NEW MEXICO

Abandoned Mine Lands

Project Manual
Including Plans and Specifications
for Construction of

YANKEE CANYON COUNTY ROAD A-25 SUBSIDENCE MITIGATION PROJECT

Colfax County, New Mexico

PROJECT NO.
EMNRD-MMD-2025-04

AUTHORIZED BY:

ABANDONED MINE LAND PROGRAM
MINING and MINERALS DIVISION
STATE OF NEW MEXICO, ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT*
(with reclamation fees paid by the New Mexico Coal Industry)

June 2025

CERTIFICATION PAGE

PROJECT NAME: **YANKEE CANYON COUNTY ROAD A-25 SUBSIDENCE MITIGATION PROJECT**

LOCATION: **COLFAX COUNTY**

PROJECT NUMBER: **EMNRD-MMD-2025-04**

AML PROJECT ENGINEER: **BRADEN BELLIVEAU**
Mining and Minerals Division
State of New Mexico, Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive Santa Fe, New Mexico 87505
Telephone 505.479.2698

The technical material and data contained in the specifications were prepared under the supervision and direction of the undersigned, whose seal as a Professional Engineer (P.E.), licensed to practice in the State of New Mexico, is affixed below.

Cameron J. Twing, P.E.	18526 License No.
Authorized Representative/Title Energy, Minerals and Natural Resources Department	Date

Michelle Lujan Grisham, Governor

All questions about the meaning or intent of these documents shall be submitted only to the General Services Department, State Purchasing Division Procurement Specialist, in writing.

TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

I. TABLES

The following tables are referenced in the text:

II. ATTACHMENTS

Attachment 1: Design Drawings

The following sheets are included within the design drawings:

END OF TABLE OF CONTENTS

SPECIFICATIONS

Please Note – Use of Brand Name or equal Specifications: Use of any brand name herein is for the purpose of describing the standard of quality, performance, and characteristics desired and is not intended to limit or restrict competition.

DIVISION 1 – GENERAL REQUIREMENTS

SPECIFICATIONS

The following sections describe the general requirements of this project. References to Sheet Numbers, refer to the design drawings, which are included in this Project Manual.

01010 – SUMMARY OF WORK

The Yankee Canyon County Road A-25 Subsidence Mitigation Project is located approximately 9 miles northeast of Raton in Colfax County, New Mexico. There are several small subsidence features found in the travelled way of County Road A-25 (A-25) and three known abandoned mine adits near A-25 (Sheet 3 and 4). The project area is undermined by the Turner-Urtado Mine and the Denton Mine. The Turner-Urtado Mine shows a portion of the mine workings below the subsidence features along A-25, and the Denton Mine workings explored through a known abandoned mine adit undermine A-25 (Sheet 3). A-25 is an unpaved road with steep grades and switchbacks. The road surface is exposed bedrock in some locations, and dirt with a gravel overlay in others. The site is steeply sloped and rocky with dense stands of scrub-oak, making access to areas adjacent to A-25 difficult. The project area (Sheet 2) is partially on private land and partially on State of New Mexico land.

This project involves drilling and grouting in underground voids to prevent further subsidence of A-25; and surface restoration and re-seeding of disturbed areas. The project will include the following work:

- There are four subsidence features within the travelled way of A-25 suggesting that the road alignment has mine related voids underneath. Closure of the subsidence features and providing additional support to A-25 will include:
    - Construct Support Pillars in Mine Workings: Establish support pillars in the encountered mine workings using forty-two (42) drilled boreholes, with a spacing of 10 to 20 feet, on center, near the subsidence features and approximate known mine workings, and 30 feet, on center, along the remaining road segments. Drilling will occur along approximately 810 feet of the A-25 road alignment to support the partially collapsed underground mine workings, at approximate depths ranging from 20 to 100 feet below the ground surface. Proposed drill hole locations are shown on Sheets 4 and 5. The goal of the drilling and grouting work is to address the A-25 subsidence features, map voids under the road alignment, and to support those voids with grout pillars to stop additional subsidence and stabilize the road.

- The amount of drilled boreholes that are expected to encounter rubble or void space due to the room and pillar design of the mine is unknown at this time due to uncertainty about the exact position and orientation of the mine workings. Boreholes that do not encounter rubble or void space will not require casing or support grout. Approximately 3,000 linear feet of drilling is expected, and approximately 1,400 linear feet of casing will be required for this task. It is estimated that the volume of grout to construct the pillars will be approximately 460 cubic yards (CY) (355 CY + 30% contingency).

