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# Black Spring Humate Mine Expansion Project

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Environmental Assessment  
DOI-BLM-NM-F010-2023-0068-EA  
Applicant: Menefee Mining Corporation

**Sections 04 and 09, Township 19 North, Range 05 West,  
McKinley County, New Mexico**

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# 1 Introduction

## 1.1 Summary of Proposed Action

Menefee Mining Corporation (Menefee) has submitted a mining and reclamation plan to the Bureau of Land Management (BLM) Farmington Field Office (FFO) for the proposed Black Spring Humate Mine Expansion Project. The proposal includes the expansion of Menefee's existing Black Spring Humate Mine (a shallow surface mine) located on BLM-managed surface and mineral estate near the community of Ojo Encino in McKinley County, New Mexico (NM). 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 expanded permit area within the currently operating Black Spring Mine permit. The BLM would administer the proposal in accordance with applicable laws and agency policies regulating the disposal of saleable federal minerals.

Menefee is proposing to expand their existing Black Spring Humate Mine by approximately 117 acres. Additionally, they are requesting to increase the mine's current design limit from 10 to 12 acres. The Black Spring Mine is located 30 miles southwest of Cuba, NM, and four miles south of the community of Ojo Encino, in Section 4, Township 15N, Range 5W, NM Principal Meridian (NMPM), McKinley County, NM.

As proposed, the Black Spring Mine Permit Area Expansion Project (Proposed Action) would be located immediately west of the existing Black Spring Mine in Sections 4 and 9, Township 19 North, and Range 5 West, NMPM and would provide an additional 117 acres for humate mining (see **Figure A.1**, **Figure A.2**, and **Figure A.3** in Appendix A). Menefee anticipates the addition of 117 acres would provide sufficient access to the underlying humate resource for mining operations to continue for approximately 10-15 years (depending on rate of mining).

Currently, operations at the mine are subject to a design limit that limits the amount of open, active surface disturbance to 10 acres. Once the humate from a 10-acre section is extracted, the section must be reclaimed prior to commencing mining in the next 10-acre section. Menefee is proposing to increase the current design limit from 10 to 12-acres. Upon BLM's decision, Menefee will submit this design limit increase to the State of New Mexico Energy, Minerals and Natural Resources Department's (NMEMNRD), Mining and Minerals Division (MMD) through Permit Modification 22-1. The increase in design limit will allow Menefee more flexibility in their mining operations for moving and storing topsoil.

This environmental assessment (EA) has been developed to disclose potential site-specific impacts from the sale and mining of federal mineral materials managed by the BLM per the requirements of the National Environmental Policy Act (NEPA). The proposed Menefee mine expansion area is shown in **Figure A.1**, **Figure A.2**, and **Figure A.3** in Appendix A. The following federal regulations and BLM policies provide the regulatory framework and authority for the BLM's jurisdiction over the disposal of mineral materials under the Proposed Action:

- The Materials Act of 1947 (30 United States Code [USC] 601 et seq.)
- Part 3600–Mineral Materials Disposal under Title 43 of the Code of Federal Regulations (CFR) (43 CFR Part 3600)
- BLM Mineral Materials Disposal Handbook H-3600-1

## 1.2 Purpose and Need

The purpose for the BLM is to respond to the mining operations and reclamation plan and application for a Mineral Materials Contract submitted by Menefee to mine saleable solid minerals (humate) managed by the BLM Farmington Field Office (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 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 Decision to Be Made

Based on the information in this EA, the BLM FFO will decide whether to approve the mining operations 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 (ROD), 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 federal 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 mineral 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 2003).*

This EA incorporates by reference the information and analysis contained within the RMP. The RMP and 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 RMP (BLM 2003). The Proposed Action would not conflict with any local, county, or state plans.

## 1.5 Relationship to Statutes, Regulations, and Other NEPA Documents

Various federal and state agencies regulate different aspects of oil and gas infrastructure development. Table 1.1 provides a selected list of relevant permits, regulations, and approvals that could be required for

the Proposed Action. The area of the proposed humate mine expansion was previously analyzed for humate exploration under Categorical Exclusion document number DOI-BLM-NM-F010-2022-0063-CX, titled Black Springs Humate Section 4 & 9 Exploration Project. Results of the exploration project helped inform the proposed mine expansion area analyzed in this EA.

**Table 1.1. Permits, Regulations, and Approvals Relevant to the Proposed Action**

Permit/Regulation/Approval	Issuing Agency	Status
<b>Federal Permit, Approval, or Clearance</b>		
Mineral Material Contract and associated Mining and Reclamation Plan	BLM	The application is currently under review by the BLM and are the subject of this EA.
Section 7 of the Endangered Species Act (ESA)	U.S. Fish and Wildlife Service (USFWS)	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 FFO RMP (BLM 2003). No endangered or threatened species listed under the ESA or designated critical habitat were observed during the general biological surveys.
BLM Manual 6840	BLM	Manual 6840 directs the BLM to initiate proactive conservation measures that reduce or eliminate threats to BLM sensitive species to minimize the likelihood of and need for listing of these species under the ESA (BLM 2008a). Biological survey results and mitigation measures utilized in the proposal to avoid or lessen impacts to BLM sensitive species are discussed in this EA.
Federal Noxious Weed Act (Public Law 93-629; 7 USC 2801 et seq. 88 Statute 2148)	BLM	Prior to construction activities, the proponent would adhere to the BLM's standard noxious weed procedures. Menefee would follow all guidance outlined in its pesticide use proposal (PUP) approved by the BLM FFO.
Paleontological Resources Preservation Act of 2009 (Act) (Sections 6301–6312 of the Omnibus Public Lands Act of 2009, 16 USC 470aaa)	BLM	Table 1.3 and Appendix F describe results of the paleontological survey performed for the project area.
CWA Section 404 Permitting Discharges of Dredge or Fill Material into Waters of the United States (WOTUS) (including wetlands)	U.S. Army Corps of Engineers	Jurisdictional WOTUS features are not present within the proposed project areas. The proponent would be responsible for adhering to Section 404 (dredge and fill) of the CWA, including any required permitting actions with the U.S. Army Corps of Engineers for any impacts within potential surface water features prior to construction, if applicable.
Section 106 of the National Historic Preservation Act	BLM*	Table 1.3 describes potential impacts to cultural resources. Any required further consultation with the State Historic Preservation Office would be conducted by the BLM.
<b>State Permit, Approval, or Clearance</b>		
New Mexico Executive Order 00-22 (regarding noxious weeds)	New Mexico Department of Agriculture	Prior to construction activities, the proponent would adhere to the BLM's standard noxious weed procedures. Menefee would follow all guidance outlined in its PUP approved by the BLM FFO.
Clean Air Act New Mexico Air Quality Control Act	NMED	Impacts to air quality are described in Table 1.2. The Proposed Action would not require an air permit from NMED.

Permit/Regulation/Approval	Issuing Agency	Status
CWA Section 401 Water Quality Certification	NMED Surface Water Quality Bureau	Jurisdictional WOTUS features are not present within the proposed project areas. The proponent would be responsible for adhering to Section 401 (water quality certification) of the CWA, including any required permitting actions with the NMED Surface Water Quality Bureau for any impacts within potential surface water features prior to construction, if applicable.
<b>Local Permit, Approval, or Clearance</b>		
Executive Order 11988 Floodplain Management	County Floodplain Commissioners	No Federal Emergency Management Agency floodplains are in the proposed project areas. The proponent would be responsible for adhering to Executive Order 11988 (floodplain management) of the CWA, including any required permitting actions with the local County Floodplain Commissioners for any impacts within potential surface water features prior to construction.

\* The BLM is the agency that oversees compliance.

## 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 May 23, 2023, with a follow-up meeting on June 20, 2023. Tables 1.2 and 1.3 describe issues identified for analysis in brief or issues identified but eliminated from analysis. An additional meeting was held with BLM FFO on October 3, 2024, to further discuss air quality. It was decided that based on the emissions calculations completed that a detailed analysis would not be required (*Personal Communication*, Jeff Tafoya, BLM FFO Assistant Field Office Manager, and Adam Deppe, New Mexico Air Quality Specialist, BLM New Mexico State Office, October 3, 2024).

### 1.6.2 External Scoping

A BLM on-site visit occurred on December 7, 2021, when the project area was under review for exploration prior to expansion (*Personal Communication*, Chris Wenman, BLM FFO Supervisory Natural Resource Specialist, email April 29, 2024).

The BLM FFO initiated external scoping for the proposed project by posting the Proposed Action on the BLM National NEPA Register ePlanning website (<https://eplanning.blm.gov/eplanning-ui/project/2033534/510>) (BLM 2024) for public review beginning July 11, 2024. This listing included a description of the Proposed Action and a description of the proposed project location.

## 1.7 Issues Identified for Analysis in Brief

During the scoping process, the BLM FFO developed a list of issues to analyze within this EA. Following further review; however, no issues were identified that would require detailed analysis (*Personal Communication*, Jeff Tafoya, FFO Assistant Field Office Manager, and Adam Deppe, New Mexico Air Quality Specialist, BLM New Mexico State Office, October 3, 2024). Details on issues identified for analysis in brief are in Table 1.2.

**Table 1.2. Issues Identified for Analysis in Brief**

Issue Statement	Analysis in Brief
How would emissions that are generated by equipment associated with the proposed project impact air quality?	<p>The Clean Air Act (CAA) requires the EPA to set NAAQS for six criteria air pollutants considered harmful to public health and the environment: carbon monoxide (CO); nitrous dioxide (NO<sub>2</sub>); ozone (O<sub>3</sub>); particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>); sulfur dioxide (SO<sub>2</sub>); and lead (Pb). Nitrogen oxide (NO<sub>x</sub>) and volatile organic compounds (VOC) emissions also contribute to secondarily formed pollutants of O<sub>3</sub> and PM<sub>2.5</sub> through a complex series of atmospheric chemical interactions. The CAA categorizes NAAQS as “primary” or “secondary.” Primary standards provide public health protection, including the health of at-risk populations, with an adequate margin of safety (EPA 2024b), and secondary standards provide for public welfare, including protection against degraded visibility and damage to animals, crops, vegetation, and buildings (EPA 2024b). A detailed description of these pollutants, along with their health effects and their sources, can be found in Chapter 3 of the Air Resources Technical Report (BLM 2023a).</p>

Mining activities associated with the Proposed Action would result in the release of emissions from the operation of internal combustion engines, as well as the emission of particulates (specifically PM<sub>10</sub> and PM<sub>2.5</sub>) 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. The mine 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 Black Spring 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.

Table 1.2a shows estimated modeled emissions from operation of the Mine expansion over one year of operations (assuming 12 acres of disturbance/year over a 10-year period to cover the 117-acre expansion area in a maximum emissions scenario) and the percent increase in criteria pollutants over existing conditions. Emissions calculations in Table 1.2a are based on estimates submitted through EMIT by Menefee.

**Table 1.2a. Criteria Pollutant Emissions from Operation of the Black Springs Humate Mine Expansion**

	Total Emissions (tons per year)					
	PM <sub>10</sub>	PM <sub>2.5</sub>	VOC	NO <sub>x</sub>	CO	SO <sub>x</sub>
Current emissions (San Juan, Sandoval, Rio Arriba, and McKinley Counties)	24,218	6,042	141,794	53,708	108,755	2,301
Emissions from proposed mine expansion	16.33	2.34	0.013	0.12	0.088	0.0003
<b>Percent increase compared to current emissions</b>	<b>0.07</b>	<b>0.04</b>	<b>0.000009</b>	<b>0.0002</b>	<b>0.00008</b>	<b>0.00001</b>

Total HAP emissions from operation of the proposed humate mine are projected to be 0.002 tons per year. Source: Menefee and EPA (2023a).

The Proposed Action would lead to an increase in annual emission levels, but the increase would be low (less than 0.07% of any criteria pollutant). 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.



Issue Statement	Analysis in Brief
How would construction, drilling and completion activities associated with the Proposed Action contribute to greenhouse gas (GHG) emissions?	<p>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. The project, as proposed, would utilize an existing access road and utilize ongoing transport operations. The Proposed Action could lead to emissions of CO<sub>2</sub>, CH<sub>4</sub>, and nitrous oxide (N<sub>2</sub>O), the three most common GHGs, during operation.</p> <p>If the entire 117-acre permit area were developed in a 10-year period (a maximum emissions scenario), carbon dioxide equivalent (CO<sub>2</sub>e) emissions are estimated to be 462.27 metric tons over the mine life, or 46.2 metric tons CO<sub>2</sub>e per year. 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 0.71% when compared to 2016 nation-wide emissions of 6,511 million metric tons (MMT) (EPA 2018b).</p> <p>The estimated increase is minimal when compared to other sources and the nation-wide emissions, and therefore, does not represent a significant increase, as a result, no further analysis is necessary.</p>

## 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 includes a detailed explanation of remaining issues that were discussed, but will not be further analyzed in this EA.

**Table 1.3. Issues Identified but Eliminated from Detailed Analysis**

Issue Statement	Rationale for Not Further Discussing in Detail in the EA
How would proposed ground-disturbing mining activities impact cultural resources?	<p>There are no Chaco Culture Archaeological Protection Sites or United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites within or near the Proposed Action’s area of potential effect (APE).</p> <p>A Class III Archaeological Survey (De Cunzo 2021) was conducted for the proposed project. Five previously recorded archaeological sites (LA 34765, LA 34767, LA 169207, LA 169208, and LA 169751); one newly recorded archaeological site (LA199130); and seven isolated manifestations (IMs) were documented and evaluated within the APE. Of the sites, LA 169207 and LA 199130 are recommended as undetermined for their eligibility to the National Register of Historic Places (NRHP) and would require more research or test excavations to determine their status. The remaining four sites (LA 34765, LA 34767, LA 169208, and LA 169752) are recommended as eligible to the NRHP under criterion D.</p> <p>Invitations to participate in Section 106 and Government-to-Government consultation were sent to potential consulting parties on December 21, 2021, as detailed below in <i>Section 4.1</i>. As a result of feedback during the Section 106 consultation process, there was an ethnographic inventory conducted with local Navajo residents by BLM archaeologist Erik Simpson as described below.</p> <p>It is recommended that all ground disturbing activity avoid the NRHP-eligible and undetermined sites by a minimum of 50 feet (15 meters) with the use of temporary fencing and archaeological monitoring (as necessary). Menefee has committed to this as a project design feature, thus the undertaking should have no effect on historic properties or potential historic properties.</p>
How would proposed ground-disturbing mining activities impact Native American religious concerns or other concerns?	<p>In response to the Section 106 consultation letter, a consultation request was received by the BLM from the Navajo Nation Heritage and Historic Preservation Department (NNHHPD). Through conversations with Tim Begay of the NNHHPD, a known, named traditional cultural property (TCP) was identified as potentially being in the vicinity of the APE. In response, Erik Simpson, BLM FFO archaeologist, went to the local Navajo communities and conducted ethnographic interviews with elders to determine if they knew of this TCP. Based on the results of the interviews it appears that the TCP’s location in the NNHHPD records is in error and the TCP is not located near the proposed project (personal communication Erik Simpson 2024). After reviewing the report and conducting additional field work, BLM FFO archaeologist Erik Simpson determined that the Proposed Action would not impact sensitive cultural resources or Native American religious concerns.</p>
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 (PFYC) 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.</p> <p>The area was surveyed by a professional paleontologist in May 2021 under BLM Paleontological Resources Use Permit NM16-02C (Zeigler 2021). No fossil material was observed during the paleontological survey. Appendix E contains the findings letter from the survey.</p> <p>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</p>

Issue Statement	Rationale for Not Further Discussing in Detail in the EA
	impacts to any buried paleontological resources. The proposed project would be in compliance with the Paleontological Resources Preservation Act of 2009.
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 disturb 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 117 acres of potential wildlife habitat would be removed during proposed ground-clearing activities which will take place over approximately 12 years, with 117 acres included in the entire mine site over the life of the mine, which will depend on product demand and reserve quality. 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.
How would vegetation removal and increased noise during proposed mining activities impact federally listed threatened, endangered, and candidate species?	A biological contractor performed a survey of biological resources in the proposed project area in April 2021 (Bowers 2021) and prepared a biological evaluation that was reviewed by the BLM FFO. 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 FFO RMP (BLM 2003) and the 2002 Biological Assessment associated with the RMP (BLM 2002).
How would vegetation removal and increased noise during proposed mining activities impact non-federal special-status species?	A biological contractor performed a survey of biological resources in the proposed project area in April 2021 (Bowers 2021) and prepared a biological evaluation that was reviewed by the BLM FFO. The proposed project area is not within any known special status species habitat, and no habitat or individuals were identified during the 2021 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 FFO RMP (BLM 2003). 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.

Issue Statement	Rationale for Not Further Discussing in Detail in the EA
<p>What is the potential for the spread of noxious weeds and invasive plants as a result of the proposed project?</p>	<p>The proposed mine expansion would disturb up to 117-acres included in the permit area. Mining would occur in blocks with a maximum size of 12 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) 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.</p>
<p>How would proposed mining activities impact range improvements and livestock mobility associated with the existing allotment within the proposed project area?</p>	<p>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 12 acres at one time under the mine plan, which is less than 0.009% of the allotment's acreage. The overall mine expansion project area is 117 acres, which accounts for 0.12% 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.</p>
<p>What vegetation impacts would occur as a result of proposed ground-disturbing activities?</p>	<p>The BLM FFO manages approximately 435,500 acres within the Great Basin Desert scrub plant community (BLM 2003). The proposed project, which would result in the clearing of up to 117 acres of sagebrush shrubland (which is part of the Great Basin Desert scrub plant community), would impact less than 0.04% of this community within the BLM FFO. The mine proposal, which includes disturbances of less than 12-acres at a time and concurrent reclamation of mined-out areas would ensure vegetation re-growth occurs as quickly as possible. With concurrent reclamation proposed in the mine plan (Appendix D), impacts to vegetation are not expected to exceed 12 acres at one time. No further analysis is necessary.</p>

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 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 117 acres over 10-15 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 saleable 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, impacts to these economic sectors are anticipated to be minimal. 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. Given the potential for minimal impacts, no further analysis is necessary.</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 an 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 below). There were no other EJ populations of concern identified in the analysis area.

