake, N.M., USGS 7.5 minute quadrangle (Fig. 1), on May 11th, 2016, under the BLM Paleontological Resources Use Permit: NM 14-08C. The following is a summary of my survey of this area.

The exposures of the project area are the Upper Cretaceous upper Fruitland Formation. Generally, the Fruitland Formation exposures were limited within the project area. In the eastern part of the project area (S1/2 of NE1/4, Sec. 7), the exposures of the Fruitland Formation were largely covered with Quaternary sands and sage brush, northeast of the pipeline road. Southwest of the pipeline road, the area was relatively flat and mostly covered by grasses and sagebrush. Here, a small arroyo (Salazar Arroyo) cuts through the Quaternary sands and the underlying Fruitland Formation. Exposures along the arroyo bank were not fossiliferous, as were the eastern half of the project area.

The Fruitland Formation was best exposed in the northern half of the western half in the project area. Mounds of resistant sandstone outcrop in couple of places, but in general, the surface is relatively flat, consisting mostly of shale. The shales were typically dark grey to brown, carbonaceous, interbedded with localized lignite/coal beds (Fig 2).

Sandstone lenses also cropped out in places, as well as some limited clinker exposures. The south part of the project area (in the western half) consisted mostly grassy flat expanse, sloping slightly towards Papers Wash to the south.

Petrified wood, consisting mostly of small, broken pieces, were present in the northwestern part of the project area (Fig. 3). There were some larger specimens of petrified wood, but they were limited, not well preserved and are not considered significant (Fig. 4). Some poorly preserved fossil plant material was also encountered, but this, too, is not significant. No invertebrate fossils or trace fossils were found. There was no evidence of any fossil vertebrates in the project area, thus no fossils were collected.

Sincerely yours,

A handwritten signature in black ink that reads "Robert M. Sullivan". The signature is written in a cursive style with a long, sweeping tail on the final letter.

Robert M. Sullivan, Ph.D.
Paleontology Consultant

CC: Paul Knight, Marron & Associates

DRAFT

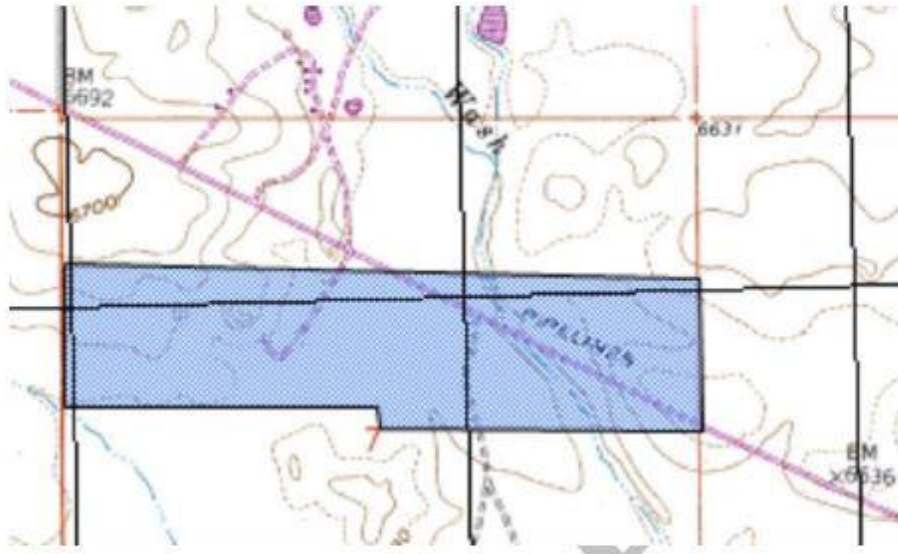


Fig. 1. Project area, northern part of Sec. 7 (S $\frac{1}{4}$, NW $\frac{1}{4}$, S $\frac{1}{4}$, NE $\frac{1}{4}$), Star Lake, N.M., USGS 7.5 minute quadrangle.



Fig. 2. Lignite/coal lens and carbonaceous shale, Fruitland Formation, northern half of south half,

NW1/4 of Section 7, T19N, R5W.



Fig. 3. Small pieces of petrified wood, Fruitland Formation, northern half of south half, NW1/4 of Section 7, T19N, R5W.