- Boreholes shall be drilled through the mine workings horizon (as determined by the Engineer at each bore hole location) and five feet into the floor below the workings. Casing shall initially be set three feet above the mine floor of each hole (as determined by the Engineer) for the initial grout stage. Each grouting stage is considered complete after reaching the pressure cut off, volume cut off, other listed cut off condition, or if determined complete by the Engineer. After grouting the initial stage, the casing will be pulled up three feet for each successive stage; grout stages shall continue to a point when the casing is at least five feet above the mine workings or rubble. When a hole has met the criteria for the completion of grouting, the casing shall be removed, gravity fed grout will be used to backfill the hole to the appropriate depth from surface, and imported base course material shall be used to fill the remaining hole space to restore the hole to appropriate surface conditions. Surface restorations cover the surface expression of the drill hole and are not meant to address A-25 as a whole. The Contractor shall note that timbers were used to support the mine workings and that pieces of wood may be recovered during drilling. The Contractor shall expect to encounter timbers in various states of degradation. Grouting shall be within the limits indicated on the project plans to meet the acceptance criteria presented in Section 03020 of these Specifications.

- The bore holes and support pillars will be constructed as shown on Sheet 6.

- The Contractor will hand seed and mulch disturbed areas and staging areas. The A-25 road surface, including staging areas on the road surface, will not be seeded and mulched. In total 0.25 acres are expected to be seeded and mulched. A mix of native seeds will be used for reseeding, and a local woody mulch that is weed-free certified will be used to stabilize the ground surface.

Table I, below, summarizes the scope of the project and includes the estimated amount of material needed to make the improvement.

Demobilization shall be conducted in such a manner to ensure that the Contractor leaves all project areas in as good or better condition than before disturbance. All trash, refuse, and waste shall be removed from the project site and disposed of accordingly, including drill cuttings and excess materials from drilling and grouting operations. All disturbed areas including the A-25 road surface shall be restored to pre-construction condition as determined by the Project Engineer.

TABLE I
PROJECT SUMMARY INCLUDING MINE FILL VOLUME ESTIMATES

The mine fill volume estimates are provided only for the information of the Potential Bidder. The Abandoned Mine Land Program makes absolutely no guarantee of their accuracy or precision. Volume estimates are of the material that may be required to create grout pillars within mine cavities and adjacent areas as indicated, including an allowance for shrinkage and irregularities.

To comply with wildlife restrictions, construction is limited to certain periods of the year. Should construction activities take place during the **migratory bird nesting season (March 1 – July 1)**, a pre-construction nesting bird survey will be completed by the AML Program or representatives of the AML Program to locate any active nest that would need to be avoided. This survey should be conducted no more than 10 days prior to the start of construction. If occupied nests are found, they must be avoided until the young have fledged to comply with the requirements of the MBTA.

AML FEATURE NUMBER	TYPE OF MINE FEATURE	APPRX. DIMENSIONS (FEET)	QNTY / VOLUME	WORK REQUIRED / COMMENTS
Subsidence Areas and the A-25 Road Alignment	Subsidence Features and Underground Mine Workings	See Drawing Sheet 3	210 Lin ft	Alluvial drilling operations.
			2,730 Lin ft	Rotary drilling operations.
			460 YD^3	Grouting operations to inject support grout.
Site-wide	Not Applicable		¼ Acre	Application of mulch and seed mix on disturbed areas adjacent to roadway and staging areas..

01011 – SUMMARY OF PROJECT AND CONSTRUCTION ACCESS

The project site consists of subsidence due to historic underground mining along Colfax County Road A-25. During investigation of the subsidence features, 3 dangerous open mine adits were also discovered. Project activities and the methods and time restrictions for mitigation are summarized in Table I.

To the maximum extent practicable, construction access is limited to County Road A-25 except as otherwise shown, specified, or allowed by the Engineer.

The Contractor shall be responsible for thoroughly investigating site conditions and scheduling their equipment, equipment operations, personnel, and safety procedures to prevent accidents and injuries.

01012 – AVOIDANCE AREAS FOR PRESERVATION OF CULTURAL AND BIOLOGICAL RESOURCES

The Contractor shall avoid designated cultural and biological resources. The Contractor shall avoid any activities outside of the designated areas of disturbance. Additionally, existing mine features and interpretive displays shall not be removed or damaged as a result of the work. No construction disturbances (including excavation, fill and stockpiling of construction materials) or moving of artifacts shall take place unless directly specified in design documents. The Project Manager or Project Engineer may designate special avoidance areas.

Wherever the Contractor is working with equipment near designated avoidance features and avoidance areas and wherever construction access routes pass next to these features, the Contractor shall place four-foot high, temporary, high-visibility barrier fencing (Hi-Vis, ADPI, or equivalent) around the features. The Contractor shall provide a submittal for the barrier fencing to be used prior to installation. Barrier fencing shall be removed upon completion of work.

The Contractor shall bear all direct, indirect, and consequential costs of repairs due to unauthorized damage caused by the Contractor's operations to cultural and biological resources to be avoided. These costs shall include but are not limited to fees and charges of engineers, attorneys, and other professionals, made necessary thereby.