**Table 1.2b. Demographic data for McKinley County, New Mexico**

Population Totals (2022)*	McKinley County, NM	State of New Mexico
Total Population	72,073	2,112,463
Hispanic or Latino (% of total)	10,559 (14.6%)	1,051,626 (49.8%)
White alone (% of total)	5,762 (7.8%)	752,424 (35.6%)
Black or African American alone (% of total)	355 (0.5%)	37,996 (1.8%)
American Indian alone (% of total)	52,895 (73.4%)	178,608 (8.5%)
Asian alone (% of total)	877 (1.2%)	32,214 (1.5%)
Native Hawaiian and other Pacific Islander alone (% of total)	56 (0.1%)	1,117 (0.1%)
People with income below poverty level	31.9%	17.6%

Source: U.S. Census Bureau American Community Survey (U.S. Census Bureau as of May 21, 2024) 5-year estimates used.

\*2022 represents average characteristics from 2017-2022.

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.

Under the Proposed Action, the BLM would allow the applicant to expand the existing 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. Mining development may also contribute to employment for local resident EJ populations, however, as continued demand for humate-related goods and services create new opportunities that did not exist before.

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<sub>2.5</sub> or PM<sub>10</sub>) 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.

Issue Statement	Rationale for Not Further Discussing in Detail in the EA
	<p>Groundwater resources are regional in nature thus affect EJ and non-EJ populations equally. 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. The water demand from the proposed mine project would increase surface and groundwater demand in the New Mexico portion of the San Juan Basin by 0.000011% when compared to 2015 total water use.</p> <p>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, potentially impacted, EJ populations. The BLM will continue to work with affected EJ populations to identify and address additional EJ issues as they arise. In summary, the Proposed Action is not anticipated to negatively impact the EJ population and any impacts would be localized and temporary.</p>
<p>How would the proposed mine project and associated surface disturbance impact the quality and quantity of surface water and groundwater sources?</p>	<p>Based on the biological and environmental resource surveys conducted, there are no perennial waterways, ephemeral drainages with defined beds or banks, FEMA mapped 100-year floodplains, Waters of the US, or Wetlands within the proposed project area.</p> <p>The proposed mine is in the Middle Rio Grande Underground Water Basin, east of the Continental Divide (NMOSE 2024). The closest New Mexico Office of State Engineer (NMOSE) documented groundwater well is located north of the project area approximately 1,845 feet (NMOSE 2024). The documented well was drilled in 1963 and has served as a water well for stock in the area (NMOSE 2024). The documented depth of the well is 137 feet with water occurring at 48 feet (NMOSE 2024). NRCS soil data indicates that ground water would occur at depths greater than 80 feet (NRCS, 2016a).</p> <p>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.</p> <p>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.</p> <p>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. Therefore, the impact to the quality and quantity of surface water and groundwater resources is anticipated to be <i>de minimis</i>.</p>

Issue Statement	Rationale for Not Further Discussing in Detail in the EA
<p>How would the proposed project impact public access to BLM lands (for uses such as hunting, fishing, shooting, etc.)?</p>	<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. Detailed analysis is therefore not warranted.</p>
<p>How would the construction and operation phases of the proposed project impact public health and safety?</p>	<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 (PM<sub>10</sub>). 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"> <li>1. Federal, state, county and municipal fire managers coordinate on fire response and mitigation.</li> <li>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.</li> <li>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 is regulated according to safety laws as stipulated by the Department of Transportation.</li> <li>4. All mineral material mining operations are subject to BLM terms and conditions, as described under 43 CFR 3600.</li> </ol> <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 the mine 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 (Star Lake Road), then to Cuba, NM on NM-197. The proposed mine would not result in a net increase in truck traffic over current Menefee operations, as existing mine site reserves are</p>



Issue Statement	Rationale for Not Further Discussing in Detail in the EA
	limited, and production is planned to be replaced by the Proposed Action. As a result, no further analysis is necessary.

## 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 Menefee. Menefee would conduct surface mining of humate deposits by mining individual areas less than 12 acres at one time, with continual reclamation occurring simultaneously, within the 117-acre permit located in McKinley County, New Mexico. Humate resources were found to be economically viable for extraction during preliminary evaluations of the Black Spring Humate Mine Expansion’s proposed location; therefore, a Mining and Reclamation Plan has been prepared 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.

Menefee would establish, operate, and eventually abandon the surface mining operation following the Minimum Impact Mining methods as proposed in their 2024 Mining and Reclamation Plan (Appendix D). The proposed mine plan follows a sequence of approximately 12-acre disturbances throughout the mine area, with continual and complete reclamation occurring between new mining disturbances. Annual production is expected to be approximately 5,000-15,000 tons per year, with total production depending on reserve quantity and quality, as well as demand for humate.

The proposed project area is located in Township 19N, Range 5W, Sections 4 and 9, adjacent to Indian Service Route 47, 22 miles west of US 550 and approximately 24 miles southwest of Cuba, New Mexico (Appendix A). The community of Ojo Encino is approximately 4 miles north of the project area.

#### 2.1.1 *Mining Operations*

Detailed information on the mining operations can be found in Menefee’s 2024 Mining and Reclamation Plan (Appendix D).

Access to the proposed project area would be from Indian Service Route 47 and the existing mine access road. Equipment to be used during mining operations would include a front-end loader, dozer, and excavator. Workers at the site utilize a company gas-powered truck to commute to the mine site and utilize this truck for water transportation, as needed.

The humate thickness and quality vary within the formation, therefore; Menefee estimates that the humate thickness across the area averages approximately 6 feet and is relatively continuous. Humate occurs either at the surface or in the shallow subsurface. Overburden would be removed in 1/2-acre increments within each mining area, with no greater than 2 to 4 acres of excavated overburden stockpiled at any given time. Overburden would be salvaged separately and placed in designated stockpile areas next to the pit for use in backfilling, regrading and reclamation.

Humate would be mined from open pits in the proposed mining areas in phases, as described in the Mining and Reclamation Plan. The pit size is usually restricted to about 1 to 3 acres at any one time. Once

enough humate is extracted and stockpiled, it will be loaded into 20-ton trucks for transport to the processing plant in Cuba, NM for processing and packaging for distribution to various buyers.

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.

### *2.1.2 Mining and Reclamation of Successive 12-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 as authorized, and 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 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 not complete a sale of federal minerals to Menefee and deny Menefee 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 117-acre permit area from being considered for future projects by the BLM FFO.

## *2.3 Alternatives considered but eliminated from detailed analysis*

Menefee conducted exploratory operations in 2023 in Sections 4 and 9, Township 19N, Range 5W to determine the most economic and feasible location to optimize extraction of humate in the area. Details of this undertaking are further described in NEPA DOI-BLM-NM-F010-2022-0063-CX, Black Springs Humate Section 4 & 9 Exploration Project.

This exploration allowed Menefee to understand the best vein of the humate resource and where to focus their efforts for their program. They eliminated the areas to the north and west of their current operation, allowing them to focus east on the location of the Proposed Action.

# **3 Affected Environment, Environmental Consequences, and Cumulative Impacts**

## *3.1 Affected Environment*

Table 1.2 in Section 1.7 provides a summary of the Affected Environment.

## 3.2 *Environmental Impacts – Proposed Action*

Table 1.2 presents the potential issues identified for analysis in brief by the BLM FFO ID Team, and Table 1.3 includes the rationale for eliminating issues from detailed analysis in the EA. In May and June 2023, when the BLM FFO IDT met to consider what issues could be subject to detailed analysis, they identified one issue for detailed analysis in the EA: “How would emissions generated by equipment associated with the proposed project impact air quality?” However, after completing the initial impacts analysis with the BLM Emissions and Modeling Impacts Tool (EMIT—the BLM’s toolkit to aid individuals needing to prepare air resources related NEPA analyses) described in Table 1.2a, the resulting potential impacts from the Proposed Action on air quality were found to be *de minimis* and emissions levels for San Juan County for criteria pollutants, HAPs, and VOCs would be expected to remain in attainment.

Therefore, after further engagement occurred on October 3, 2024, with Adam Deppe, the New Mexico Air Quality Specialist with the BLM New Mexico State Office, and Jeff Tafoya, BLM FFO Assistant Manager and IDT member for this project, this issue was considered no longer significant enough for detailed analysis in this EA due to the minimal environmental impacts on air quality.

## 3.3 *Environmental Impacts – No Action Alternative*

Under the No Action Alternative, the proposed mine project would not be approved, and the BLM would not sell federal salable mineral materials (humate) to Menefee, which means that the proposed surface mine would not be constructed and no humate would be removed from the expanded mine area. Therefore, the only contribution to emissions levels for criteria pollutants, HAPs, and VOCs would be the remaining mining of humate in the current permitted mine area at permitted levels.

When comparing the Proposed Action and No Action Alternatives and issues identified in Section 1.7, environmental impacts from either alternative are anticipated to be *de minimis*.

## 3.4 *Cumulative Impacts*

### 3.4.1 *Cumulative Impact Area (CIA)*

The Cumulative Impact Area (CIA) for this analysis is the New Mexico portion of the San Juan Basin.

The Proposed Action is not anticipated to increase cumulative impacts to the CIA, due to the minimal nature of impacts anticipated by development of the humate mine, as discussed in Table 1.2.

### 3.4.2 *Past and Present Actions*

The Proposed Action mine expansion area is located in Township 19N, Range 5W, Sections 4 and 9 (see **Figure A.1**, **Figure A.2**, and **Figure A.3** in Appendix A). Other humate mines exist and are currently operating in the San Juan Basin, by companies other than Menefee, in Sandoval County, 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).

### 3.4.3 *Reasonably Foreseeable Future Actions*

Humate mining is anticipated to continue in the foreseeable future. There is currently one other humate mine application being reviewed by the BLM FFO (*Personal communication* Aleksandr Knapowski,

Geologist, BLM FFO October 2, 2024). No other proposed humate operation applications have been received by the BLM FFO at the time of writing. Other salable mineral material operations in the area (such as sand and gravel or sandstone) are expected to continue at their historic rate.

Additionally, other future actions anticipated include continued oil and gas development, power plant-based operations, and solar developments.

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.

APS came to an agreement with the other Four Corners power plant owners to begin operating the plant seasonally in 2023 to create a compromise of continued service reliability for customers in Arizona's hot summer months with a 20-25% reduction in annual carbon emissions, which continue until the anticipated shutdown of the plant in 2031 (APS 2021).

D.E. Shaw Renewable Investments is in the process of developing their San Juan Solar and Storage Project that will interconnect to the grid using existing transmission infrastructure of the former San Juan Generating Station. The first phase is known as San Juan 1 and is the initial component of a larger project that should generate 400MW of renewable energy once constructed without compromising air quality (IWG 2024)

### *3.4.4 Cumulative Impact Analysis*

The Proposed Action is not anticipated to create impacts that would significantly increase cumulative impacts in the CIA.

### *3.4.5 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 12-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.

## **4 Consultation and Coordination**

### *4.1 Summary of Consultation and Coordination*

#### *4.1.1 Endangered Species Act 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 FFO RMP (BLM 2003) (see **Table 1.3** [Issues Identified but Eliminated from Detailed Analysis] and NEPA IDT checklist [Appendix G]).

An informal, online ESA query was conducted by AECS using the Information for Planning and Consultation (IPaC) website, to ensure no additional USFWS listed species or critical habitat have the potential to occur with the proposed project area (IPaC 2024).

The query provided the species and critical habitat with the potential to occur within the proposed project area and are listed below. None of the species listed were found in the proposed project area and are not anticipated to occur based on site surveys and documented habitat conditions.

**Birds**

- Mexican Spotted Owl (*Strix occidentalis lucida*), Threatened
- Yellow-billed Cuckoo (*Coccyzus americanus*), Threatened

**Insects**

- Monarch Butterfly (*Danaus plexippus*), Candidate

**Flowering Plants**

- Zuni Fleabane (*Erigeron rhizomatus*), Threatened

**Critical habitats**

- There are no critical habitats at this location.

### 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 21, 2021, with a request for response within 30 days of receipt.

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

<b>Tribe or Tribal Representative</b>	<b>Representative</b>
Jicarilla Apache Tribal Council	President Darrell Paiz
Kewa Pueblo (Pueblo of Santo Domingo)	Governor Thomas Moquino, Jr
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 Officer	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 Officer	Lt. Governor Arnold J. Garcia

<b>Tribe or Tribal Representative</b>	<b>Representative</b>
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 Officer	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
The Hope Tribe	Chairman Timothy L. Nuvangyaoma
Ute Mountain Ute Tribe	Chairman Manuel Hart

In response to the Section 106 consultation letter, a consultation request was received by the BLM from the NNHHPD. Through conversations with Tim Begay of the NNHHPD, a known, named TCP was identified as potentially being in the vicinity of the APE. In response, Erik Simpson, BLM FFO archaeologist, went to the local Navajo communities and conducted ethnographic interviews with elders to determine if they knew of this TCP. Based on the results of the interviews it appears that the TCP's location in the NNHHPD records is in error and the TCP is not located near the proposed project (personal communication Erik Simpson 2024). After reviewing the survey report and based on the additional ethnographic fieldwork, BLM FFO archaeologists determined there would be no impact on sensitive cultural resources. The Hopi Tribe requested copies of the Class III archaeological survey were received on October 28, 2019. The survey copies were provided, and no further information was requested. No other responses were received as of the decision date.

#### *4.1.3 New Mexico State Historic Preservation Officer (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 (De Cunzo 2021) was conducted for the proposed project. Five previously recorded archaeological sites (LA 34765, LA 34767, LA 169207, LA 169208, and LA 169751); one newly recorded archaeological site (LA199130); and seven isolated manifestations (IMs) were documented and evaluated within the APE. Of the sites, LA 169207 and LA 199130 are recommended as undetermined for their eligibility to the National Register of Historic Places (NRHP) and would require more research or test excavations to determine their status. The remaining four sites (LA 34765, LA 34767, LA 169208, and LA 169752) are recommended as eligible to the NRHP under criterion D.

It is recommended that all ground disturbing activity avoid the NRHP-eligible and undetermined sites by a minimum of 50 feet (15 meters) with the use of temporary fencing and archaeological monitoring (as necessary). Assuming these management recommendations are followed, the undertaking should have no effect on historic properties or potential historic properties.