DRY

Appendix F: National Environmental Policy Act Interdisciplinary Team Checklist

INTERDISCIPLINARY (ID) TEAM CHECKLIST

Farmington Field Office

(EAs & DNAs) - The purpose of this checklist is to document which resource issues need analysis in the NEPA document and to identify the ID team for the NEPA document. Responsible staff will make an initial determination and provide rationale for that determination, which is subject to manager review and concurrence. If warranted, issues or determinations may be changed during the NEPA process (e.g., after external scoping, during review, etc.), but changes must be documented and have Authorized Officer concurrence. All elements need a determination, assigned specialist, rationale, initials, and date. The ID team will include all specialists with a "PI" in the table below, and resources with a "PI" will be addressed in Ch. 3 of the EA.

(CXs) - The purpose of this checklist is to identify the ID team for the categorical exclusion (CX). The ID team will help the project lead develop mitigation measures and determine if extraordinary circumstances apply. DO NOT enter a determination, initials, or date for CX projects. Specialists may provide mitigation measures or extraordinary circumstances in the "Rationale for Determination" column, but it is not necessary at this time.

Project Title: Miocene Section 7 Humate Mine Project

NEPA Number: DOI-BLM-NM-F010-2018-0117-EA

File/Serial Number:

Project Leader: Tony Gallegos, Chris Wenman

DETERMINATION OF STAFF: (Choose one of the following abbreviated options for the left column)

- PI = Present with potential for relevant impacts that need to be analyzed in Ch. 3 in the EA.
- NP = Not present in the area impacted by the proposed or alternative actions
- NI = Present, but not impacted to a degree that analysis is required in Ch. 3 in the EA.
- NC = (DNAs only) Actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section D of the DNA form. The Rationale column may include NI and NP discussions.

Determination	Resource	Assigned Specialist (X)	Rationale for Determination ¹	Initials ²	Date ³
RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)					
PI	Air Quality/	(x) W. Thomas () J. Tafoya	How would construction and operation activities of the Humate Mine affect the VOCs and NAAQS in the Farmington Field Office?	WT	6/5/2019
NI	Greenhouse Gas Emissions	(x) W. Thomas () J. Tafoya	Impacts to air quality and greenhouse gas emissions associated with the Proposed Action would result from increased exhaust emissions from vehicles and heavy equipment used during the mining and transporting of material for the life of the mine. There would also be a minor increase in dust emissions during mining and transportation operations for the duration of mining and reclamation activity. Miocene's Mine Plan includes a design feature to suppress dust generation through application of water to roadways and/or material stockpiles during the life of the mine. In the Analyzed in Brief section briefly describe how the construction and operation of the Humate Mine would affect GHGs within New Mexico and the United States.	WT	6/5/2019
NI	Cultural Resources	(x) K. Adams () E. Simpson () G. Haymes	A Class III Archaeological Survey (NMCRIIS No. 135810; BLM Report No. 2017(I)003F) was conducted in the proposed project area and during this survey three archaeological sites were discovered. Two of these sites (LA185556, & LA185558) were determined to be Eligible for listing on the NRHP, and one site (LA185557) was determined to be Not Eligible for listing on the NRHP. Both of the Eligible sites will be protected by temporary fencing and archaeological monitoring and the Not Eligible site will require no further work. With the adherence of these stipulations, the proposed project will have no effect on historic properties.	KA	6/5/19
NI	Native American Religious and other Concerns	(x) K. Adams () E. Simpson () G. Haymes	The proposed project location is outside of any known TCPs or areas with Native American religious concerns. Native American Religious and Other Concerns within the project area will, however, be addressed in Chapter 4 of the EA following	KA	6/5/19