The Contractor shall cooperate fully to preserve archaeological and historic artifacts and any threatened or endangered species found within the project area. If the Contractor encounters a previously uninventoried archaeological site, historic site, or species listed as or proposed to be listed as threatened or endangered, the Contractor shall terminate all further operation in that immediate area until the archaeological or biological preservation agencies have had the opportunity to survey the site. This termination shall not preclude continuation of work in other areas nor shall it entitle the Contractor to additional payment in any form, other than an extension of time, unless the Contractor is substantially precluded from working on the entire project.

If construction occurs within the migratory bird nesting season (March 1 to July 1), a preconstruction migratory bird survey will be required. If needed, the AML Program will contract an outside consulting firm to perform the bird survey within 10 days to the start of construction. The Contractor shall contact the AML Program Project Engineer at least one month prior to commencement of construction to coordinate this survey or three weeks prior to Notice to Proceed. Failure by the Contractor to timely coordinate a preconstruction migratory bird survey may impact the Contractor's schedule and no additional time or compensation will be granted. Following receipt of NTP, the Contractor shall be responsible for maintaining nest free conditions in construction-impacted areas. The Contractor shall comply with the requirements of the Migratory Bird Treaty Act (MBTA), the United States Fish and Wildlife Service (USFWS), and shall not cause harm or harassment to migratory birds.

If occupied nests are found, the AML Program will coordinate with the New Mexico Game and Fish Department and USFWS to determine the appropriate exclusion buffer. This exclusion buffer will remain until after the juvenile birds have fledged (flown from the nest).

01013 – Unmarked Human Burials

If unmarked human burials are discovered during ground disturbing activities on state or private land, work will stop. The remains will be protected from further disturbance and AMLP will notify the local law enforcement agency, the Office of the Medical Investigator (OMI), the state land managing agency, and State Historic Preservation Officer (SHPO). If the OMI determines that the remains are without medico-legal significance, the OMI will terminate jurisdiction and SHPO, in consultation with AMLP and the state land managing agency, will determine the steps to be taken to protect or remove the remains in accordance with the Cultural Properties Act §18-6-11.2, NMSA 1978 and implementing rule 4.10.11 NMAC.

AMLP will consult with Tribes that may attach religious and cultural significance to human remains, graves or associated funerary objects. This consultation will be coordinated with SHPO and may be conducted concurrently with SHPO notification to the tribes pursuant to 4.10.11 NMAC.

If unmarked human burials are discovered on federal land, work will stop, and the remains will be protected from further disturbance. AMLP will contact the federal land managing agency(s) and SHPO. The federal land managing agency(s) will comply with 25 USC 3002 (d) of the Native American Graves Protection and Repatriation Act (NAGPRA) and implementing regulations at 43 CFR § 10.

01015 – Contractor's Use of the Premises

The Contractor shall take reasonable measures to avoid traffic conflicts between vehicles of the Contractor's employees and private citizens and to avoid overloading of any driveways, roads and streets. The Contractor shall limit the access of equipment and trucks to the project site and provide protection for any improvements over which trucks and equipment must pass to reach the job site. If heavy equipment operated on wet or soft roads causes excessive rutting, the damage shall be repaired by grading the road upon completion of the work or as necessary to facilitate the access of concrete trucks or as necessary throughout the project to maintain contractor and public access to the site, as directed by the project engineer.

01025 – Measurement and Payment

The measurement for payment is as defined below. Payment shall be made based on the applicable unit or lump sum price bid therefor in the Bid Form. The estimated quantities of materials and work required to complete the project are approximations only and are given as a basis for calculation upon which the contract award will be determined. All estimated quantities could vary considerably and will depend on the actual conditions encountered at the time the work is performed. AML reserves the right to decrease or increase any or all of the quantities of materials or work as may be deemed necessary during the project.

01027 – APPLICATIONS FOR PAYMENT

All Applications for Payment for work performed under this contract shall whenever practicable, first be reviewed by the Project Manager before being submitted to:

Braden Belliveau
Mining and Minerals Division
Energy, Minerals, and Natural Resources Department
State of New Mexico
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

All Applications for Payment shall include appropriate backup, such as daily reports, load counts, etc. Contract amount equals total base bid plus gross receipts tax.

01028 – PRICES

The following subsections describe the lump sum and unit prices to be paid under this contract.

Lump Sum Prices

The basis of payment of lump sum prices as outlined in the Bid Form is as follows:

A. Mobilization and Demobilization

Payment for Mobilization and Demobilization are included as one lump sum, and will be made at the lump sum prices bid therefor in the Bid Form but shall not exceed 10% of the total base bid. It is the intent of this specification to provide for the Contractor to receive 100% of the mobilization/demobilization bid item by the time the Contractor has completed ten percent of the total original contract amount less mobilization/demobilization. Total original contract amount less mobilization/demobilization shall mean the total amount bid as compensation for the contract, excluding gross receipts tax, less the amount bid for mobilization/demobilization. For lesser amounts of work completed (less than 10%), the Contractor shall receive a prorated portion of the mobilization/demobilization.