## **5 Appendices**

Appendix A – Figures

Appendix B – List of Preparers

Appendix C – Acronyms and Abbreviations

Appendix D – List of References

Appendix E – Mining and Reclamation Plan

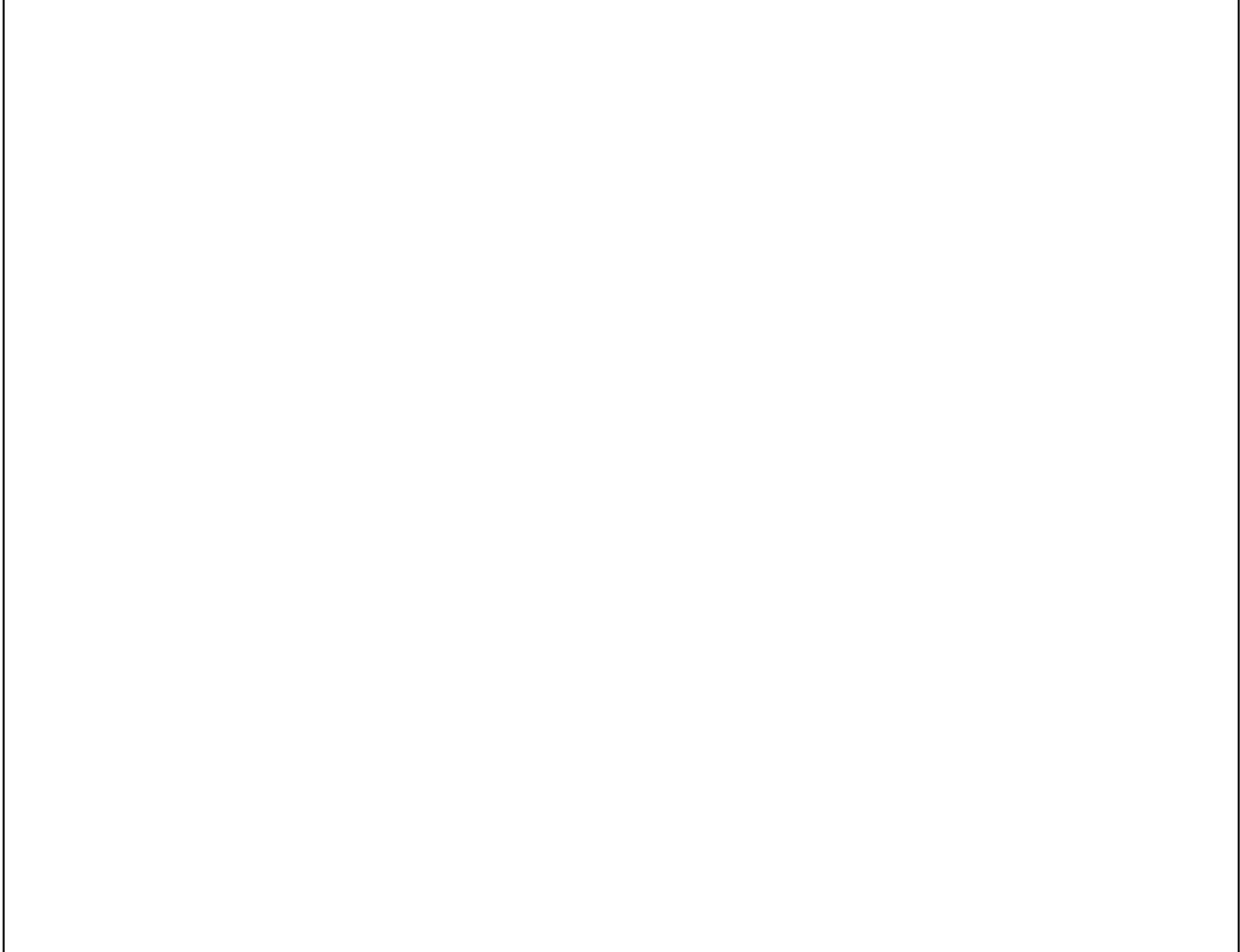
Appendix F – Paleontological Survey Report

Appendix G – NEPA ID Team Checklist

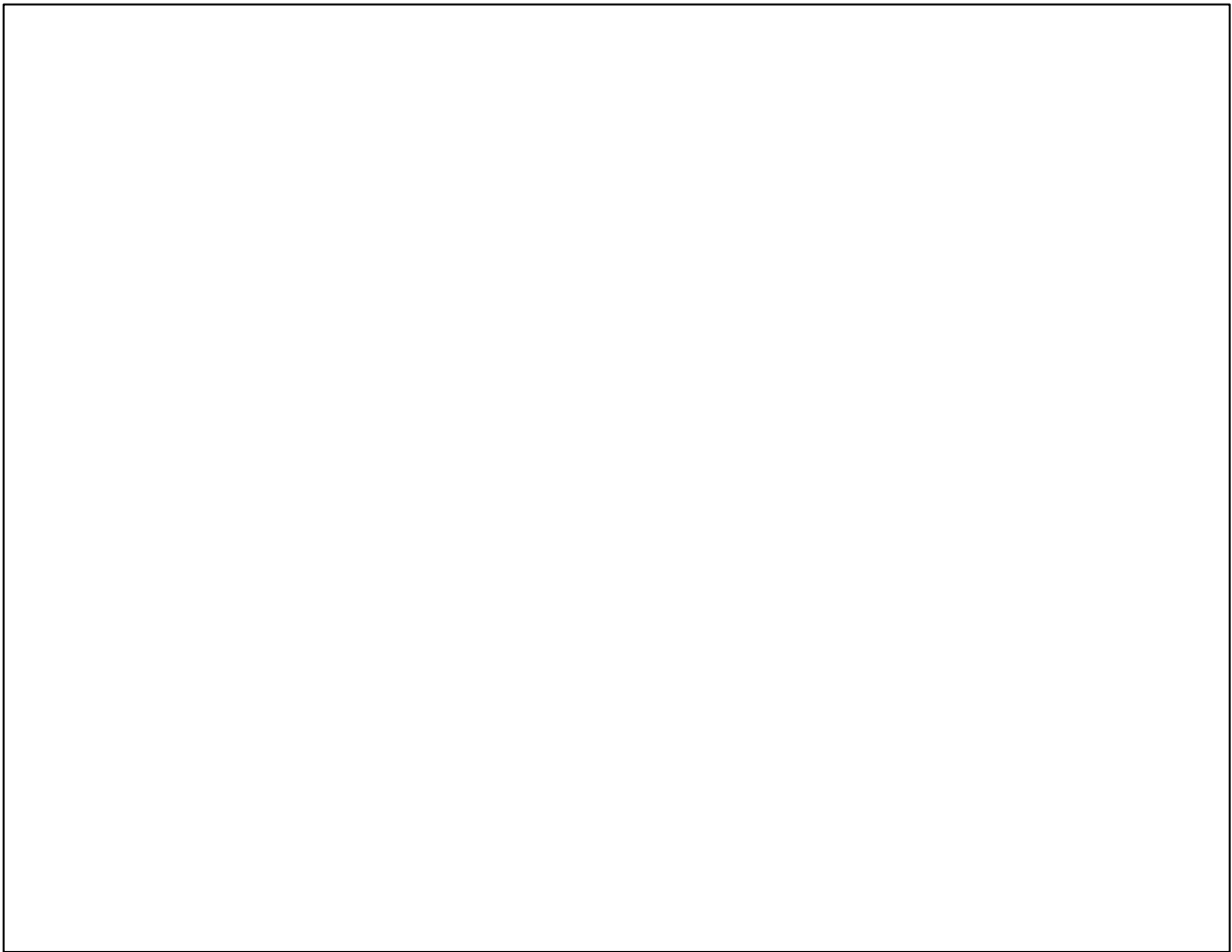


# Appendix A - Figures

Figure A.1 Project Vicinity Map



**Figure A.2 Project Area Map**



### Figure A.3 Project Plat

## Appendix B – List of Preparers

This EA has been prepared jointly by Ancell Environmental Consulting Services, LLC and the BLM FFO with support from P3planning 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	Supervisory Natural Resource Specialist	BLM FFO
Whitney Thomas	Planning and Environmental Coordinator	BLM FFO
Erik Simpson	Archaeologist	BLM FFO
Mark Williams	Archaeologist	BLM FFO
Stanley Allison	Outdoor Recreation Planner	BLM FFO
Doug McKim	Outdoor Recreation Planner	BLM FFO
Cassandra Gould	Rangeland Management Specialist	BLM FFO
Nolan Craun	Supervisory Realty Specialist	BLM FFO
Tim Begay	Tribal Liaison	BLM FDO
John Kendall	Threatened and Endangered Species Biologist	BLM FFO
Jeff Tafoya	Assistant Field Office Manager	BLM FFO
Adam Deppe	New Mexico Air Quality Specialist	BLM State Office
Theresa Ancell	Environmental Planner	Ancell Environmental Consulting Services
William Penner	Environmental Planner	P3planning
Dr. Kate Zeigler	Paleontologist	Zeigler Geologic Consulting

## Appendix C – Acronyms and Abbreviations

<b>Acronym</b>	<b>Definition</b>
2018 RFD	The Reasonably Foreseeable Development Scenario for Oil and Gas Activities: Mancos-Gallup Resource Management Plan Amendment Planning Area, Farmington Field Office, northwestern New Mexico
AQI	Air Quality Index
ARPA	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 <sub>2</sub> S	hydrogen sulfide
HAP	hazardous air pollutant
IDT	Interdisciplinary Team
IWG	Interagency Working Group on Coal & Power Plant Communities & Economic Revitalization
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

<b>Acronym</b>	<b>Definition</b>
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 <sub>2</sub>	nitrogen dioxide
NO <sub>x</sub>	nitrogen oxide(s)
O <sub>3</sub>	ozone
Pb	lead
PL	Public Law
PM <sub>2.5</sub>	particulate matter equal to or less than 2.5 microns in diameter
PM <sub>10</sub>	particulate matter equal to or less than 10 microns in diameter
RMP	Resource Management Plan
RMPA	Resource Management Plan Amendment
ROD	Record of Decision
SDA	Specially Designated Area
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO <sub>2</sub>	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

## **Appendix D – List of References**

- AirNow. 2016. Air Quality Index (AQI) Basics. Available at: <https://www.airnow.gov/index.cfm?action=aqibasics.aqi>. Accessed September 2024.
- Arizona Public Service (APS). 2021. APS announces plans for seasonal operations at Four Corners Power Plant. Available at: <https://www.aps.com/en/About/Our-Company/Newsroom/Articles/aps-announces-plans-for-seasonal-operations-at-four-corners-power-plant>. Accessed September 2024.
- Bowers, Clay. 2021. *Biological Evaluation, Proposed Expansion of the Black Spring Humate Mine*. Rocky Mountain Ecology, Rio Rancho.
- Bureau of Land Management (BLM). 1986. Rio Puerco Proposed Resource Management Plan and Final Environmental Impact Statement. Albuquerque, New Mexico.
- . 2002. Final Biological Assessment: Impacts to Threatened and Endangered Species Related to the Resource Management Plan Revision. Farmington Field Office. Farmington, New Mexico. September.
- . 2003. *Farmington Resource Management Plan with Record of Decision*. Farmington, New Mexico: Bureau of Land Management Farmington Field Office. Available at: [https://eplanning.blm.gov/public\\_projects/lup/64524/96667/116772/FDO\\_-\\_FFO\\_-\\_2003\\_-\\_Farmington\\_RMP\\_and\\_ROD.pdf](https://eplanning.blm.gov/public_projects/lup/64524/96667/116772/FDO_-_FFO_-_2003_-_Farmington_RMP_and_ROD.pdf). Accessed September 2024.
- . 2008. *BLM National Environmental Policy Act Handbook H-1790-1*. Washington, D.C.: Bureau of Land Management NEPA Program Office of the Assistant Director, Renewable Resources and Planning.
- . 2012. Rio Puerco Resource Management Draft Plan and Environmental Impact Statement. August 2012. Available at: <https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=92304>. Accessed December 2023.
- . 2015. *Bighorn Basin Resource Management Plan Revision Project Proposed Resource Management Plan and Final Environmental Impact Statement*. Cody and Worland, WY: U.S. Department of the Interior, Bureau of Land Management. Accessed September 2024.
- . 2018a. *Air Resources Technical Report for Oil and Gas Development: New Mexico, Oklahoma, Texas and Kansas*. Available at: <https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/about/new-mexico>. Accessed September 2024.
- . 2018b. Brack's Fishhook Cactus (*Sclerocactus cloverae* var. *Brackii*) and Aztec Gilia (*Aliciella formosa*) Habitat Instruction Memorandum (Shapefile of Aztec gilia and Brack's fishhook cactus potential habitat zone). Provided by the Bureau of Land Management Farmington Field Office. October 2018.
- . 2019a. BLM Farmington Field Office May 2020 Lease Sale. Available at: [https://eplanning.blm.gov/epl-front-office/projects/nepa/1500868/20005527/250006435/EA\\_FF0\\_May2020\\_for\\_PubComment\\_508.pdf](https://eplanning.blm.gov/epl-front-office/projects/nepa/1500868/20005527/250006435/EA_FF0_May2020_for_PubComment_508.pdf). Accessed September 2024.



- . 2019b. *2019 BLM New Mexico Water Support Document*. BLM New Mexico State Office, Santa Fe, New Mexico. Available at: <https://www.blm.gov/node/5366>. Accessed September 2024.
- . 2019c. ePlanning. Available at <https://eplanning.blm.gov/epl-front-office/eplanning/projectSummary.do?methodName=renderDefaultProjectSummary&projectId=89078>. Accessed September 2024.
- . 2023a. 2022 BLM Air Resources Technical Report for Oil and Gas Development in New Mexico, Oklahoma, Texas, and Kansas. Available at: <https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/about/new-mexico>. Accessed August 2024.
- . 2024. ePlanning. Available at: <https://eplanning.blm.gov/eplanning-ui/project/2033534/510>. Accessed July 2024.
- Bureau of Land Management (BLM) and Bureau of Indian Affairs (BIA). 2020. Farmington Mancos Gallup Draft Resource Management Plan Amendment and Environmental Impact Statement. February 2020. Available at: [https://eplanning.blm.gov/public\\_projects/lup/68107/20013477/250018467/FMG\\_DraftRMPA-EIS\\_Vol-1\\_508.pdf](https://eplanning.blm.gov/public_projects/lup/68107/20013477/250018467/FMG_DraftRMPA-EIS_Vol-1_508.pdf). Accessed April 2022.
- Bureau of Land Management (BLM) and New Mexico State Historic Preservation Office (SHPO). 2014. State Protocol Agreement between New Mexico BLM and New Mexico State Historic Preservation Officer. Available at: [https://www.blm.gov/sites/default/files/NM%20BLM-SHPO%20Protocol%20Agmt\\_Signed\\_12-17-2014%20%281%29.pdf](https://www.blm.gov/sites/default/files/NM%20BLM-SHPO%20Protocol%20Agmt_Signed_12-17-2014%20%281%29.pdf). Accessed September 2024.
- Bureau of Land Management (BLM) and Ramboll. 2017. Colorado Air Resource Management Modeling Study (CARMMS 2.0). Available at: [https://www.blm.gov/sites/default/files/documents/files/program\\_natural%20resources\\_soil%20air%20water\\_airo\\_quicklins\\_CARMMS2.0\\_with%20Appendices.pdf](https://www.blm.gov/sites/default/files/documents/files/program_natural%20resources_soil%20air%20water_airo_quicklins_CARMMS2.0_with%20Appendices.pdf). Accessed DATE.
- . 2018. Air Impact Assessment for BLM Farmington Field Office Oil and Gas Development. Available upon request at the Farmington Field Office.
- . 2023a. BLM Cumulative Hazardous Air Pollutants Modeling – Final - Report Cumulative HAPS. Available at: <https://eplanning.blm.gov/eplanning-ui/project/1505069/570>. Accessed July 2024.
- . 2023b. BLM Western US Photochemical Air Quality Modeling For 2032. Available upon request.
- . 2024. BLM FFO Cumulative Hazardous Air Pollutants Modeling – Executive Summary. Available at: <https://www.blm.gov/sites/default/files/docs/2024-07/cumulative-haps-summary-paper-FFO-nm-2024v2.pdf>. Accessed July 2024.
- BLM and USFS. 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (The Gold Book). Available at <https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/operations-and-production/the-gold-book>. Accessed August 2024.
- Colorado Department of Public Health and Environment (CDPHE). 2005. SCREEN3 Stationary Source Modeling Guidance. Available at: <https://www.colorado.gov/airquality/permits/screen.pdf>. Accessed July 2024.

- Council on Environmental Quality (CEQ). (2023). Guidance: National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change. Available at: <https://www.regulations.gov/document/CEQ-2022-0005-0001>. Accessed August 2024.
- Crocker, K., and J.F. Glover. 2018. *Reasonably Foreseeable Development Scenario for Oil and Gas Activities: Mancos-Gallup RMPA Planning Area, Farmington Field Office, Northwestern New Mexico. United States Department of the Interior Bureau of Land Management Final Report* February 2018. Available at: [https://eplanning.blm.gov/epl-front-office/projects/nepa/110578/161453/197157/2018.02.27\\_Crocker\\_Glover\\_FFO\\_RFD.pdf](https://eplanning.blm.gov/epl-front-office/projects/nepa/110578/161453/197157/2018.02.27_Crocker_Glover_FFO_RFD.pdf). Accessed September 2024.
- \_\_\_\_\_. 2019. Reasonably Foreseeable Development Scenario for Oil and Gas Activities: Rio Puerco Field Office, New Mexico. United States Department of the Interior Bureau of Land Management Final Report December 2019.
- De Cunzo, Antonio. 2021. *A Class III Archaeological Inventory of 160 Acres for the Menefee Humate Mine Expansion, McKinley County, New Mexico*. NMCRI 148083. Paleowest Report No, 21-397, Albuquerque.
- Dieter, C.A., M.A. Maupin, R.R. Caldwell, M.A. Harris, T.I. Ivahnenko, J.K. Lovelace, N.L. Barber, and K.S. Linsey. 2018. Estimated use of water in the United States in 2015: U.S. Geological Survey Circular 1441, 65 p. Report and dataset available at: <https://pubs.er.usgs.gov/publication/cir1441>. Accessed September 2024.
- Dix, Bryce. 2024. *San Juan Generating Station cleanup set to begin in 2025*. KUNM News, August 19, 2024. Available at: <https://sourcennm.com/2024/08/19/san-juan-generating-station-cleanup-set-to-begin-in-2025/>. Accessed September 2024.
- Emissions Database for Global Atmospheric Research (EDGAR). 2023. GHG Emissions of all World Countries. Available at: [https://edgar.jrc.ec.europa.eu/report\\_2023](https://edgar.jrc.ec.europa.eu/report_2023). Accessed August 2024.
- Enchant Energy. 2019a. San Juan Generating Station. Available at: <https://www.enchantenergy.com/san-juan-generating-station/>. Accessed September 2024.
- Enchant Energy. 2019b. San Juan Generating Station. Update on Carbon Capture Retrofit Project. Available at: <https://www.enchantenergy.com/wp-content/uploads/2019/10/Enchant-Energy-Public-Presentation-Economic-Rural-Dev-Comm-Oct-29-2019-Final-PDF.pdf>. Accessed September 2024.
- U.S. Environmental Protection Agency (EPA). 2023. Air Quality Design Values. Available at: <https://www.epa.gov/air-trends/air-quality-design-values>. Updated August 2, 2022. Accessed November 2024.
- ICF and Colorado State University. 2019. Final Report: Human Health Risk Assessment for Oil and Gas Operations in Colorado. October 17, 2019. Available at: [https://drive.google.com/file/d/1pO41DJMXw9sD1NjR\\_OKyBJP5NCb-AO0I/view](https://drive.google.com/file/d/1pO41DJMXw9sD1NjR_OKyBJP5NCb-AO0I/view). Accessed August 2024.
- Interagency Working Group (IWG) on Social Cost of Greenhouse Gases, United States Government. 2021. Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide, Interim Estimates under Executive Order 13990. pp. 14. Available at [https://eplanning.blm.gov/public\\_projects/2015538/200495187/20062546/250068728/Exhibit%2044%20-](https://eplanning.blm.gov/public_projects/2015538/200495187/20062546/250068728/Exhibit%2044%20-)