Page 1 of 5

INTERDISCIPLINARY (ID) TEAM CHECKLIST

Farmington Field Office

Determination	Resource	Assigned Specialist (X)	Rationale for Determination ¹	Initials ²	Date ³
			results of the ethnographic study that was requested by Navajo Nation Historic Preservation Department.		
NI	Paleontology	() S. Landon (x) C. Wenman	The proposed project is located in an area classified as PFYC 5, where the Kirtland Formation is exposed on the surface. However, no known localities are located within or near the proposed project area. The following language as a design feature would mitigate any paleontology impacts due to accidental discovery, as would minimization of disturbance to badlands type soils within the project area. The Proposed Action is not located within a Paleontological SDA identified by the 2003 BLM FFO RMP. "Any paleontological resource discovered by the Operator, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant scientific values. The Holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the Holder."	CW	6/4/2019
NP	Areas of Critical Environmental Concern	() K. Adams () E. Simpson (x) C. Wenman	The Proposed Action is located approximately 7 miles from the nearest ACEC, the Chacra Mesa Complex. No impacts to the ACEC are expected from the proposed humate mining operations due to the distance between the mine site and the ACEC.	CW	6/4/2019
NP	Lands with Wilderness Characteristics	(X) S. Allison () D. McKim	There are no Lands with Wilderness Characteristics within the proposed project area.	SA	5/24/2019
NP	Wilderness	(X) S. Allison () D. McKim	There are no Wilderness Areas within the proposed project area.	SA	5/24/2019
NI	Visual Resources	(X) S. Allison () D. McKim	Using Best Management Practices will result in the goals of VRM Class IV being met.	SA	5/24/2019
NP	Recreation	() D. McKim (X) S. Allison	Dispersed Recreation in the proposed project area should not be impacted by the proposed project. There are no Extensive or Special Recreation Management Areas within the proposed project area.	SA	5/24/2019
NI	Fuels/Fire Management	() J. Tafoya (x) C. Wenman	Future potential development within the project area would result in new surface disturbance. Noxious and invasive weeds (including cheatgrass [<i>Bromus tectorum</i>]) readily invade disturbed sites. The potential spread of cheatgrass could provide an opportunity for increased fine fuel loading and an environment conducive to wildland fires. Design features and BMPS designed reduce or eliminate the spread of noxious and invasive weeds would minimize spread of cheatgrass-associated fire potential.	CW	6/4/2019
NP	Geology	() A. Gallegos (x) C. Wenman	No Geologic resources exist within the project area for the Proposed Action.	CW	6/4/2019
NI	Solid Mineral Resources	() A. Gallegos (x) C. Wenman	The Proposed Action would result in removal of saleable solid mineral resources in the form of humate located within the project area.	CW	6/4/2019

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INTERDISCIPLINARY (ID) TEAM CHECKLIST

Farmington Field Office

Determination	Resource	Assigned Specialist (X)	Rationale for Determination ¹	Initials ²	Date ³
NI	Oil and Gas / Energy Production	() S. Scott () M. Wirth (x) C. Wenman	The Proposed Action is located within active oil and gas lease number NMNM-125255 administered by the BLM FFO. The existing lease is currently held by production. There are currently no oil and gas wells located within the immediate project area. Future oil and gas potential in the Project Area is low per the 2018 Reasonably Foreseeable Development Scenario, so the potential for conflicts of interest within the proposed mine area and the active lease area are minimal.	CW	6/4/2019
NI	Lands/Access	() K. White Bull () M. Tilden () T. Faust	The Proposed Action would not interfere with Realty actions. Any proposals for future ROW projects associated with the Proposed Action would be reviewed on a site-specific basis. Coordination with existing ROW holders and application of standard operating procedures, design features, BMPs, and stipulations would ensure protection of existing ROW corridors.	CW	6/4/2019
NI	Wastes (hazardous or solid)	() W. Thomas () A. Gallegos (x) C. Wenman () G. Smith	The Mine Plan associated with the Proposed Action describes the methods for proper handling and disposal of any wastes that would be generated during mining operations.	CW	6/4/2019
NI	Livestock Grazing	() B. Witmore () C. Gould () N. Craun () J. Tafoya (x) A. Yemma	Surface disturbance and soil removal associated with mining of humate within the project area would impact forage availability and livestock grazing operations within the Star Lake Community (06023) grazing allotment. However, impacts to livestock grazing are anticipated to be negligible due to the Minimum Impact Mine, where no more than 10 acres of disturbance would occur at one time, and the over-grazed vegetation existing at the site.	AY	6/5/2019
NI	Public Land Health Standards	() B. Witmore () C. Gould () N. Craun () J. Tafoya (x) A. Yemma	Impacts to rangeland health are anticipated to be negligible with implemented design features, particularly those specific to reclamation.	AY	6/5/2019
NI	Invasive Species/ Noxious Weeds	(x) H. Perry	Design features outlined in the Mine Plan provided by Miocene would address the potential impacts from surface disturbance and potential establishment and distribution of noxious weeds and invasive species.	CW	6/4/2019
NI	Vegetation Excluding USFWS Designated Species	() B. Witmore () C. Gould () N. Craun () J. Tafoya (x) A. Yemma	Up to 40 acres of vegetation primarily in the BLM FFO sagebrush grassland and grassland communities, would be removed under the Proposed Action. Miocene's Minimum Impact Mining technique outlined in the Mine Plan indicates that disturbance and reclamation will occur in progressive blocks less than 10 acres in size, minimizing impacts to vegetation. The Mine Plan includes a Reclamation Plan that would ensure all disturbed areas associated with the Proposed Action are restored to a condition emulating the surrounding vegetative community. Vegetation impacts are addressed in the livestock grazing section of the checklist.	AY	6/5/2019
NI	BLM Sensitive Species (including sensitive raptor species)	(X) J. Kendall	No known habitat for SSS	JK	6/5/19