In addition, payment for mobilization/demobilization will not be made until the Project Engineer's approval of an adequate performance. An "adequate performance" will be satisfied when the Contractor has shown the ability to successfully perform the required tasks of this project as outlined in these Specifications to the satisfaction of the Project Engineer. In case of any weather delays, compensation for additional mobilization/demobilization will not be made.

Payment for mobilization/demobilization shall include all equipment, fees, fuel, insurance, labor, permits, personnel, supervision and transportation to assemble, drive, operate, place, position, provide security measures for, and transport equipment, field offices, fuel, implements, machinery, materials, temporary sanitary facilities, and support facilities to and at the job site in

conformance with the Project Manager's directives and these Specifications. This amount shall include complete mobilization/demobilization no matter how often equipment is transported to individual sites within the project area.

Mobilization/demobilization shall also include preparation of an Occupational Safety and Health Administration (OSHA) compliant Health and Safety Plan (HASP) detailing the site-specific hazards and safety precautions associated with site work. The HASP shall include a list of responsible persons, hazard identification, hazard controls and safe practices, emergency and accident response, employee training requirements, chemical safety data sheets (SDS), and communication information and procedures.

Mobilization/demobilization shall also include providing materials for animal exclusion as defined in the beginning of Division 2 – Sitework.

Mobilization/demobilization shall also include preparation of any other required pre-construction submittals as specified in this manual.

Unit Rate Prices.

A. Drilling Operations

Payment for alluvial and rotary drilling will be made at the respective linear foot price shown in the Bid Form. This price shall include all work necessary to complete drilling operations in accordance with the drawings and specifications. This work shall include the tasks necessary to setup on a bore hole location; case the upper portion of a hole to prevent any unconsolidated materials present from sloughing into the hole (alluvial drilling only); provide incremental cuttings samples; drill to the necessary depths for each hole (rotary drilling only); and includes all equipment, labor, material, and supervision costs necessary to complete construction.

B. Grout Injection Pipe

Payment for work associated with the grout injection pipe shall be made at the linear foot price shown in the Bid Form. This price shall include all work necessary to complete the installation and removal of grout injection pipe in accordance with the drawings and specifications. This work shall include the tasks necessary to install the grout injection pipe; ensure the pipe is clear of any obstructions; remove the injection pipe after grout injection is completed; wash out the injection pipe to ensure no grout is allowed to build up on the equipment; and includes all equipment, labor, material, and supervision costs necessary to complete construction.

C. Pump Set Up

Payment for pump set ups shall be made per feature at the price shown in the Bid Form. This price shall include all work necessary to set up for grout injection on each hole in accordance with the drawings and specifications. This work shall include the tasks necessary to move all necessary equipment to the new location; set the casing to the appropriate first stage depth; set up

all grout flow monitoring equipment; set up all ground level monitoring equipment; and includes all equipment, labor, material, and supervision costs necessary to complete construction.

D. Backfill and Surface Restorations

Payment for backfill and surface restoration work shall be made per feature at the price shown in the Bid Form. This price shall include all work necessary to backfill and restore the surface conditions of a completed hole in accordance with the drawings and specifications. This work shall include the tasks necessary to gravity feed backfill grout into the open, completed holes to the appropriate depth; fill and compact the remaining hole space with base course material; and includes all equipment, labor, material, and supervision costs necessary to complete construction.

E. Pillar Support Grout

Payment for pillar support grout work shall be made per cubic yard of grout injected at the price shown in the Bid Form. This price shall include all work necessary to inject support grout in accordance with the drawings and specifications. This work shall include the tasks necessary to inject grout at the appropriate depths and pressures; monitor pressure, pumping rates, and the volume of grout injected; flush and waste water runoff controls; monitor for ground movement; complete all necessary grout material testing; and includes all equipment, labor, material, and supervision costs necessary to complete construction.

F. Hand Seeding and Mulching

The unit of measurement for payment for seeding will be per square foot, as measured in the field, parallel to the seeded surface using methods acceptable to the Engineer. Payment for seeding will be made at the unit price of the Contractor's bid on the Bid Form multiplied by the number of units installed. This price shall include soil preparation; raking topdressing; incorporating specified soil amendments; mulch; seeding by broadcasting; and includes all equipment, labor, material and supervision costs necessary to complete installation, of all areas disturbed by construction activities.

Any surface disturbance areas of the project not on the A-25 road surface must be seeded/revegetated. Disturbed areas may include but are not limited to: areas used for office (as necessary) and sanitation units; equipment parking; stockpile and storage areas; and service areas.

G. Road Repairs

Payment for road repairs shall be made per instance of improvement to address damage from heavy traffic. Road repairs shall be made to county road A-25 when requested by the Engineer based on existing damage from heavy construction traffic and the remaining construction needs. Payment for road repairs will be made at the unit price of the Contractor's bid on the Bid Form multiplied by the number of rounds of road repairs required. This price shall include surface prep, road base material, compaction, and includes all equipment, labor, material and supervision costs necessary to complete the required road repairs.