- %20TechnicalSupportDocument\_SocialCostofCarbonMethaneNitrousOxide.pdf. Accessed August 2024.
- Intergovernmental Panel on Climate Change (IPCC). 2020. IPCC Special Report on Global Warming of 1.5°C. Available at: <https://www.ipcc.ch/sr15/>. Accessed August 2024.
- . 2021. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Changes. Available at: <https://www.ipcc.ch/report/ar6/wg1/>. Accessed August 2024.
- Interagency Working Group on Coal & Power Plant Communities & Economic Revitalization (IWG). 2024. *San Juan Solar and Storage*. U.S. Department of Energy, Washington D.C. Available at: <https://energycommunities.gov/san-juan-solar-and-storage/>. Accessed September 2024.
- Matichuk, R., G. Tonnesen, A. Eisele, E. Thoma, M. Kosusko, M. Strum, and C. Beeler. 2016. *Advancing Understanding of Emissions from Oil and Natural Gas Production Operations to Support EPA's Air Quality Modeling of Ozone Non-Attainment Areas; Final Summary Report*. EPA/600/R-17/224. Washington, D.C.: U.S. Environmental Protection Agency. Available at: [https://cfpub.epa.gov/si/si\\_public\\_record\\_Report.cfm?Lab=NRMRL&dirEntryId=335190](https://cfpub.epa.gov/si/si_public_record_Report.cfm?Lab=NRMRL&dirEntryId=335190). Accessed September 2024.
- New Mexico Office of the State Engineer (NMOSE). 2005. *Underground Water Basins in New Mexico*. New Mexico Office of the State Engineer. Santa Fe, New Mexico.
- NRCS. 2016a. *Web Soil Survey*. Washington, D.C.: NRCS. Available at: <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>. Accessed September 2024.
- U.S. Environmental Protection Agency (EPA). 1995. SCREEN3 Model User's Guide. Available at: <https://gaftp.epa.gov/Air/aqmg/SCRAM/models/screening/screen3/screen3d.pdf>. Accessed July 2024.
- . 2000. Science Policy Council Handbook “Risk Characterization”, EPA 100-B-00-002, December 2000. Available at: [https://www.epa.gov/sites/default/files/2015-10/documents/osp\\_risk\\_characterization\\_handbook\\_2000.pdf](https://www.epa.gov/sites/default/files/2015-10/documents/osp_risk_characterization_handbook_2000.pdf). Accessed July 2024.
- . 2003. Framework for Cumulative Risk Assessment. EPA/630/P-02/001F. EPA ORD/NCEA, Washington, DC. Available at: [https://www.epa.gov/sites/default/files/2014-11/documents/frmwrk\\_cum\\_risk\\_assmnt.pdf](https://www.epa.gov/sites/default/files/2014-11/documents/frmwrk_cum_risk_assmnt.pdf). Accessed March 2024.
- . 2008. National Emissions Inventory. Available at: <https://www.epa.gov/air-emissions-inventories/2008-national-emissions-inventory-nei-data>. Last updated June 22, 2023. Accessed July 2024.
- . 2012. 40 CFR Part 58, Appendix D Network Design Criteria for Ambient Air Quality Monitoring. Available at: <https://www.govinfo.gov/content/pkg/CFR-2012-title40-vol6/pdf/CFR-2012-title40-vol6-part58-appD.pdf>. Accessed September 2024.
- . 2014. The 2014 National Emissions Inventory. Available at: <https://www.epa.gov/air-emissions-inventories>. Accessed September 2024.
- . 2018. Inventory of U.S. Greenhouse Gas Emissions and Sinks. 1990-2016. Washington, D.C.: U.S. EPA.
- . 2019a. Criteria air pollutants NAAQS table. Available at: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>. Accessed September 2024.

- . 2019b. Air Quality Design Values. Retrieved from U.S. Environmental Protection Agency: <https://www.epa.gov/air-trends/air-quality-design-values#report>. Accessed September 2024.
- . 2019c. Air Quality Index Basics. Available at: <https://www.airnow.gov/index.cfm?action=aqibasics.aqi>. Accessed September 2024.
- . 2019d. Outdoor Air Quality Data: Air Quality Index Report. Available at: <https://www.epa.gov/outdoor-air-quality-data/air-quality-index-report>. Accessed September 2024.
- . 2019e. 2014 National-Scale Air Toxics Assessment Results. Available at: <https://www.epa.gov/national-air-toxics-assessment/2014-nata-assessment-results>. Accessed September 2024. United Nations Environment Programme (UNEP). 1987. The Montreal Protocol on Substances that Deplete the Ozone Layer. Available at: <https://ozone.unep.org/treaties/montreal-protocol/montreal-protocol-substances-deplete-ozone-layer>. Accessed August 2024.
- . 2019. Technical Support Document for EPA's Updated 2028 Regional Haze Modeling. Available at: [https://www.epa.gov/sites/default/files/2019-10/documents/updated\\_2028\\_regional\\_haze\\_modeling-tsd-2019\\_0.pdf](https://www.epa.gov/sites/default/files/2019-10/documents/updated_2028_regional_haze_modeling-tsd-2019_0.pdf). Accessed July 2024.
- . 2021. Dose-Response Assessment for Assessing Health Risks Associated with Exposure to Hazardous Air Pollutants. Available at: <https://www.epa.gov/fera/dose-response-assessment-assessing-health-risks-associated-exposure-hazardous-air-pollutants>. Accessed August 2024.
- . 2022a. 2019 Air Toxics Screening Assessment. Available at: <https://www.epa.gov/AirToxScreen/2019-airtoxscreen-assessment-results>. Accessed August 2024.
- . 2022b. Technical Support Document EPA's Air Toxics Screening Assessment 2018 AirToxScreen TSD. Available at: [https://www.epa.gov/system/files/documents/2023-02/AirToxScreen\\_2018%20TSD.pdf](https://www.epa.gov/system/files/documents/2023-02/AirToxScreen_2018%20TSD.pdf). Accessed August 2024.
- . 2022c. Air Quality Modeling for the 2016v2 Emissions Platform Technical Support Document. Available at: [https://gaftp.epa.gov/aqmg/2016v2\\_Platform\\_Modeling\\_Data/AQ%20Modeling%20TSD\\_2016v2%20Platform\\_rev\\_2022\\_0119a.pdf](https://gaftp.epa.gov/aqmg/2016v2_Platform_Modeling_Data/AQ%20Modeling%20TSD_2016v2%20Platform_rev_2022_0119a.pdf). Accessed March 2024.
- . 2023a. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021. Available at: <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2021>. Accessed July 2024.
- . 2023b. Air Quality Design Values. Available at: <https://www.epa.gov/air-trends/air-quality-design-values>. Updated August 07, 2023. Accessed July 2024.
- . 2023c. Prevention of Significant Deterioration Basic Information. Available at: <https://www.epa.gov/nsr/prevention-significant-deterioration-basic-information>. Accessed July 2024.

- . 2023d. National Emissions Inventory Data, 2020 NEI data of both criteria and hazardous air pollutants including the Point, Nonpoint, Onroad Mobile, and Nonroad Mobile data, Tier 1 County Summaries for New Mexico (Region 6). Available at: <https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data>. Site last updated August 14, 2023. Accessed July 2024.
- . 2023e. EPA GHG Equivalencies Calculator. Available at: <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>. Accessed July 2024.
- . 2024a. EPA’s Voluntary Methane Programs for the Oil and Natural Gas Industry. Available at: <https://www.epa.gov/natural-gas-star-program>. Late updated February 7, 2024. Accessed August 2024.
- . 2024b. Criteria air pollutants NAAQS table. Available at: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>. Updated February 7, 2024. Accessed July 2024.
- . 2024c. Exposure Assessment Tools by Routes – Inhalation. Available at: <https://www.epa.gov/expobox/exposure-assessment-tools-routes-inhalation>. Accessed July 2024.

## **Appendix E – Mining and Reclamation Plan**

**Prepared For:**

Bureau of Land Management  
Farmington Field Office

# **Mining Operations and Reclamation Plan**

Menefee Mining Corporation  
Black Spring Mine  
Permit Area Expansion Project

**Date:**

March 27, 2023

**Prepared By:**

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2. Black Spring Mine and Proposed Expansion Area

## 1. Introduction

### 1.1 Project Title and Name of Applicant

This proposed project is identified as the Black Spring Mine Permit Area Expansion Project (Proposed Project). Menefee Mining Corporation (MMC) is the name of the applicant.

### 1.2 Project Location and Background

This Proposed Project is located adjacent to the existing Black Spring Mine operated by MMC, which is approximately 30 miles southwest of Cuba and 4 miles southwest of the Village of Ojo Encino, New Mexico, just off Star Lake Road (Figure 1). The existing operation is in the south half of the southwest quarter of Section 4, Township 15 N North, Range 5 West New Mexico Principal Meridian (NMPM). The new Proposed Project is in the south half of the southeast quarter of Section 4 and north half of the northeast into parts of Section 9, Township 19 North, Range 5 West (the Proposed Project site, Figure 2).

This Mining Operations and Reclamation Plan (MORP) is for the expansion of MMC's mining and reclamation operations at the Black Spring Mine to the east to allow extraction of known humate resources. The Project would continue to mine humate under its current Minimal Impact Mining Permit with the State of New Mexico. MMC operates the existing Black Spring Mine under a Minimal Impact Mining Permit (MIMP) with the New Mexico Mining and Minerals Division (MMD) under Permit No. MK026MN. The existing mine is immediately west of the Proposed Project area in Section 4 and the Permit Area covers 80 acres. It is also on federal land administered by the Bureau of Land Management Farmington Field Office (BLM/FFO). MMC plans to operate as they are currently, in accordance with its permit and a recently submitted a Permit Modification (Modification 22-1). This modification includes an increase in the design limit to 12 acres within the 80-acre Permit Area. This Proposed Project would expand the Permit Area to approximately 240 acres but maintain the current design limit. The available area within the perimeter of the Permit Area is limited by buffer zones around cultural resource avoidance areas. The design limit in the permit constrains total disturbance to areas less than 12 acres at any point in time. Once an area is mined and reclaimed within the design limit, new ground cannot be disturbed until the previous mine area is reclaimed and re-seeded. This sequence is repeated across the parts of the Permit Area that contain economic humate resources.

MMC has been mining at the Black Spring Mine since 2011, and prior to that they operated a humate mine near the Star Lake Pueblo, southwest of the site.

### 1.3 Purpose of the Project

The purpose of this project is to provide MMC with additional mineable humate resources to support their Production Plant in Cuba, New Mexico and the agricultural market for humate products.

### 1.4 Conformance with Bureau of Land Management Regulations

This MORP conforms to BLM regulations, as surface mines are required to have approved mining plans (25 CFR § 216.7 and 212.4). The exploration, development, and disposal of mineral material resources is managed by the BLM under 43 CFR Part 3600.

### 1.6 Regulatory Approvals

Several federal and state permits and approvals may be required for the Black Spring Mine Proposed Project. See Table 1, List for a list of anticipated permits and approvals.

**Table 1. List of Anticipated Permits and Actions**

Federal Agency/Regulation or Permit	
Bureau of Land Management	Mining Operations and Reclamation Plan Special Use Permits (Rights of Way, etc.)
Environmental Protection Agency	Stormwater Discharge Multi-Sector General Permit
U.S. Fish & Wildlife Service	Threatened and Endangered Species (Section 7 Consultation)
Mine Safety and Health Administration	Mine Identification Number Miner Training Program
State Agency/Regulation or Permit	
Mining and Minerals Division of EMNRD	Mine and Reclamation Permit under Mining Act
Game and Fish Department	Wildlife Consultation
New Mexico Environment Department	Surface and Ground Water Quality Consultation
Office of the State Engineer	Water Resource Consultation
State Historic Preservation Office	Cultural Clearances

### 1.7 Project Schedule

MMC would like to initiate construction of the access to potential humate resource areas and begin stripping overburden within the next several years. The sequence of mining and reclamation within the design limit and continue for up to 10 to 15 years, provided the project economics are shown for the resource with market demand.

### 1.5 General Environment

The existing environment of the Proposed Project area is described in an Environmental Assessment for the Black Spring Mine and surrounding area completed by Ecosphere (2011b). Additional cultural and biological surveys have been completed for the Proposed Project area. This POO supports the proposed

expansion of the Permit Area at the Black Spring Mine to include humate resources to the east in parts of Section 4 and Section 9 (Figure 2).

## 2. Applicant Information

### 2.1 Applicant

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### 2.3 Surface and Mineral Ownership

The surface and mineral are controlled by the BLM. MMC is allowed access to the mineral through expressions of interest and letters of intent to the BLM for humate resources in sections 4 and 9, Township 19 North and Range 5 West dated June 21, 2019, and December 8, 2022, respectively. MMC purchases the mineral material from BLM in accordance with a contract as part of their current mining operations at Black Spring Mine.

### 2.4 Right-of-Entry

The access to the Black Spring Mine and the Proposed Project area would come from the BLM. The entire area associated with the Black Spring Mine and the Proposed Project area are on BLM administered land. The existing road from the Star Lake Road to the Black Spring Mine is maintained by MMC.

### 3. Geology and Humate Resources

At the Black Spring Mine, humate is mined from open cuts in weathered coal beds in the uppermost part of the Cretaceous Fruitland Formation (Dames and Moore, Inc., 1979; Schneider and Kirschbaum, 1981). The Black Spring Mine is in the eastern part of the Star Lake Coal Field, which is described in Shomaker et al. (1971). The following geological discussion is from Newcomer et al. (2020):

*“Humate deposits also occur in some of the older Cretaceous sedimentary rocks that underlie the Fruitland Formation in the San Juan Basin. These humate deposits include the weathered coal and organic-rich shales in the Menefee and Crevasse Canyon Formations (Mesaverde Group) east and south of the Black Spring Mine (Roybal and Barker, 1987).*

*The Star Lake Coal Field is in the southeasternmost part of the San Juan Basin. The San Juan Basin is an asymmetric structural depression in northwestern New Mexico that also extends into a small part of northeastern Arizona, southern Utah and southern Colorado. According to Fassett and Hinds (1971), the depression contains sedimentary rocks of Cambrian, Devonian, Mississippian, Pennsylvanian, Permian, Triassic, Jurassic, Late Cretaceous, Tertiary and Quaternary age. The maximum known thickness of sedimentary rocks is at least 4300 m in the deepest part of the basin. Late Cretaceous rocks, of which the Fruitland Formation is part, are more than 1800 m thick. These rocks, which contain coal and humate deposits, consist largely of intertonguing marine and non-marine units that represent three basin-wide transgressive-regressive cycles of deposition (Fassett and Hinds, 1971).*

*The final regression of the Cretaceous seaway resulted in deposition of the marine Pictured Cliffs Sandstone (a point-bar sand deposit, with the sea on the northeast side and swampy areas on the south side between the bar and the land). The Pictured Cliffs Sandstone is overlain by and intertongues with the Fruitland Formation. The Fruitland Formation is overlain by the Kirtland Formation. With the withdrawal of the seaway, uplift within the southern Rocky Mountains, and structural deformation to the San Juan Basin, terrestrial sediments were deposited over the Kirtland strata. These later units included the Upper Cretaceous to Paleogene Ojo Alamo Sandstone and Paleogene to early Eocene Nacimiento Formation and San Jose Formation. In the Star Lake Coal Field, this deposition occurred episodically adjacent to the active Nacimiento uplift (Smith, 1992). Late Cretaceous and Paleogene terrestrial strata record the local disruption and partitioning of the Cretaceous foreland basin and retreat of the seaway by Laramide time (~65 million years ago).*

*The Fruitland Formation thickness in the San Juan Basin ranges between 61 and 91 m. In the Star Lake field area, the Fruitland Formation is thinner, ranging from 15 to 30 m due to depositional thinning in the eastern part of the San Juan Basin and erosion prior to deposition of the Ojo Alamo Sandstone.*

*Since the Fruitland Formation grades upwards into the Kirtland Formation, it is somewhat arbitrarily mapped as it varies spatially. Smith (1992) provided a summary of the stratigraphy of these rocks in the southeastern part of the San Juan Basin and indicated that the top of the Fruitland Formation should be mapped at the top of the highest coal bed or carbonaceous shale bed (or a correlative thin shale) above the last coal (Ayers et al., 1990; Hoffman et al., 1992).*

*The Fruitland Formation, in the Star Lake Coal Field, dips generally from one to five degrees to the north-northwest (Hoffman et al., 1992). In the Black Spring Mine area, the Fruitland and associated coal/humate beds occur approximately parallel to the depositional strike (essentially parallel to the shoreline of the Cretaceous seaway). The terrestrial direction was south-southwest, and the sea was to the north-northeast.*

*The Fruitland Formation contains an abundant record of biota that lived along part of the western shore of North America in the Late Cretaceous (Lucas and Mather, 1983). Fruitland strata are also the major coal-bearing unit in Upper Cretaceous rocks, and it reflects depositional environments associated with extensive marshy habitats (Hunt and Lucas, 1992). Detailed sedimentology indicates the Fruitland Formation was deposited as mixed terrestrial-marine facies along a shoreline locally influenced by deltaic complexes that developed along river systems and extended into the sea. Surface drainages associated with these river systems flowed to the northeast at approximate right angles to the Cretaceous seaway coastline. The overlying Kirtland Formation sediments are largely fluvial in nature and formed as the land advanced to the northeast and the seaway retreated in that direction. These fluvial systems were believed to be low sinuosity meandering and braided streams with well-drained floodplains. With the migration of the seaway north-eastward, no more coal was formed. Fruitland Formation depositional environments represent a transitional phase between completely marine and completely continental deposits during shoreline regression. Periods when the rate of retreat of the shoreline was slow, relatively stable swamp areas developed, which resulted in thicker coal deposits in the lower part of the Fruitland (e.g., the Carbonero bed, with a thickness of up to 24 m of coal and partings).”*

**The humate resource and occurrence has been described as follows (Newcomer, 2020):**

*“Most of the mining of humate has focused on the thicker, near-surface, deposits that are close to processing facilities in Cuba, New Mexico. The Black Spring Mine is permitted as a Minimal Impact Mine Project under the New Mexico Mining Act and began operations in 2011. The humate is mined from shallow*

*cuts, and, as mining is advanced into new areas, the old cuts are concurrently reclaimed. Using loaders, the run-of-mine material is transported by truck to a production plant in Cuba, New Mexico. The material is stockpiled at the plant, crushed and screened to uniform particle-size fractions, and bagged for sale (granular products; Earthgreen Products Inc., 2020). The finest size fraction is dissolved in water and then dried to form a concentrated water-soluble powder (powdered products). This material is packaged in drums for sale.”*

## 4. Mining Plan

The operations for the expanded Black Spring Mine in Sections 4 and 9 of Township 19 North Range 5 West will consist of a sequence of mining areas. The sequencing is based on the mineable reserves, where open pits would and could be excavated within the constraints of the Minimal Impact Mining Permit (mining related disturbances less than the permit’s design limit acreage at a time) and cultural resource buffer areas and roadways. Movable reserves are expected to occur within the 240-acre proposed mining areas (Permit Area Expansion) shown in Figures 2. The humate thickness and quality vary and MMC estimates that the humate thickness across the area averages approximately 6 feet and is relatively continuous. Approximately 1 to 15 feet of overburden is expected to be removed in 2- to 3-acre increments as an individual open pit progresses. Overburden would be salvaged separately and placed in designated stockpile areas next to the pit for use in backfilling, regrading and reclamation.