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Farmington Field Office

Determination	Resource	Assigned Specialist (X)	Rationale for Determination ¹	Initials ²	Date ³
NI	USFWS Threatened, Endangered or Candidate Species	(X) J. Kendall	Within compliance of BA for 2003 RMP	JK	6/5/19
NI	Migratory Birds	(X) J. Kendall	Minimal impacts to migratory birds due to lack of nesting habitat and nature of the project activities.	JK	6/5/19
NI	Wildlife	(X) J. Kendall	The potential impacts of the Proposed Action on terrestrial wildlife are covered under the Special Status Species Animal section. No other impacts to terrestrial wildlife are expected. No known populations of big game species are present with the project area.	JK	6/5/19
NP	Wetlands/Riparian Zones	(X) J. Kendall	No wetlands or riparian zones exist within or near the location of the Proposed Action.	JK	6/5/19
NI	Water Resources/Quality (drinking/surface/ground)	(X) W. Thomas	Water usage associated with the Proposed Action is minimal, water would only be used as a dust suppression technique as described in the Mine Plan. A Storm Water Pollution Prevention Plan (SWPPP) was prepared for the project and includes storm water control BMPs that would minimize potential of a change in run-off or run-on within the mine area. BMPs, which may include silt fencing, hay bales, straw wattles, or other features, would also minimize erosion and increased sediment load within the project area.	WT	6/5/2019
NP	Soils	(X) W. Thomas	The proposed Section 7 Humate Mine project is located outside of identified fragile soils per a GIS review and known on-site conditions of the proposed project. The BLM FFO does not manage soils outside of identified fragile soil zones. The project would result in removal of topsoil, overburden, and humate from the surface during mining. The reclamation plan would ensure that removed top soil and overburden are replaced upon reclamation, mitigating any impacts from soil removal.	WT	6/5/2019
NP	Wild Horses and Burros	() J. Tafoya () B. Witmore () C. Gould () N. Craun (X) C. Wenman	No Congressionally-designated populations of wild horses or burros exist within or near the project area.	CW	6/4/2019
PI	Socio-Economics	(X) L. Henio	How would the Proposed Action impact the Socio-Economics of the BLM FFO regional management area?	LH	6/5/2019
PI	Environmental Justice	(X) L. Henio	How would the Proposed Action impact minority or economically disadvantaged communities or populations?	LH	6/5/2019

¹ Rationale for Determination is required for all "NIs" and "NPs." Write brief issue statements for "PIs."

² The appropriate resource specialist or Authorized Officer or NEPA Coordinator entering the determination should enter their initials. Typically, the assigned specialist should enter initials. If a senior specialist or the Authorized Officer assigns a resource specialist to the NEPA project, the senior specialist or Authorized Officer shall enter their initials in this column after making a determination. If the assigned specialist is making the determination from an off-site location (i.e., state office), the project lead may enter their own initials as long as the determination is documented (i.e., email, conversation record, etc.). DO NOT enter someone else's initials.

³ The date entered should be the date the determination was made by the assigned specialist, senior specialist, or Authorized Officer.

PROJECT-ASSIGNED SPECIALISTS REVIEW:

Reviewer Title	Initials ⁴	Date	Comments
NEPA Coordinator or Supervisor			

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Farmington Field Office

⁴ Initials in this column indicates that the NEPA Coordinator has reviewed the assigned specialists column and agrees that the specialists that have been assigned or that have entered PIs (for EAs) will be included in the ID Team for the project. This section is typically initialed at the initial project presentation meeting.

INITIAL DETERMINATION REVIEW (*EA or DNA only*):

Reviewer Title	Initials ⁵	Date	Comments
NEPA Coordinator or Supervisor			

⁵ Initials in this column indicates that the Authorized Officer or NEPA Coordinator has reviewed the completed checklist after the ID Team entered initial determinations, and the project lead may continue the NEPA process. Initials will not be made here for categorical exclusions (CXs).