01030 – ALTERNATES

Whenever equipment or materials are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular supplier, the naming of the item is intended to establish the type, function, and quality required. Unless the name is followed by words indicating that no substitution is permitted, the Project Engineer may accept equipment or materials of other suppliers if the Contractor submits sufficient information to allow for adequate determination that the equipment or materials proposed are equivalent or equal to that named.

01035 – MODIFICATION PROCEDURES

The following section describes procedures for making modifications to the contract by change orders. Modifications may involve changes in contract sum, contract time, and scope.

01036 – CHANGE ORDER PROCEDURES

The Contractor shall submit a request for any changes in the work under this contract, in writing, to the Project Engineer. No changes in work or quantities shown shall be authorized until a properly executed Change Order has been issued by MMD. Any work performed outside the original quantities or scope of work, before the issuance of a properly executed Change Order, shall be at the Contractor's risk.

The Contract Time may only be changed by a Change Order. Any claim for an extension in the Contract Time shall be based on written notice delivered to the Project Engineer within fifteen working days of the occurrence of the event causing the claim. The extent of the claim with supporting data shall be included unless the Project Engineer allows additional time to ascertain more accurate data. The Project Engineer shall determine all claims for adjustment in the Contract Time. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order. The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of the Contractor if a claim is made therefore as provided above. Such delays shall include, but may not be restricted to, acts or neglect beyond the Contractor's control, epidemics, fires, floods, labor disputes, abnormal weather conditions, or acts of nature. In the event delays in construction occur due to weather, the conditions as outlined above will be in effect. If the Contractor leaves the project area due to a weather delay, the Contractor shall be responsible for assuring that all areas are left in a clean and safe condition as approved and directed by the Project Manager. In case of any weather delays, compensation for additional Mobilization or Demobilization will not be made.

01040 – COORDINATION

The following sections define the parties responsible for coordination of the contract work at the project and job site levels.

01041 - PROJECT COORDINATION

The Project Engineer will send the Contractor Notices to Proceed, Change Orders, other contract documents, and approvals on Applications for Payment. The Project Manager or Project Engineer may issue a Suspension of Work Notice if there is reasonable basis to believe that the Contractor is violating any condition or term of the contract or specifications, or that violations of health and safety standards will occur unless such notice is issued. No work shall proceed until the Suspension of Work Notice has been vacated.

01042 – MECHANICAL AND ELECTRICAL COORDINATION

The Contractor shall be responsible for the coordination of all mechanical and electrical aspects of the contract work. This includes overseeing of the general operation and maintenance of that equipment.

01043 – JOB SITE ADMINISTRATION

The Contractor shall be responsible for the administration of the contract work at the job site. This includes assuring that all equipment and materials used for the contract work meet the required specifications set forth and that all work is performed in a timely and orderly manner. The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs concerning the work. The Contractor shall designate a full time on-site superintendent or authorized representative who shall be present or can be contacted readily during project working hours. This person shall represent the Contractor in dealing with the Project Manager and shall insure adherence to these specifications and any other directives.

01050 – FIELD ENGINEERING

The Contractor shall be responsible for locating and avoiding all underground utilities at the contract work site. If damage to the utilities occurs during the contract work, the damage shall be repaired at the Contractor's expense.

The Contractor shall also be responsible for the proper setting of all construction staking. The Contractor shall provide engineering surveys for construction to establish reference points that are necessary to enable the Work to proceed. The Contractor shall be responsible for surveying and laying out the Work, shall protect and preserve any established reference points, and shall make no changes or relocations without the prior written approval of the Project Engineer. The Contractor shall report to the Project Engineer whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations. The Contractor shall replace and accurately relocate all reference points so destroyed, lost, or moved. When it becomes necessary in the construction of public works, to remove or obliterate any triangulation station, bench mark, corner monument, stake, witness mark, or other reference mark, it shall be the duty of the Contractor in charge of the work to cause to be established by a New Mexico registered land surveyor one or more permanent reference marks which shall be plainly marked as witness corners or reference marks, as near as practicable to the original mark, and to record a map, field notes, or both, with the county clerk and county surveyor of the county wherein located, showing clearly

the position of the marks established with reference to the position of the original work. The surveys or measurements made to connect the reference marks with the original mark shall be of at least the same order of precision as the original survey. The developed data shall be certified by a licensed surveyor and submitted to the AML.

01060 – REGULATORY REQUIREMENTS

The Contractor shall keep fully informed of all federal and state laws, all local laws, ordinances, and regulations, and all orders and decrees of bodies or tribunals having any jurisdiction or authority which in any manner affect those engaged or employed on the work or which in any way affect the conduct of the work. The Contractor shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees and shall protect and indemnify the State of New Mexico and its representatives against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor or any employees. The Contractor shall procure all permits and licenses, pay all charges, fees, royalties, and taxes, and give all notices necessary and incidental to the due and lawful prosecution of the work.