### 4.1 Operations

MMC proposes to operate the mine Monday through Friday and occasionally Saturday from 7:30 am to 3:00 pm during year, except for holidays (New Year’s Day, Easter, Memorial Day, July 4, Labor Day, Thanksgiving, and Christmas) and inclement weather in the winter months.

### 4.2 Stage I: Initial Mine Operation Setup

#### Step 1: Protection of Cultural Resources

The Class III Cultural Resource Inventory Report identified cultural sites eligible for listing on the National Register of Historic Properties. These areas, with a buffer, will be fenced and avoided. If previously undocumented cultural sites are encountered during mining, all activities will stop near the discovery. The site would then be evaluated. Mitigation measures such as data recovery may be required to prevent impacts to newly identified cultural resources.

#### Step 2: Designation of the Initial Staging and Stockpile Area

A 3-acre initial staging and stockpile area would be in Area 1 during the first phase of mining. A staging area large enough to accommodate storage of personnel vehicles, mining equipment, materials, and

supplies, and a secondary containment area for storage of fuel and hazardous materials would be designated. The remainder of the area would be designated for stockpile overburden from the mining operations. Relocation of the staging/stockpile area during mining and reclamation operations would be minimized as much as possible; however, as mining and reclamation activities progress, the staging area would be moved at least once to allow for extraction of the humate beneath that staging area.

#### 4.3 Stage II: Mining

Humate would be mined from open pits in the proposed mining areas in phases, as described below. The pit size is usually restricted to about 1 to 3 acres at any one time.

##### **Step 1: Removal of Overburden**

Overburden would be removed using a bulldozer and stockpiled in the designated location adjacent to the active pit, for reuse during reclamation. Overburden would be removed in 1/2-acre increments within each mining area, with no greater than 2 to 4 acres of excavated overburden stockpiled at any given time. Topsoil would not be segregated.

Stockpiles would be located and protected so that wind and water erosion are minimized, and reclamation potential is maximized. The overburden would be stockpiled at angle of repose and left undisturbed until reclamation activities commence to limit susceptibility to wind erosion. Berms would be used as necessary to control stormwater runoff and run-on. Erosion control and slope stabilization measures for the stockpiles would be implemented.

##### **Step 2: Removal of the Humate**

Open pits would be developed by removing overburden to expose the ore zone. The pits would be benched and limited in extent and height. Humate would be mined using a front-end loader or track-hoe and 36-foot end-dump trailers. During mining, berms and grading would be used around the pit to control stormwater run-on. Berms would be used a slope stabilization structures to control runoff within the proposed mine-development area.

##### **Step 3: Product Verification & Delivery of the Humate**

Humate would be delivered to MMC's processing facility in Cuba, New Mexico, for processing. Daily production rates would be determined based on weight logs recorded for each load at the truck scales at the processing facility. Copies of all records would be kept at the MMC's processing facility office in Cuba, New Mexico.



#### **Step 4: Reclamation**

Reclamation would be performed contemporaneously with mining. As new pits are developed for mining, the overburden removed is used to backfill previously mined pits.

#### **4.4 Stage III: Reclamation/Final Closure of Project Site**

##### **Step 1: Final Mine Activity: Reclamation**

Final reclamation of each 12-acre mining area would include: 1) all remaining mine areas, stockpile areas, and staging areas would be re-contoured to approximate natural contours and to promote positive drainage to the surrounding undisturbed landscape; 2) reclaimed slopes would not exceed 4H:1V; and 3) the re-contoured surfaces would be re-vegetated using the MMD and BLM approved reclamation seed mix.

##### **Step 2: Monitoring and Maintenance**

All reclamation areas within the Project site would be monitored for re-vegetation success. Re-seeding would occur as necessary to achieve re-vegetation success. Invasive/noxious weed species would be monitored and treated.

##### **Step 4: Final Closure**

When reclamation success has been determined by MMD and BLM, each 12-acre mined area would be considered Closed. The financial assurance that is in place would be rolled to the next disturbance area, except for an amount held for potential reseeded.

#### **4.5 Security and Fencing**

A 4-strand barbed wire perimeter fence will be installed around the 'active' project area, which would usually include the disturbance and anticipated disturbance areas associated with the design limit of the mining permit. A gate, with a lock, will be installed on the access road off of the main Star Lake Road. This gate will be locked after normal business hours to prohibit unauthorized entrance.

## **5. Workforce Requirements**

The Proposed Project would employ two to three full-time employees working 8-hour shifts, five to six days a week (Monday through Saturday), excluding holidays. Work would occur from 7:30 a.m. to 3:00 p.m. All vehicles would be restricted to the existing access roads and active mining operations. No vehicles would be operated on the reclaimed areas except for reclamation maintenance or rehabilitation activities.

## 6. Equipment

The following equipment for each phase of the Project would be operated by the employees:

Table 2: Equipment Required for Mining Operations

Equipment	Stage I (Initial Setup)	Stage II (Operation)	Stage III (Reclamation/closure)
Front-End Loader		X	X
Track-hoe		X	X
Bulldozer	X	X	X
Haul Truck & 36-foot End Dump Trailer		X	X
Portable Toilet	X	X	X

## 7. Materials and Supplies

No material or supplies will be stored on site. Equipment would be service from the Production Plant in Cuba, New Mexico.

## 8. Reclamation Plan

### 8.1 Objective

The reclamation objective for the Proposed Project is to reclaim the ground disturbances to a condition as good as or better than the pre-mining surface. The reclaimed mine areas would be a self-sustaining ecosystem matching the undisturbed characteristics surrounding the mine areas. Pre-mining land use is livestock grazing and wildlife habitat. Post-mining land use is expected to be the same or similar. The objective is to return the ground disturbances to a stable landscape by minimizing erosion and re-establishing vegetation. Current requirements presented in the 2011 Black Spring Mine mining and reclamation plan (Ecosphere, 2011) includes preventing the following conditions: 1) Large rills or gullies (greater than 3 inches wide or deep); 2) Perceptible soil movement or head cutting in any drainage; and 3) Slope instability on or adjacent to the reclaimed area.

### 8.2 Visual Resource Standards

The reclaimed landscape would approximate the visual quality of adjacent and surrounding areas with regard to surface contouring, drainage patterns, and vegetation. Disturbed ground, staging areas, access roads, and the Proposed Project site would be re-graded to restore as near-natural contours as feasible. All ground disturbances would be re-vegetated using the MMD approved seed-mix (Table 3).

### 8.3 Reclamation Sequence

Contemporaneous reclamation enables MMC to limit the ground disturbance and open pits in accordance with the Minimal Impact Mining Permit. As new pits are developed for mining, the overburden removed is used to backfill previously mined pits. Once a pit has been completely backfilled, preliminary reclamation would be initiated. This reclamation pattern, concurrently closing old pits with overburden removed to create new pits, would continue through the entire excavation portion of the mining operation. The mining and reclamation work described here does not include weather contingencies, but reclamation activities that cannot be completed due to weather should be completed as soon as the weather allows, limiting the exposure of non-reclaimed surfaces.

### 8.4 Reclamation Activities

The following are the key activities associated with reclamation of disturbed lands:

#### 8.5 Surface Recontouring

Open pit areas would be backfilled with stockpiled overburden. Soils would then be contoured (graded) to match original slopes as closely as practicable, providing a level or convex-free draining surface. Depressions where water could collect would be allowed, per landowner request, and overall drainage patterns of final grading would match the pre-mining patterns.

#### 8.6 Seedbed Preparation

All disturbed and particularly compacted soils would be ripped to a depth of 12 inches parallel to the contours of the slope to create furrows for seeding.

#### 8.7 Seeding

Seed would be sowed across the mine reclamation areas by broadcasting. The quantity of seed with broadcast seeding is twice the amount that is recommended due to windblown loss and inefficiencies in application. Hydroseeding is not recommended for native seeds due to poor seed-soil contact percentage, and the tendency of the seed to self-sort by weight and size, and therefore resulting in uneven application distribution. Certified weed free mulch would be used to stabilize the seed and soil. The mulch would be crimped approximately 3 to 4 inches into the soil surface using a disc harrow on contour.

Table 3: Seed Mix to be Used at Proposed Project Site

Species	Variety	Percent of Seed Mix
Indian ricegrass ( <i>Achnatherum hymenoides</i> )	Paloma or Rimrock	19
Blue grama ( <i>Bouteloua gracilis</i> )	Alma	7
Slender Wheatgrass ( <i>Agropyron trachycaulum</i> )	San Luis	19

Alkali Sacaton ( <i>Sporobolus airoides</i> )	VNS	10
Western wheatgrass ( <i>Pascopyrum smithii</i> )	Arriba	23
Crested Wheatgrass ( <i>Agropyron cristatum</i> )	Hy-Crest	2
Fourwing saltbush ( <i>Atriplex canescens</i> )	High Elev	19
<b>Total</b>		100

### 8.8 Reclamation Protection

During and after reclamation, MMC would monitor and protect the reclaimed landscape to help ensure reclamation success to the landowners' and MMD's requirements. Berms or other erosion-control features may be utilized to protect reclaimed surfaces until vegetation is established.

### 8.9 Invasive/Noxious Species Control

Noxious weed control is a BLM-required compliance action for surface reclamation. The objective of the BLM/FFO weed management program is to detect invasive plant populations, prevent the introduction of new invasive populations, control the spread of existing populations using the tools of integrated weed management, and eradicate invasive populations using the safest environmental methods available. Preventing the introduction of noxious weeds into an area is the most effective and economical means of weed control and management.

The BLM/FFO's invasive, non-native plant species of concern, and the management protocol for each, is provided in Table 4. Only one of the listed species was observed during the biological survey, Halogeton (*Halogeton glomeratus*) was identified.

**Table 4: Invasive, Non-Native Plant Species of Concern to the BLM/FFO**

Common Name	Scientific Name	Management Class
Camelthorn	<i>Alhagi maurorum</i>	A - Prevent and eliminate
Woolyleaf bursage	<i>Ambrosia grayi</i>	A - Prevent and eliminate
Onionweed	<i>Asphodelus fistulosus</i>	A - Prevent and eliminate
Diffuse knapweed	<i>Centaurea diffusa</i>	A - Prevent and eliminate
Spotted knapweed	<i>Centaurea maculosa</i>	A - Prevent and eliminate
Malta star thistle	<i>Centaurea solstitialis</i>	A - Prevent and eliminate
Yellow starthistle	<i>Centaurea solstitialis</i>	A - Prevent and eliminate
Houndstongue	<i>Cynoglossum officinale</i>	A - Prevent and eliminate
Dyer's woad	<i>Isatis tinctoria</i>	A - Prevent and eliminate
Tall whitetop (perennial pepperweed)	<i>Lepidium latifolium</i>	A - Prevent and eliminate

Dalmatian toadflax	<i>Linaria dalmatica</i>	A - Prevent and eliminate
Yellow toadflax	<i>Linaria vulgaris</i>	A - Prevent and eliminate
Purple loosestrife	<i>Lythrum salicaria</i>	A - Prevent and eliminate
African rue	<i>Peganum harmala</i>	A - Prevent and eliminate
Jointed goatgrass	<i>Aegilops cylindrica</i>	B - Contain and prevent
Canada thistle	<i>Cirsium arvense</i>	B - Contain and prevent
Leafy spurge	<i>Euphorbia esula</i>	B - Contain and prevent
Black henbane	<i>Hyoscyamus niger</i>	B - Contain and prevent
Scotch thistle	<i>Onopordum acanthium</i>	B - Contain and prevent
Hoary cress (whiteweed)	<i>Cardaria draba</i>	C - Manage and suppress
Musk thistle	<i>Carduus nutans</i>	C - Manage and suppress
Russian knapweed	<i>Centaurea repens</i>	C - Manage and suppress
Bull thistle	<i>Cirsium vulgare</i>	C - Manage and suppress
Russian olive	<i>Elaeagnus angustifolia</i>	C - Manage and suppress
Saltcedar	<i>Tamarix spp.</i>	C - Manage and suppress

Halogeton is listed as a New Mexico Department of Agriculture (NMDA) Class B species (2009). “Class B species are limited to portions of the state. In areas with severe infestations, management should be designed to contain the infestation and stop any further spread” (NMDA, 2009). It is highly toxic to both sheep and cattle; however, the toxicity potential for harm can depend on livestock health, site conditions and plant maturity (USDA, 2014).

MMC would take all reasonable precautions to prevent the introduction, establishment, and spread of Halogeton and any other noxious weeds found in and around the Proposed Project site. MMC may implement the following control measures for Halogeton: 1) physically remove small, localized infestations; 2) re-vegetate with perennials (Halogeton is a poor competitor); and 3) treat affected areas with 2,4-D (2,4-dichlorophenoxyacetic acid) LV ester at 1 to 2 pounds of acid equivalent per acre when plants are actively growing, before flowering (USDA, 2014).

General noxious weed treatment and control would be repeated, as necessary, to promote re-vegetation with native plants and prevent the spread of noxious weeds. Control measures would be implemented before, during, and after mining and reclamation prevent the introduction of undesirable plant species, and to reduce the spread of noxious weeds. These control measures could include: 1) Removing all mud, dirt, and plant parts from all off-road equipment used at other locations before moving them into the Proposed Project site;

2) Using only defined and established access roads to minimize ground disturbance; and 3) Using only certified weed-seed-free straw mulch during reclamation.

The mine owner would be responsible for weed control on disturbed ground and reclaimed areas within the limits of the Proposed Project site and associated access roads. The mine owner would be responsible for consulting with the BLM and/or local authorities for acceptable weed control measures. During mining operations, any noxious or invasive plants observed within the Proposed Project site would be treated consistent with the BLM/FFO and the McKinley County Noxious Weed Management Program (2010) standards.

Use of pesticides and herbicides shall comply with applicable federal/state laws. Pesticides and herbicides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior.

## 9. Environmental Management and Mitigation

### 9.1 Stormwater Management

A SWPPP would be implemented and maintained through the life of the Project and following—until final reclamation has been achieved. The Black Spring Mine SWPPP has been amended to include the Project (Appendix B). The mine would also be permitted under an MSGP, with at least quarterly inspections and annual reporting to the Environmental Protection Agency (EPA). Hazardous materials in the form of fuel and lubricants for the mining equipment and vehicles would be contained in designated areas, and within secondary containment.

### 9.2 Cultural, Historic and Paleontological Resources

Known and documented cultural resources will be fenced with a buffer. MMC will inform their employees and visitors about relevant federal regulations intended to protect cultural and paleontological resources and about the sensitivity of designated cultural resources.

If any cultural or paleontological resources are unearthed or otherwise encountered during the construction or mining activities, such activities will cease in the area of discovery, and the BLM will be notified that such resources can be identified, and appropriate resource protection measures developed and implemented per BLM and the SHPO requirements.

### 9.3 Erosion and Sediment Control Measures

Stormwater management will be implemented for the project area to include the construction and maintenance of berms and diversions, as necessary, to route runoff away from pit areas and contain impacted runoff and keep it from leaving the property. No earth moving activities will occur when the soils

are too wet to support heavy equipment. Should heavy precipitation occur in the area, construction and mining work will be delayed until soil conditions improve. Travel across drainages will be restricted to existing roads. MMC will maintain a compact operation with implementation of concurrent reclamation activities, restricted to the permitted design limit.

#### 9.4 Health and Safety

Mining and reclamation operations would be designed and operated to safeguard employees and the public. Signs with “Caution” and “Unauthorized Personnel-Keep Out” would be posted at the site entrances. Pit side slopes would be benched and limited in height and extent. During mining, berms and grading would be used around the pit to control stormwater run-on. Berms would be used slope-stabilization measures to control stormwater runoff within the Proposed Project site. Final slopes of all reclaimed areas would not be steeper than 4H:1V. Shafts, adits, and tunnels are not part of the humate mining process, and therefore would not endanger personnel or the public. All mine vehicles would be required to follow posted speed limits, and all vehicles would adhere to load limits outlined by the New Mexico and Navajo DOT. Right-of-way would be given to the residents and other non-commercial traffic. Loads would be covered according to New Mexico DOT standards to avoid damage to windshields, etc. Travel speeds on the unimproved ‘dirt’ roads would be limited to reduce the amount of dust.

#### 9.5 Livestock Grazing

MMC will implement noxious weed monitoring and control as part of its activities to preclude the spread of such undesirable species into adjacent rangeland. Project activities will be kept as compact as possible to minimize disturbances. Surface facility areas will be fenced to preclude livestock access to the site. Reclamation will return disturbed sites to a productive condition concurrent with the development of new mine areas and at final closure.

#### 9.6 Noise

The project is in a relatively unpopulated, remote area. Most of the activities will occur during daylight hours. There are no occupied residences or potentially sensitive human receptors in the immediate vicinity of the site. There is traffic on Star Lake Road, adjacent to the site. MMC and its contractors will maintain surface equipment in order to minimize noise. An access road speed limit of 15 miles per hour will be implemented to minimize noise impacts from truck traffic. MMC will adhere to MSHA requirements governing worker health and safety that includes requiring hearing protection for workers in equipment and in high noise areas.

### 9.7 Recreation

Only authorized travel will be allowed into the MMC Black Spring Mine area. Access will be controlled by fencing and posting to prohibit unauthorized entry. MMC will prohibit firearm use at the site, as well as prohibiting hunting in the fenced areas.

### 9.8 Road Construction and Maintenance

MMC plans to perform maintenance on all access roads in the site area.

### 9.9 Soils

MMC will protect overburden that contains soils as potential growth medium material when mine areas are stripped. This salvaged growth medium will be stockpiled either in windrows adjacent to the pits or will be maintained in larger piles near the operation. Growth medium will be located out of drainages to prevent erosion. Salvaged growth medium will be used in concurrent reclamation and final reclamation. A noxious weed monitoring program will be implemented to prevent noxious weeds from colonizing the stockpiled material.

### 9.10 Trash and other Waste Material

Waste bins will be provided on site for trash and refuse. Litter will be prohibited. The bins will be picked up periodically or as necessary and transferred to the waste disposal facilities at the Production Plant in Cuba, New Mexico. Spill protection supplies will be kept on vehicles and equipment to manage any uncontrolled releases. If they occur, the spills will be contained and the spill and impacted soils will be managed consistent with State environmental regulations.

### 9.11 Vegetation

MMC will minimize disturbance of vegetation by maintaining a compact operation. Vegetation will be cleared only in roadway and mined out areas. Mine areas will be ripped and reseeded concurrent with advancing the mining to new locations. Roads that become unused, will be reclaimed.

## 10. References

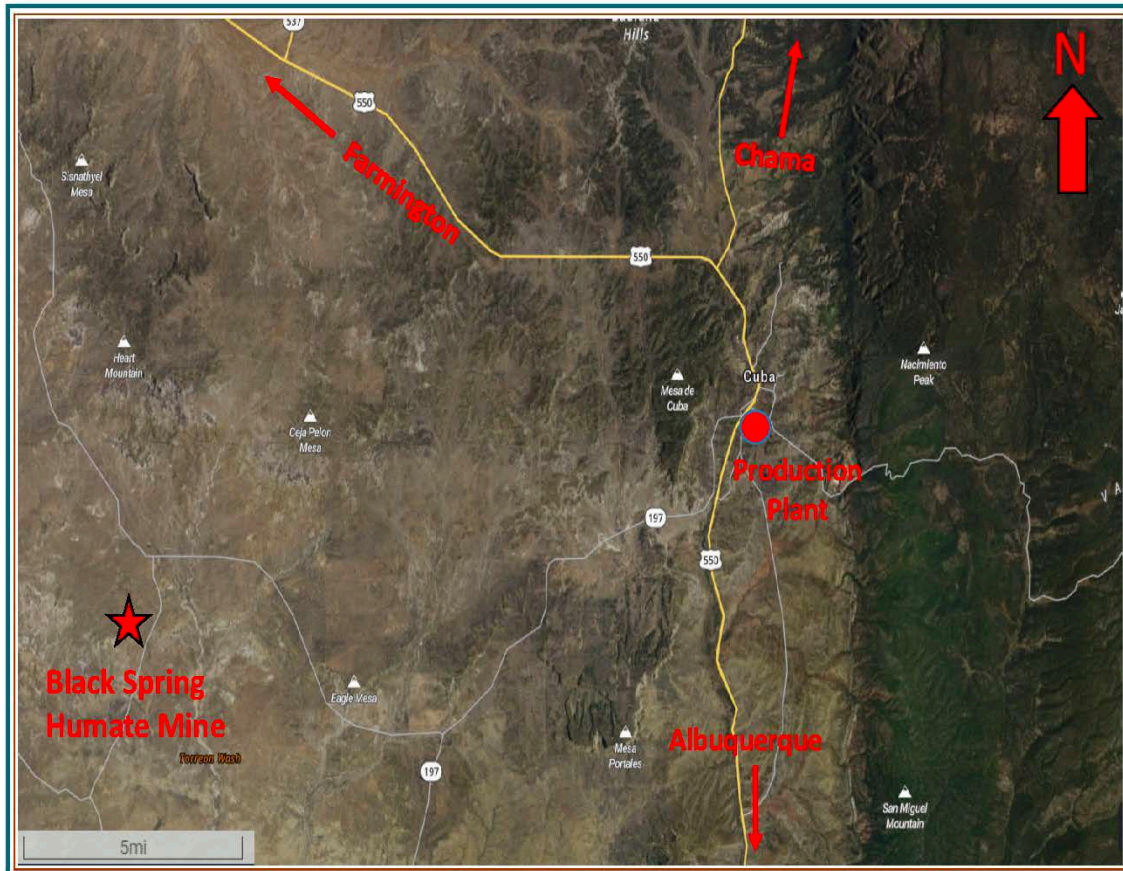
- Ayers, W.B., Jr., Kaiser, W.R., Ambrose, W.A., Swartz, T.E., Laubach, S.E., Tremain, C.M., and Whitehead, N.H., III., 1990, Geologic evaluation of critical production parameters for coalbed methane resources, Part 1 - San Juan Basin: Gas Research Institute, Contract No. 5087-214-1544, Annual Report, 175 p.
- Beaumont, E.C. and Hoffman, G.K. 1992. Interrelationships between the upper coal member of the Menefee Formation, the La Ventana Tongue, and the Lewis Shale in the southeastern San Juan Basin, New Mexico: New Mexico Geological Society Guidebook 43. p. 207-216.



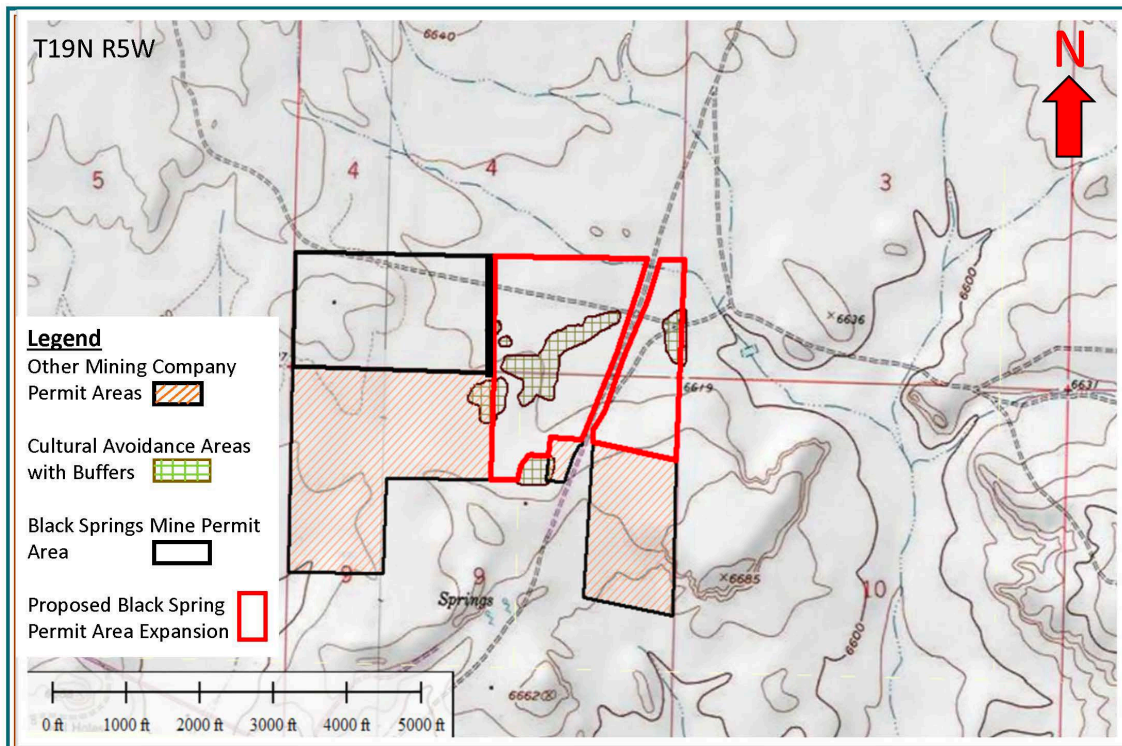
- Bureau of Land Management (BLM). 1992. Mineral Reclamation Handbook. Noncoal leasable minerals, locatable minerals, salable minerals. BLM Handbook H-3042-1. Bureau of Land Management, Farmington Field Office, Farmington, NM. Unpublished data.
- Dames and Moore, Inc., 1979, Coal resource occurrence maps and coal development potential maps of the Star Lake Quadrangle, McKinley and Sandoval Counties, New Mexico: U.S. Geological Survey, Open-File Report 79-115, 27 p., 16 plates.
- Dick-Peddie, William A. 1993. New Mexico Vegetation: Past, Present, and Future. University of New Mexico Press. Albuquerque, New Mexico.
- Dreesen, David R. No Date. Seeding Native Grasses in the Arid Southwest. USDA-NRCS Plant Materials Center, Los Lunas, NM. 8 pp.
- Earthgreen Products Inc., 2020, <<http://www.earthgreen.com/>>, (accessed February 19, 2020).
- Ecosphere Environmental Services (Ecosphere) 2011a. Black Spring Humate Mining and Reclamation Plan. Prepared for MMC. March 2011.
- Ecosphere. 2011b. Environmental Assessment - Black Spring Humate Mine, McKinley County, New Mexico. Prepared for BLM/FFO. May 2011.
- Essington, M.E., 2004, Soil and Water Chemistry – An Integrative Approach: Boca Raton, CRC Press LLC, 534 p.
- Fassett, J.E., and Hinds, J.S., 1971, Geology and Fuel Resources of the Fruitland Formation and Kirtland Shale of the San Juan Basin, New Mexico and Colorado: U.S. Geological Survey, Professional Paper 676, 76 p.
- Hoffman, G.K., and Austin, G.S., 2006, Soil Amendments, in Kogel, J.E., Trivedi, N.C., Barker, J.M., and Krukowski, S.T., eds., Industrial Minerals and Rocks (7th ed.): Littleton, Society for Mining, Metallurgy and Exploration, Inc., p. 1161-1172.
- Hoffman, G.K., Beaumont, E.C., and Bellis, D., 1992, Environmental controls related to coal quality variations in the Fruitland Formation, San Juan Basin, New Mexico: Geological Society of America, Special Paper 267, p. 37-55.
- Hoffman, G.K., Verploegh, J., and Barker, J.M., 1994, Geology and chemistry of humate deposits in the southern San Juan Basin, New Mexico: Society of Mining Engineers. Presentation at SME Annual Meeting Albuquerque, NM, February 14-17, 1994, Preprint 94-142.
- Hunt, A.P., and Lucas, S.G., 1992, Stratigraphy, paleontology and age of the Fruitland and Kirtland Formations (Upper Cretaceous), San Juan Basin, New Mexico: New Mexico Geological Society, Guidebook 43, p. 217- 239.

- Lucas, S.G., and Mateer, N.J., 1983, Vertebrate paleoecology of the Late Campanian (Cretaceous) Fruitland Formation, San Juan Basin, New Mexico (USA): Second Symposium on Mesozoic Terrestrial Ecosystems, Jadwisin, Poland, v. 28, n. 1-2, p. 195-204.
- McKinley Soil and Water Conservation District (MSWCD). 2010. Noxious Weed Removal Program. [http://mckinleyswcd.com/noxious\\_weeds\\_removal\\_program.htm](http://mckinleyswcd.com/noxious_weeds_removal_program.htm). Accessed January 2011.
- McLemore, V.T., R.F. Broadhead, K. Cook, W.L. Chenoweth, J.L. Barker, G. Roybal, R.M. North, P. Copeland, M.R. Bowie, J.S. Hingtgen, K. Klein, and K.B. Brown. 1986. A preliminary mineral-resource potential of San Juan County, Northwestern New Mexico. New Mexico Bureau of Geology and Mineral Resources Open-file Report 232. p. 106-108.
- Moore, S.J., Anderholm, S.K., Williams-Sether, T. and Stomp, J.M. 2003. Sources of water to the Rio Grande upstream of San Marcial, New Mexico. United States Geological Survey Fact Sheet 110-03.
- Newcomer, R., Nybo, J. and Newcomer, J. 2021. Humate in the Upper Cretaceous Fruitland Formation in Northwestern New Mexico., New Mexico Geological Society, Guidebook 71. [also published electronically as Newcomer, R., Nybo, J. and Newcomer, J. 2020. Humate in the Upper Cretaceous Fruitland Formation in Northwestern New Mexico., New Mexico Geological Society, Special Publication 14 (2020)], pp 153-158.]
- New Mexico Department of Agriculture (NMDA). 2009. New Mexico Noxious Weed List Update. New Mexico State University. April 1, 2009.
- Nickelson, H.B., 1988. One hundred years of coal mining in the San Juan Basin, New Mexico. New Mexico Bureau of Geology and Mineral Resources Bulletin 111. p. 91-97.
- Roybal, G.H., and Barker, J.M., 1987, Geology and production of humate and weathered coal in New Mexico: Society of Mining Engineers, Transactions, v. 280, p. 2105.
- Schneider, G.B., and Kirschbaum, M.A., 1981, Coal resources of the Fruitland Formation, Ojo Encino EMRIA study site, McKinley County, New Mexico: U.S. Geological Survey, Open-File Report 81-783, 23 p.
- Scott, G.R., J.W. Mytton, and G.B. Schneider. 1980a. Geologic map of the Star Lake Quadrangle, McKinley County, New Mexico. USGS (US Geological Survey) Publication Miscellaneous Field Studies Map 1248.
- Scott, G.R., Schneider, G.B. and Mytton, J.W.. 1980b. Geologic map of the Ojo Encino Mesa Quadrangle, McKinley and Sandoval Counties, New Mexico. USGS (US Geological Survey) Publication Miscellaneous Field Studies Map 1249.

- Shomaker, J.W., Beaumont, E.C., and Kottowski, F.E., eds., 1971, Strippable low-sulfur coal resources of the San Juan Basin in New Mexico and Colorado: New Mexico Bureau of Mines and Mineral Resources, Memoir 25, p. 15-30.
- Shomaker, J.W., and Hiss, W.L., 1974, Humate mining in northwestern New Mexico: New Mexico Geological Society, Guidebook 25, p. 333-336.
- Smith, L.N., 1992, Stratigraphy, sediment dispersal and paleogeography of the Lower Eocene San Jose Formation, San Juan Basin, New Mexico and Colorado: New Mexico Geological Society, Guidebook 43, p. 297-309.
- Soil Survey Staff, 2014. Web Soil Survey. Natural Resources Conservation Service, U.S. Department of Agriculture. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed September 15, 2014
- USDA. 2014. The PLANTS Database. Available online at: <http://plants.usda.gov> NRCS, National Plant Data Team, Greensboro, NC 27401-4901 USA. Accessed on September 15, 2014.
- U.S. Department of the Interior and United States Department of Agriculture. 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development. BLM/WO/ST-06/021+3071/REV 07. Bureau of Land Management. Denver, Colorado. 84 pp.
- Western Regional Climate Center. New Mexico Climate Summaries Black Spring, New Mexico (298524). Available online at: <http://wrcc@dri.edu> Accessed on September 15, 2014.