01090 – REFERENCES

Reference to standard specifications, manuals, or codes of any technical association, organization, or society, or to laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, laws, or regulation in effect at the time of opening of Bids, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual, or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of the Contractor.

01092 - ABBREVIATIONS

The following is an explanation of the abbreviations that may be used in the contract documents:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AML	Abandoned Mine Land Program of MMD
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
ATSA	American Traffic Services Association
AWS	American Welding Society
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CPR	cardiopulmonary resuscitation
CRSI	Concrete Reinforcing Steel Institute
EMNRD	Energy, Minerals, and Natural Resources Department (state)

FQCR	Field Quality Control Representative
H_2S	hydrogen sulfide
HASP	Health and Safety Plan
MBTA	Migratory Bird Treaty Act
MMD	Mining and Minerals Division of EMNRD
NMAC	New Mexico Administrative Code
NMSA	New Mexico Statutes Annotated
NTP	notice to proceed
OSHA	Occupational Safety and Health Administration
OSMRE	Office of Surface Mining, Reclamation, and Enforcement (federal)
PLS	Pure Live Seed
SAE	Society of Automotive Engineers
SDS	Safety data sheet
USFWS	United States Fish and Wildlife Service

01094 – DEFINITIONS

The following is a definition of the terms that may be used in the contract documents (source: A Dictionary of Mining, Mineral, and Related Terms, Paul W. Thrush, Bureau of Mines, Department of the Interior, Washington, D.C., 1968):

1. adit — A horizontal or nearly horizontal passage driven from the surface for the working or dewatering of a mine.
2. back — The roof or upper part in any underground mining cavity.
3. cribbing — The close setting of timber supports when shaft sinking through loose ground.
4. collar — Timbering or concrete around the mouth or top of a shaft; the junction of a mine shaft and the surface.
5. decline — See “incline”.
6. drift — A horizontal passage underground.
7. entry — A haulage road, gangway, or airway to the surface.
8. Field quality control representative (FQCR) — The individual given specific quality inspection tasks by the AML Program identified in the project Specifications.
9. gob pile — A pile of heap mine refuse on the surface.
10. incline — A shaft not vertical; usually on the dip of a vein.
11. lagging — Planks, slabs, or small timbers placed over the caps or behind the posts of the timbering, not to carry the main weight, but to form a ceiling or a wall, preventing fragments or rock from falling through.
12. lining — The brick, concrete, cast iron, or steel casing placed around a tunnel or shaft as a support.
13. loading chute — A three-sided tray for loading or for transfer of material from one transport unit to another.
14. portal — Any entrance to a mine.

15. red dog	Material of a reddish color resulting from the combustion of shale and other mine waste dumps on the surface.
16. shaft	An excavation of limited area compared with its depth, made for finding or mining ore or coal, raising water, ore, rock, or coal, hoisting and lowering personnel and material, or ventilating underground workings.
17. spoil	The overburden or on-ore material removed in gaining access to the ore or mineral material in surface mining.
18. stope	An excavation in which ore has been excavated in a series of steps.
19. stull	A timber prop set between the walls of a stope, or supporting the mine roof.
20. subsidence	A sinking down of a part of the earth's crust.
21. talus	A heap of coarse rock waste at the foot of a cliff.
22. tipple	Originally the place where the mine cars were tipped and emptied of their ore, and still used in that sense, although now more generally applied to the surface structures of a mine, including the preparation plant and loading tracks.
23. winze	Interior mine shaft.

01100 – SPECIAL PROJECT PROCEDURES

The following section describes special procedures for alteration, preservation, security, hazardous materials, and other types of projects demanding unique procedures. Safety procedures and methods for all underground work inside abandoned mine entries shall be in accordance with the "New Mexico Mine Safety Code for All Mines," published by the New Mexico Institute of Mining & Technology, State Inspector of Mines, Bureau of Mine Inspection, P.O. Box W105, Socorro, NM 87801, 1.505.835.5460.

01135 - HAZARDOUS AND CONFINED AREA PROCEDURES

This project requires construction work in, around, and over hazardous and unprotected mine shafts, stopes, adits, and other openings which may be open to the surface or hidden from view by vegetation, trash, debris, or thin and unstable layers of surface materials or rock. The Contractor shall be responsible for thoroughly investigating the site conditions and scheduling the Contractor’s equipment, equipment operations, personnel, and safety procedures to prevent accidents and injuries.

Before entry, the Contractor shall review safety procedures with all persons entering the mine. At least one standby person shall remain outside the mine during entry by others. The

standby person(s), whenever possible someone who is trained in CPR and mine rescue procedures, shall have access to first aid, appropriate rescue equipment, and a vehicle and shall know where the nearest telephone / cell service for emergency calls is found. A communication system shall be established between the person(s) working inside the mine and the standby person(s) outside.