PROJECT: -	TASK: -	<b>Figure 1. Menefee Mining Corporation Mining and Production Facilities Location Map</b>	PREPARED FOR:
PREPARED BY:			



PROJECT	TASK
PREPARED BY:	

**Figure 2. BLACK SPRING MINE AND PROPOSED EXPANSION AREA**

PREPARED FOR:
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# **Appendix F – Paleontological Survey Report**


**Menefee Mining Corporation**  
**Black Spring Humate Mine Expansion**  
**Paleontological Resources Survey Summary Report**



Kate Zeigler, Ph.D., CPG

May 23, 2024

BLM Permit No. NM 16-02C

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## Introduction

Menefee Corporation is considering expansion for the Black Spring Humate Mine, and as a part of the expansion plan, they propose to drill exploratory test holes on Bureau of Land Management (BLM) administered land south of Ojo Encino, New Mexico. The surrounding landscape includes broad, low badland exposures of the Upper Cretaceous Fruitland and Kirtland Formations, which are well known for hosting scientifically important fossil resources throughout western New Mexico. The area to be targeted includes the southeast  $\frac{1}{4}$  of section 4 and the northeast  $\frac{1}{4}$  of section 9, Township 19 N, Range 05 W (New Mexico Prime Meridian). Under the Minimal Impact Exploration permit, expansion would not disturb more than five acres and no new roads would be developed. If expansion of the existing mine is deemed to be feasible, new mining would be limited to less than 10 acres of disturbance, including any access roads. The Fruitland-Kirtland Formations have been designated a Potential Fossil Yield Class (PFYC, see Appendix I) 5 area, which is high risk for paleontological resources. As such, a pedestrian survey of the 160-acre area encompassing the proposed exploratory drill sites is required.



Figure 1. Google Earth satellite imagery showing the project area with geologic interpretation annotations for the area surveyed.

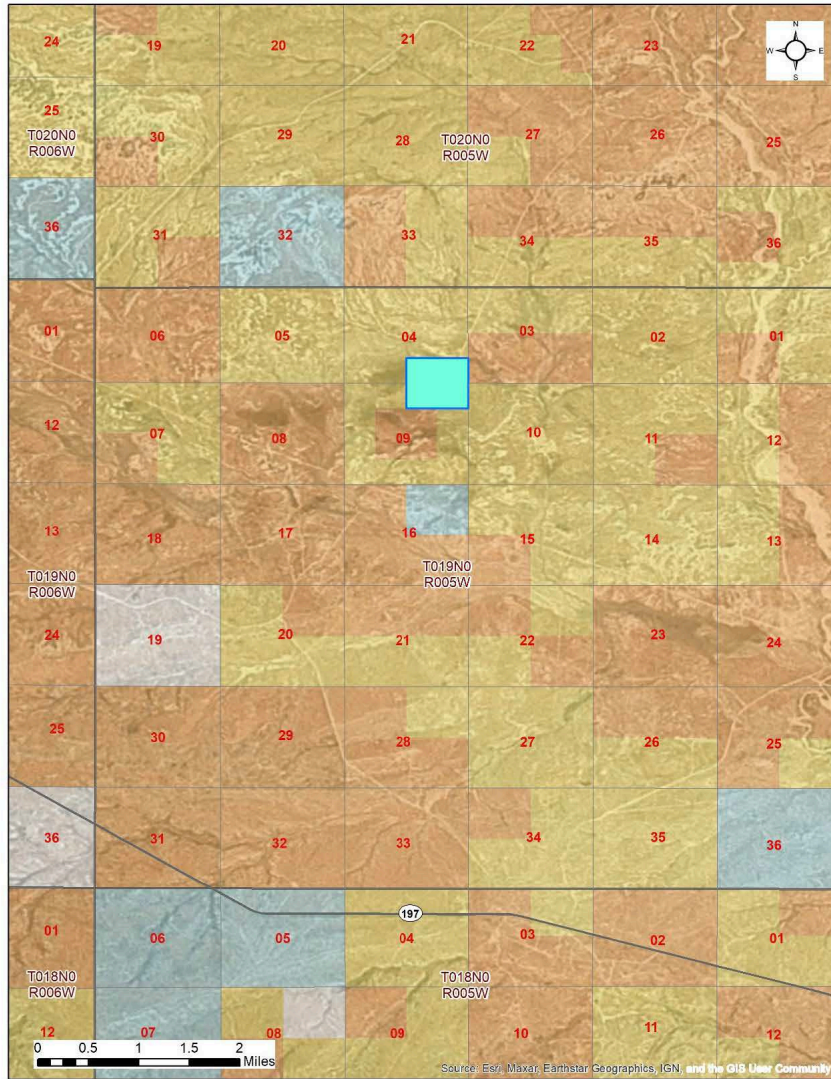


Figure 2. Map of the project area (blue box) with land status. Orange = Bureau of Indian Affairs, yellow = Bureau of Land Management, blue = State of New Mexico, white = private.

### Background Geology

The San Juan Basin is a large, asymmetric syncline in northwestern New Mexico (Figure 3) that is bounded by the Hogback monocline to the northwest, the Archuleta anticlinorium to the northeast, the Nacimiento Uplift to the east and the Chaco homocline (or slope) to the south (Cather, 2004). It hosts some of the state’s most critical extractive resources, including oil, natural gas, coal, coal-bed methane, and humate. Strata preserved in the San Juan Basin range in age from Late Triassic along the outer margins to Eocene in the center. In the vicinity of Ojo Encino, Cretaceous sedimentary rocks include the Upper Cretaceous Pictured Cliffs Sandstone, Kirtland-Fruitland Formation, and overlying Paleocene Ojo Alamo Sandstone (Figure 4). The strata record the final retreat of the Cretaceous Interior Seaway as the landscape transitioned from marine to nearshore (Pictured Cliffs Sandstone) to mixed deltaic and estuarine (Kirtland-Fruitland Formation) to entirely terrestrial (Ojo Alamo Sandstone).

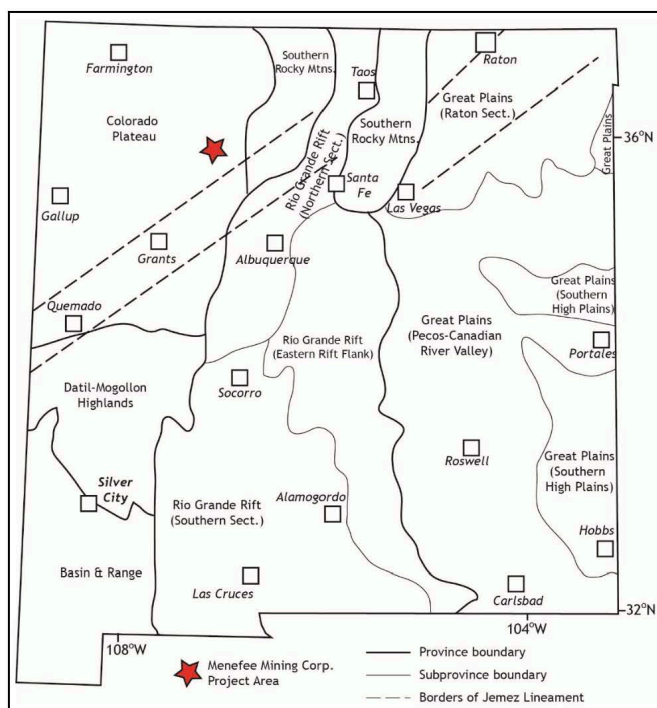


Figure 3. Physiographic provinces of New Mexico (after Pazzaglia and Hawley, 2004).

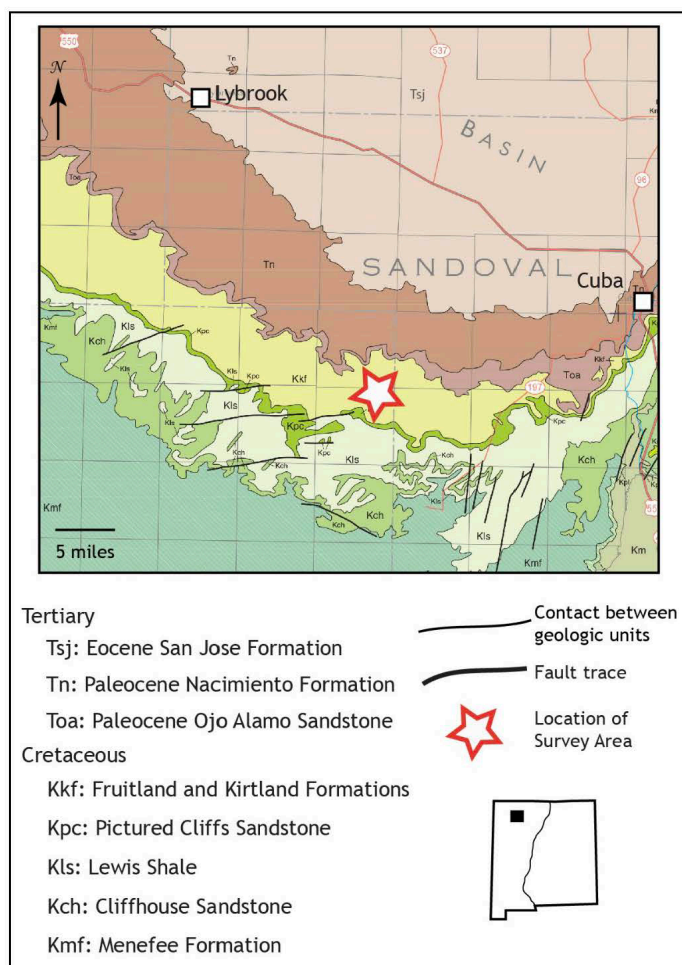


Figure 4. General geologic map of the southern San Juan Basin (Anderson and Jones, 2003).

The Fruitland-Kirtland Formations together represent deposition that began in deltaic, nearshore and estuarine environments before progressing to fluvial deposition (Bauer, 1916; Reeside, 1924; Baltz, 1967; Erpenbeck, 1979; Hunt, 1992; Hunt and Lucas, 1992). The Fruitland Formation is predominantly fine-grained extra channel deposits that locally include coal, carbonaceous shale, and dark gray mudstone and the coal-bearing units within the Fruitland Formation are among the largest coal reserves in New Mexico.

### **Background Paleontology**

The San Juan Basin is renowned not only for its extractive resources, but also for its long and storied history of producing a wide variety of fossil material, ranging from invertebrates to plants to dinosaur fossils, as well as some of the most critical early mammalian fossil material. The first fossils discovered in the Basin were found by E.D. Cope in 1874 at Arroyo Blanco and consisted of mammal, turtle, and crocodile remains, although Cope mentions scraps of dinosaur bone in 1885 (Simpson, 1981). The first dinosaurian material was collected by G.H. Pepper in 1902, and Barnum Brown subsequently undertook a collecting expedition in 1904 that resulted in a small collection of hadrosaur material (Simpson, 1981). From further expeditions and numerous critical discoveries, the Fruitland and Kirtland Formations are known for producing a wide variety of scientifically important fossil material including plants, invertebrates, microvertebrates and macrovertebrates (Simpson, 1981; Hunt and Lucas, 1992)

Of the two units, the Fruitland Formation has proven to be the most productive in terms of fossil material. Invertebrate faunas include bryozoans and crabs (Kues, 1983), gastropods, and a variety of both saltwater and brackish water-adapted pelecypods, and freshwater clams (Hunt and Lucas, 1992). Vertebrate fossil material pertains to a variety of fish, amphibians, reptiles, and early mammals (Clemens, 1973; Armstrong-Ziegler, 1978; Simpson, 1981; Sullivan, 1981; Hunt and Lucas, 1992, 1993). Dinosaur remains from the Fruitland Formation include fossil material from ornithomimids, dromaeosaurids, troodontids, tyrannosaurids, nodosaurids and ankylosaurids, pachycephalosaurids, hypsilodontosaurids, lambeosaurids, and hadrosaurids (Hunt and Lucas, 1993). Particularly famous dinosaur genera from the unit include the frilled dinosaur *Pentaceratops* (Lull, 1933; Rowe et al., 1981), the tyrannosaurid *Bistahieversor* (“the Bisti Beast”, Carr and Williamson, 2010) and the crested duckbill dinosaur *Parasaurolophus* (Wiman, 1931; Ostrom, 1961, 1963; Mateer, 1981).

### **Methods**

A preliminary desktop survey for the project area reviewed the Ojo Encino and Star Lake 1:24,000 scale geologic maps of the area (Scott et al., 1980a, b; Figure 5), which show expanses of the following map units in the project area (in ascending age order): Fruitland Formation (Kf),

Kirtland Formation (Kk), Picture Cliffs Sandstone (Kpc, Kpct), and the “Naha” alluvial unit (Qn). A review of the New Mexico Museum of Natural History and Science database did not return any known localities in or near the survey area. However, a review of the literature indicates that significant scientifically important fossil material has been discovered in the Fruitland Formation to the northwest and west. Pedestrian survey was conducted by traversing a 160-acre area encompassing all proposed drill sites in a non-linear manner such that both the proposed drill sites and a wide buffer area were visually inspected.

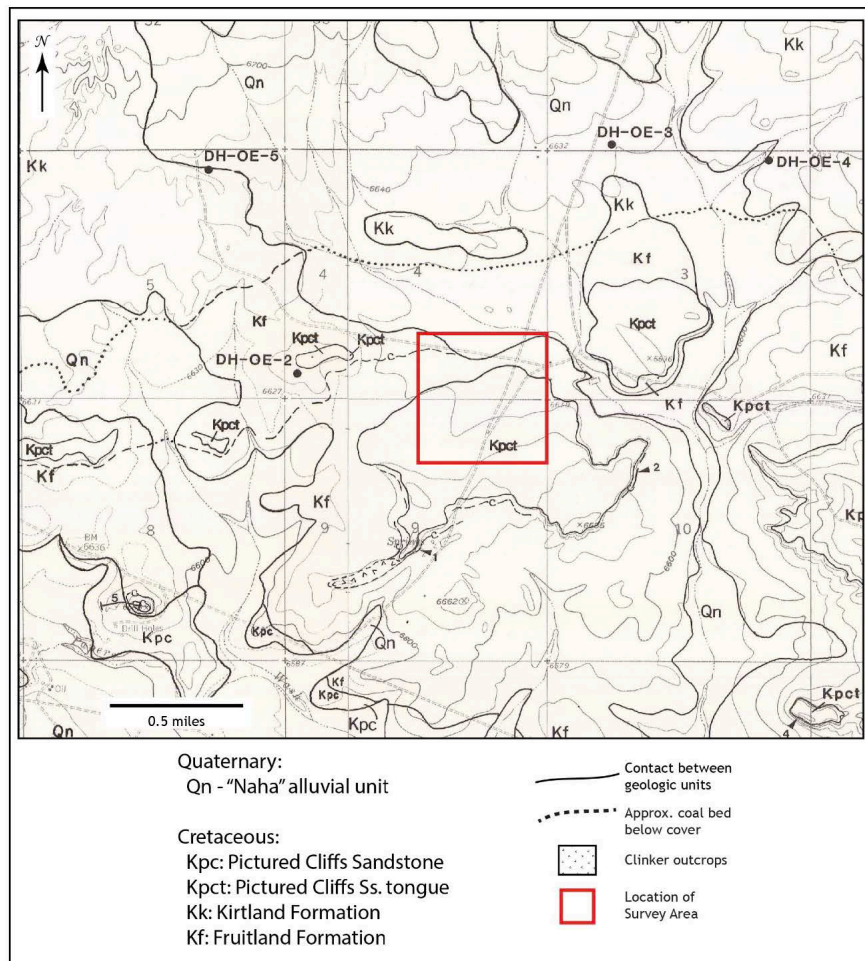


Figure 5. Geologic map of the project area, compiled from Scott et al. (1980a, b).

The BLM has developed a Potential Fossil Yield Classification (PFYC) system (2007, 2016) to evaluate the potential for significant fossil resources to be located in an area.

Occurrences of paleontological resources are closely tied to the geologic units (i.e., formations, members, or beds) that contain them. The probability for finding paleontological resources can be broadly predicted from the geologic units present at or near the surface. For that reason, geologic mapping can be used for assessing the potential for the occurrence of paleontological resources.

The PFYC system classifies geologic units based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils, and their sensitivity to adverse impacts. For this system, a higher class number (1-5) indicates a higher potential for significant fossil presence and/or adverse impact. This classification is applied to the geologic formation, member, or other distinguishable unit, preferably at the most detailed map level. The relative abundance of significant localities is intended to be the major determinant for the class assignment.

The PFYC system is meant to provide baseline guidance for predicting, assessing, and mitigating paleontological resources. The classification should be considered an intermediate point in the analysis and should be used to assist in determining the need for further mitigation assessment or actions. The following descriptions are taken from BLM IM 2016-124 (USDI BLM 2016):

**Class 1 – Very Low:** Geologic units that are not likely to contain recognizable paleontological resources. Units assigned to Class 1 typically have one or more of the following characteristics:

- Geologic units are igneous or metamorphic, (excluding air-fall and reworked volcanic ash units).
- Geologic Units are Precambrian in age.

**Class 2 – Low.** Geologic units unlikely to contain paleontological resources. Units assigned to Class 2 typically have one or more of the following characteristics:

- Field surveys have verified that significant paleontological resources are not present or are very rare.
- Units are generally younger than 10,000 years before present.
- Recent aeolian deposits.
- Sediments exhibit significant physical and chemical changes (i.e., diagenetic alteration) that make fossil preservation unlikely.

**Class 3 – Moderate.** Sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence. Units assigned to Class 3 have some of the following characteristics:

- Marine in origin with sporadic known occurrences of paleontological resources.
- Paleontological resources may occur intermittently, but abundance is known to be low.
- Units may contain significant paleontological resources, but these occurrences are widely scattered.
- The potential for an authorized land use to impact a significant paleontological resource is known to be low-to-moderate.