All persons entering the mine opening shall wear appropriate clothing and carry appropriate gear, including, as required for the conditions present, harnesses, head, hand and foot protection, life lines, respirators or self-contained breathing apparatuses, and other special equipment. Proper ventilation and adequate lighting at the workplace inside the mine entry shall be provided. The Contractor shall review with their workers and personnel the use of hazardous chemicals or materials, electrical power, or internal combustion engines inside mine entries for safety precautions and procedures.

The Contractor is fully responsible for construction safety and shall keep the Project Manager informed of his hazardous area safety procedures. Following is a discussion of some common abandoned mine hazards and appropriate procedures to be followed.

I. Bad Air

Miners use the term "bad air" to describe an atmosphere that will not support life. The poor air circulation in some mine openings can allow carbon dioxide (CO_2), carbon monoxide (CO), methane, hydrogen sulfide (H_2S), or radon gas to accumulate. These gases are treacherous inside mine openings and even experienced miners have been killed or harmed by entering areas containing them. CO (product of combustion) cannot be readily detected and is lethal in very small amounts. The Contractor shall follow the following and other appropriate hazardous bad air procedures.

An oxygen meter shall be used to test air before and while any personnel work inside a mine opening. The oxygen meter shall be a National Mine Service (NMS) OX231 oxygen meter or equivalent. The oxygen meter shall continuously monitor oxygen levels and have an audible warning signal. If the oxygen level falls below 19 percent, all personnel shall withdraw from the working area in the mine until the oxygen content increases to safe levels.

Any remedy for increasing oxygen content of the working area or providing ventilation from the surface shall be determined in consultation with the Project Manager.

Adit Cave-ins

Cave-ins are a danger in any abandoned mine. Disturbances such as vibrations caused by walking, speaking, blasting, hammering, percussion drilling, or construction equipment may cause a cave-in inside an inactive mine. The Contractor shall follow appropriate adit cave-in protection procedures, including scaling and barring of loose rock before beginning work in an area, shoring of decayed or weak timber framing, and shoring, jacking, or rock bolting of materials in the back (roof) and sides of the adits.

Collar Cave-ins

The collar or top of a shaft, stope, or subsidence often contains decomposed rock, decayed timbers, and other conditions that allow for rapid disintegration at the opening. With the additional weight and vibration of construction machinery, workers, and backfilling operations near the mine opening, the area around the collar can slide into the opening, along with nearby machinery and laborers. Backfilling operations can tear loose cribbing or lining in a shaft leading to collapse at the collar. The Contractor shall follow appropriate collar cave-in protection procedures.

Falling

Because a shaft or stope has little light, the feeling of height and normal reaction to "pull back" is not evident to most persons. Many abandoned mine shafts, stopes, and winzes are deep enough to cause injury or death to persons entering these features. Rescue operations of a fallen person can also be extremely hazardous.

01170 - INDUSTRIAL WASTES AND TOXIC SUBSTANCES

The Contractor shall comply with all applicable laws and regulations existing or hereafter enacted or promulgated regarding industrial wastes and toxic substances. In any event, the Contractor shall comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, et seq.) regarding any toxic substances that are used, generated by or stored at the project site. See 40 CFR, Part 702799. Additionally, any release of toxic substances (leaks, spills, etc.) greater than the reportable quantity established by 40 CFR, Part 117, shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Section 102b. A copy of any report required or requested by any federal agency or state government because of a reportable release or spill of any toxic substances shall be furnished to the Project Engineer concurrent with the filing of the reports to the involved federal agency or state government.

01200 – PROJECT MEETINGS

The following sections describe the required project meetings that the Contractor is expected to attend.

01210 - PRECONSTRUCTION CONFERENCES

Before starting work at the site, a conference will be held to review the construction schedules; to establish procedures for handling documents, drawings, other submissions, and for processing Applications for Payment; and to establish a working understanding between the parties as to the nature of the project. Present at the conference will be the Project Manager, the Project Engineer, the Contractor, the Contractor's superintendent, and other persons as appropriate. The Contractor shall present a progress schedule at the preconstruction conference as specified in Section 01310 below and a fire prevention and awareness plan as specified in Section 01565 below.

01220 - PROGRESS MEETINGS

Progress meetings may be held during construction for purposes of scheduling and coordination of work. Throughout the life of the project, the Contractor shall keep the Project Manager and Project Engineer well informed of the schedule of work.

01300 – SUBMITTALS

The following sections describe the required documents and reports to be submitted by the Contractor during the contract work.

01310 - PROGRESS SCHEDULES

The Contractor shall provide a detailed progress schedule to be followed in completing the work. This schedule shall be submitted in writing at the preconstruction conference and shall show the anticipated time required by the Contractor to complete each item of work in the Bid Form. Schedules may be prepared as a horizontal bar chart with a separate bar for each major portion of work or operation, identifying the first workday of each week.