**Class 4 – High.** Geologic units that are known to contain a high occurrence of paleontological resources. Units assigned to Class 4 typically have the following characteristics:

- Significant paleontological resources have been documented but may vary in occurrence and predictability.
- Surface disturbing activities may adversely affect paleontological resources.
- Rare or uncommon fossils, including non-vertebrate (such as soft body preservation) or unusual plant fossils, may be present.
- Illegal collecting activities may impact some areas.

**Class 5 – Very High.** Highly fossiliferous geologic units that consistently and predictably produce significant paleontological resources. Units assigned to Class 5 have some or all of the following characteristics:

- Significant paleontological resources have been documented and occur consistently.
- Paleontological resources are highly susceptible to adverse impacts from surface disturbing activities.
- Unit is frequently the focus of illegal collecting activities.

**Class U – Unknown Potential.** Geologic units that cannot receive an informed PFYC assignment. Characteristics of Class U may include:

- Geological units may exhibit features or preservational conditions that suggest significant paleontological resources could be present, but little information about the actual paleontological resources of the unit or area is known.
- Geological units represented on a map are based on lithologic character or basis of origin but have not been studied in detail.



- Scientific literature does not exist or does not reveal the nature of paleontological resources.
- Reports of paleontological resources are anecdotal or have not been verified.
- Area or geologic unit is poorly or under-studied.
- BLM staff has not yet been able to assess the nature of the geologic unit.

The Scott et al. (1980a, b) maps show expansive areas of Fruitland and Kirtland Formation outcrops surrounding the project area. The discovery of numerous scientifically important fossil resources from the Fruitland Formation indicated that this area would be classified as PFYC 5.

### **Results of Pedestrian Survey**

On May 8, 2021 a professional paleontologist conducted pedestrian survey throughout the 160-acre proposed project area. Survey was focused more heavily on outcrops of Fruitland Formation in the northwest quarter of the project area. These outcrops consist of weathered coal (humate) overlain by a poorly exposed gray sandy mudstone (Figures 6 and 7). Local small gravel lags were observed in low spots among outcrops that include siliceous pebbles and small fragments of petrified wood. The remainder of the area is covered with moderately thick eolian sheetsand and small dunes anchored by abundant sagebrush (Figure 8). In the southwestern corner, localized exposures of fine to medium-grained buff colored sandstone suggest either a sandstone lens in the Kirtland Formation or a Pictured Cliffs Sandstone tongue in the immediate subsurface (Figure 9). In addition, the Star Lake Road and several smaller roads cut across the project area. No fossil material was observed during survey, but the abundance of scientifically important fossil material recovered from the Fruitland Formation elsewhere indicates a monitoring strategy should be employed, as well as an unanticipated discoveries plan (UDP) and worker training. We recommend routine monthly or every other month spot-monitoring, with the option to increase the frequency of monitoring should scientifically important fossil material be observed within the mining area.



**Figure 6. Low mounds of humate in the northwestern corner of the survey area. View to the northwest.  
Photograph taken at 35° 54' 2.6" N, 107° 22' 15.2" W.**



**Figure 7. Low outcrop of gray mudstone with gravel lag on deflationary surfaces. View to the east.  
Photograph taken at 35° 54' 1.1" N, 107° 22' 3.1" W.**



**Figure 8.** Eolian sheetsand with sagebrush that covers much of the eastern and southern survey area. View to the southeast. Photograph taken at 35° 54' 4.0" N, 107° 21' 45.3" W.



**Figure 9.** Thin-bedded fine to medium-grained sandstone locally exposed in the southwestern corner of the survey area. View to the northeast. Photograph taken at 35° 53' 44.7" N, 107° 21' 57.7" W.

### References Cited

- Anderson, O.J. and Jones, G.E., 2003, New Mexico Geologic Highway Map: New Mexico Geological Society and New Mexico Bureau of Geology and Mineral Resources Open-File Report 408, scale 1:1,000,000.
- Armstrong-Ziegler, J.G., 1978, An aniliid snake and associated vertebrates from the Campanian of New Mexico: *Journal of Paleontology*, v. 52, p. 480-483.
- Baltz, E.G., 1967, Stratigraphy and regional tectonic implications of part of Upper Cretaceous and Tertiary rocks, east-central San Juan Basin, New Mexico: U.S. Geological Survey Professional Paper 552, 110 p.
- Bauer, C.M., 1916, Contributions to the geology and paleontology of San Juan County, New Mexico, Part I: Stratigraphy of a part of the Chaco River Valley: U.S. Geological Survey Professional Paper 98P, p. 271-278.
- Bureau of Land Management, 2007. Instruction Memorandum: Potential Fossil Yield Classifications (PFYC) System for Paleontological Resources on Public Lands, 12 p.
- Bureau of Land Management, 2016, Potential Fossil Yield Classification (PFYC) System for Paleontological Resources on Public Lands, Instructional Memorandum No. 2016-124.
- Carr, T.D. and Williamson, T.E., 2010, *Bistahieversor sealeyi*, gen. et sp. nov., a new tyrannosauroid from New Mexico and the origin of deep snouts in Tyrannosauroida: *Journal of Vertebrate Paleontology*, v. 30, p. 1-16.
- Cather, S.M., 2004, Laramide orogeny in central and northern New Mexico and southern Colorado: in Mack, G.H. and Giles, K.A., eds., *The Geology of New Mexico: A Geologic History*, p. 203-248.
- Clemens, W.A., 1973, The role of fossil vertebrates in interpretation of Late Cretaceous stratigraphy of the San Juan Basin, New Mexico: *Four Corners Geological Society Memoir*, p. 154-167.
- Erpenbeck, M.F., 1979, Stratigraphic relationship and depositional environments of the Upper Cretaceous Pictured Cliffs Sandstone and Fruitland Formation in the southwestern San Juan Basin, New Mexico [M.S. thesis]: Lubbock, Texas Tech University, 78 p.
- Hunt, A.P., 1992, Sedimentology of a fossiliferous fluvial system, Fruitland and Kirtland Formations (Late Cretaceous), Fossil Forest Area, San Juan County, New Mexico: *New Mexico Geological Society Guidebook 43*, p. 47-50.

- Hunt, A.P. and Lucas, S.G., 1992, Stratigraphy, paleontology and age of the Fruitland and Kirtland Formations (Upper Cretaceous), San Juan Basin, New Mexico: New Mexico Geological Society Guidebook 43, p. 217-239.
- Hunt, A.P. and Lucas, S.G., 1993, Cretaceous vertebrates of New Mexico: New Mexico Museum of Natural History Bulletin 2, p. 77-91.
- Kues, B.S., 1983, Bryozoan and crustacean remains from Fruitland Formation (Upper Cretaceous) of New Mexico: New Mexico Geology, v. 50 p. 52-55, 68.
- Lull, R.S., 1933, A revision of the Ceratopsia or horned dinosaurs: Peabody Museum of Natural History Memoir 3, 175 p.
- Mateer, N.J., 1981, The reptilian megafauna from the Kirtland Shale (Late Cretaceous) of the San Juan Basin, New Mexico: *in* S.G. Lucas, J.K. Rigby, Jr., and B.S. Kues (eds.), *Advances in San Juan Basin Paleontology*, p. 49-75.
- Ostrom, J.H., 1961, A new species of hadrosaurian dinosaur from the Cretaceous of New Mexico: *Journal of Paleontology*, v. 35, p. 575-577.
- Ostrom, J.H., 1963, *Parasaurolophus cyrtocristatus*, a crested hadrosaurian dinosaur from New Mexico: *Fieldiana: Geology*, v. 14, p. 143-168.
- Pazzaglia, F.J. and Hawley, J.W., 2004, Neogene (rift flank) and Quaternary geology and geomorphology: *in* G.H. Mack and K.A. Giles (eds.), *The Geology of New Mexico, A Geologic History*, p. 407-437.
- Reeside, J.B., Jr., 1924, Upper Cretaceous and Tertiary formations of the western part of the San Juan basin of Colorado and New Mexico: U.S. Geological Survey Professional Paper 134, 70 p.
- Rowe, T., Colbert, E.H., and Nations, J.D., 1981, The occurrence of *Pentaceratops* (Ornithischia: Ceratopsia) with a description of its frill: *in* S.G. Lucas, J.K. Rigby, Jr., and B.S. Kues (eds.), *Advances in San Juan Basin Paleontology*, p. 29-48.
- Scott, G.R., Schneider, G.B. and Mytton, J.W., 1980a, Geologic map of the Ojo Encino Mesa quadrangle, McKinley and Sandoval Counties, New Mexico: U.S. Geological Survey Miscellaneous Field Studies Map MF-1249, scale 1:24,000.
- Scott, G.R., Mytton, J.W. and Schneider, G.B., 1980b, Geologic map of the Star Lake quadrangle, McKinley County, New Mexico: U.S. Geological Survey Miscellaneous Field Studies Map MF-1248, scale 1:24,000.

- Simpson, G.G., 1981, History of vertebrate paleontology in the San Juan Basin: *in* S.G. Lucas, J.K. Rigby, Jr., and B.S. Kues (eds.), *Advances in San Juan Basin Paleontology*, p. 3-25.
- Sullivan, R.M., 1981, Fossil lizards from the San Juan Basin, New Mexico: *in* S.G. Lucas, J.K. Rigby, Jr., and B.S. Kues (eds.), *Advances in San Juan Basin Paleontology*, p. 76-88.
- Wiman, C., 1931, *Parasaurolophus tubicen* n. sp. aus der Kreide in New Mexico: *Acta Regiae Societatis Scientiarum Upsaliensis*, series 4, v. 7, p. 1-34.

# Appendix G – NEPA ID 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:** Menefee Mining Corporation Black Springs Humate Mine Expansion

**NEPA Number:** IT4RM-F010-2023-0061-EA; DOI-BLM-NM-F010-2023-0068-EA

**File/Serial Number:**

**Project Leader:** 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 <sup>1</sup>	Initials <sup>2</sup>	Date <sup>2</sup>
<b>RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)</b>					
PI	Air Quality	(x) W. Thomas ( ) J. Tafoya	How would emissions generated by equipment associated with the proposed project impact air quality?	WT	6/20/2023
NI	Greenhouse Gas Emissions	(x) W. Thomas ( ) J. Tafoya	Development of the proposed project would not impact GHGs to a degree that would require detailed analyses, however there are emissions associated with, construction and operating the humate mine. Therefore, the minimal emissions should be disclosed in the Analyzed in Brief (AIB) section.	WT	6/20/2023
NI	Cultural Resources	( ) K. Adams ( ) E. Simpson ( ) C. Lowry (x) M. Williams	A Class III Archaeological Survey (De Cunzo 2021) was conducted for the proposed project. Five previously recorded archaeological sites (LA 34765, LA 34767, LA 169207, LA 169208, and LA 169751); one newly recorded archaeological site (LA199130); and seven isolated manifestations (IMs) were documented and evaluated within the APE. Of the sites, LA 169207 and LA 199130 are recommended as undetermined for their eligibility to the National Register of Historic Places (NRHP) and would require more research or test excavations to determine their status. The remaining four sites (LA 34765, LA 34767, LA 169208, and LA 169752) are recommended as eligible to the NRHP under criterion D.  It is recommended that all ground disturbing activity avoid the NRHP-eligible and undetermined sites by a minimum of 50 feet (15 meters) with the use of temporary fencing and archaeological monitoring (as necessary). Assuming these management recommendations are followed, the undertaking should have no effect on historic properties or potential historic properties.	MW	9/21/2023

## INTERDISCIPLINARY (ID) TEAM CHECKLIST

*Farmington Field Office*

Determination	Resource	Assigned Specialist (X)	Rationale for Determination <sup>1</sup>	Initials <sup>2</sup>	Date <sup>3</sup>
NI	Native American Religious and other Concerns	( ) K. Adams ( ) E. Simpson ( ) C. Lowry (x) M. Williams	In response to the Section 106 consultation letter, a consultation request was received by the BLM from the NNHHPD. Through conversations with Tim Begay of the NNHHPD, a known, named TCP was identified as potentially being in the vicinity of the APE. In response, Erik Simpson, BLM FFO archaeologist, went to the local Navajo communities and conducted ethnographic interviews with elders to determine if they knew of this TCP. Based on the results of the interviews it appears that the TCP's location in the NNHHPD records is in error and the TCP is not located near the proposed project (personal communication Erik Simpson 2024). After reviewing the survey report and based on the additional ethnographic fieldwork, BLM FFO archaeologists determined there would be no impact on sensitive cultural resources. The Hopi Tribe requested copies of the Class III archaeological survey were received on October 28, 2019. The survey copies were provided, and no further information was requested. No other responses were received as of the decision date.	MW	9/21/2023
NI	Paleontology	(x) C. Wenman	The proposed project was surveyed for paleontological resources. No resources of concern were identified.	CW	5/23/2023
NI	Areas of Critical Environmental Concern	(x) W. Thomas	There are no ACECs present with in the proposed project area.	WT	6/20/2023
NP	Lands with Wilderness Characteristics	(x) S. Allison ( ) D. McKim	Proposed project is not in proximity to any of the three parcels determined to be eligible for LWC during the 2016 LWC Inventory.	SA	05/23/2023
NP	Wilderness	(x) S. Allison ( ) D. McKim	Proposed project is not in proximity to either the Bisti/De-Na-Zin or Ah-shi-sle-pah Wilderness areas.	SA	05/23/2023
NI	Visual Resources	(x) S. Allison ( ) D. McKim	Proposed project meets the goals of VRM Class IV.	SA	05/23/2023
NI	Recreation	(x) D. McKim ( ) S. Allison	No impact to recreation.	DM	05/22/2023
NP	Fuels/Fire Management	(x) J. Quintana	No impacts to fire and fuels management.	JQ	05/23/2023
NP	Geology	(x) C. Wenman	No geologic resources exist in the project area.	CW	5/22/2023
NI	Solid Mineral Resources	(x) C. Wenman	The project would allow for disposal of solid mineral resources (humate) in the project area.	CW	5/22/2023
NI	Oil and Gas / Energy Production	(x) C. Wenman	No active leases exist in the project area.	CW	5/22/2023
NP	Lands/Access	(x) M. Tilden ( ) V. Barber ( ) M. Brown	There are no existing ROWs within the proposed expansion project area.	MT	5/23/2023
NI	Wastes (hazardous or solid)	(x) C. Wenman	The proposed project would not create hazardous or solid wastes.	CW	5/22/2023
NI	Livestock Grazing	( ) B. Witmore (x) C. Gould ( ) N. Craun ( ) J. Tafoya	Proposed project is located within the Navajo Nation (BIA) managed grazing, Star Lake Community Allotment.	CG	5/22/2023
NI	Public Land Health Standards	( ) B. Witmore (x) C. Gould ( ) N. Craun	Proposed project is located within the Navajo Nation (BIA) managed grazing, Star Lake Community Allotment.	CG	5/22/2023



## INTERDISCIPLINARY (ID) TEAM CHECKLIST

*Farmington Field Office*

Determination	Resource	Assigned Specialist (X)	Rationale for Determination <sup>1</sup>	Initials <sup>2</sup>	Date <sup>2</sup>
		( ) J. Tafoya			
NI	Invasive Species/ Noxious Weeds	( ) B. Witmore (x) C. Gould	Standard noxious and invasive weed stipulations should be applied to the project. Basic language has been included in the proposed COA's that will address some of the potential issues. Project lead should include more detailed COA's in order to provide clear guidance on responsibilities of operator for weed control.	CG	5/22/2023
NI	Vegetation Excluding USFWS Designated Species	( ) B. Witmore (X) C. Gould ( ) N. Craun ( ) J. Tafoya	The proposed action is not expected to impact Vegetation excluding USFWS Designated Species within the PPA.	CG	5/22/2023
NI	Special Status Plant Species and Animal Species	(X) J. Kendall ( ) R. McBee	Biological survey did not find any SSS or occupied habitat within PPA	JK	5/25/23
NI	Threatened, Endangered or Candidate Plant and Animal Species	(X) J. Kendall ( ) R. McBee	Within conformance to 2003 RMP/2002BA	JK	5/25/23
NI	Migratory Birds	(X) J. Kendall ( ) R. McBee	Low quality nesting habitat	JK	5/25/23
NI	Wildlife	(X) R. McBee ( ) J. Kendall	Proposed project is not anticipated to have significant impact on small or big game species.	RM	5/22/23
NP	Wildlife-aquatic	(X) R. McBee ( ) J. Kendall	No aquatic wildlife present in proposed project area.	RM	5/22/23
NP	Wetlands/Riparian Zones	(X) J. Kendall	No riparian/wetlands within PPA	JK	5/25/23
NI	Water Resources/Quality (drinking/surface/ground)	(X) W. Thomas	Development of the proposed project would not impact water quantity, to a degree that would require detailed analyses, however there are emissions associated with, construction and operating the humate mine. Therefore, the minimal water quantity should be disclosed in the Analyzed in Brief (AIB) section.	WT	6/20/2023
NI	Soils	(X) W. Thomas	There are no fragile soils within the proposed project area.	WT	6/20/2023
NP	Wild Horses and Burros	( ) B. Witmore ( ) C. Gould ( ) N. Craun (x) R. Culp	No Congressionally designated wild horses or burros in the project area	RC	5/22/2023
NI	Socio-Economics	(X) W. Thomas	The proposed project will not impact socio-economics of the region.	WT	6/20/2023
NI	Environmental Justice	(X) W. Thomas	The proposed project will not impact environmental justice communities of the region.	WT	6/20/2023

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

<sup>2</sup> 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