01320 - PROGRESS REPORTS

The Contractor shall submit written accurate daily progress reports to the Project Manager. The reports shall include but are not limited to work accomplished, quantities of unit price bid items installed, including load tickets as appropriate, records of any complaints including corrective actions taken, records of visitors to the site, and records of any personal injury or property damage incidents. The Contractor's authorized representative shall meet the Project Manager a minimum of once each week to verify and sign-off on all payable units of work performed during that week. The authorized representatives from both parties shall be designated at the start of the project during the preconstruction conference.

01330 – HEALTH AND SAFETY PLAN

The Contractor shall prepare a Health and Safety Plan (HASP) detailing the site-specific hazards and safety precautions associated with site work. The HASP shall comply with OSHA standards and shall include a list of responsible persons, hazard identification, hazard controls and safe practices, emergency and accident response, employee training requirements, SDS, and communication information and procedures.

The HASP shall also describe hazards related to the COVID-19 Pandemic. The HASP shall include the Contractor’s Infections Disease Preparedness and Response Plan, which shall include:

- Where, how, and to what sources of Covid-19 site personnel might be exposed.
- Non-occupational risk factors at home and in community settings.

- Workers' individual risk factors (e.g., older age; presence of chronic medical conditions, including immunocompromising conditions; pregnancy).
- Controls necessary to address these risks.
- Basic infection prevention measures.
- Policies and procedures for prompt identification and isolation of sick people.
- Workplace controls for reducing the risk of Covid-19 spread in the workplace.

Additional information and safety resources related to COVID-19 can be found on OSHA's website: https://www.osha.gov/SLTC/covid-19/

Contractor shall follow New Mexico Department of Health Public Health Orders, Executive Orders, and COVID safe practices for construction. Additional information maybe be found on the New Mexico Department of Health Coronavirus Disease 2019 webpage at https://cv.nmhealth.org/.

The Contractor shall submit a draft of the HASP to the Project Engineer for review and comment a minimum of one month before mobilization to the site. The Contractor shall finalize the HASP and submit a final copy to the Project Engineer a minimum of 10 days prior to beginning work on the project site.

01340 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

The Contractor shall submit shop drawings, product data, and samples as required in the specifications. Submittals shall be organized such that each submittal covers items in no more than one specification section. The Contractor shall allow a minimum of 14 calendar days for the Project Engineer's review; shorter periods for Project Engineer's review will not be acceptable. The Contractor shall allow acceptable time for the entire review process including transmittal, initial Project Engineer's review, correction and resubmission, final review, and distribution.

Engineering data and shop drawings covering all equipment and fabricated materials shall be submitted to the Project Engineer for review and comments. These data shall include drawings and descriptive information in sufficient detail to show the kind, size, arrangement, and operation of component materials and devices; the external connections, anchorages, and supports required; and performance characteristics and dimensions needed for installation and correlation with other materials and equipment. Data submitted shall include drawings showing essential details of any changes proposed by the Contractor.

It shall be the duty of the Contractor to check all data and shop drawings for completeness before submittal for Project Engineer's review. Each drawing or data sheet shall have indicated there on the proposed use of the item as it pertains to the Work. Catalog cuts, pages, or copies submitted for review shall have items proposed for use in the Work clearly marked and identified. The current catalog number, date, and revision and drawing number (if applicable) shall be included.

Deviations from the drawings or specifications shall be identified on each submittal and shall be referenced in the Contractor's transmittal letter. The submittal for such deviations shall also include details of changes proposed and modifications required for all affected portions of the Work.

Shop drawings and other review data shall be submitted to the Project Engineer only from the Contractor.

The Contractor's submittal of shop drawings and other review material shall represent that the Contractor has reviewed the details and requirements of the Contract Documents, has coordinated the subject of the submittal with other portions of the Work, and has verified dimensions, quantities, construction details, materials, and installation criteria, as applicable for the Work. The Contractor shall accept full responsibility for the completeness of each submittal and, for re-submittals, verify that exceptions noted on the previous submittal have been accounted for.

Any requirement for more than one resubmission or delay in obtaining Project Engineer's review of submittals will not entitle the Contractor to an extension of Contract Time unless authorized by Change Order.

The Project Engineer's review of drawings and data submitted by the Contractor will cover only general conformity to the drawings and specifications, external connections, and dimensions that affect the plans and layout. The Project Engineer's disposition of submittals will not constitute a blanket approval of all dimensions, quantities, and details of the material, equipment, or item shown. Regardless of the corrections made in, or disposition given to, such drawings and data by the Project Engineer, the Contractor shall be responsible for the accuracy of such drawings and data and for their conformity and compliance with the contract documents.

No work shall be performed in connection with the fabrication or manufacture of materials and equipment, nor shall any material, accessory, or appurtenance be purchased until the drawings and data therefor have been reviewed.

Four copies of each drawing and necessary data shall be submitted to the Project Engineer. Each drawing or data sheet shall be clearly marked as instructed above. Submittals will be accepted only from the Contractor.

When the drawings and data are returned NOT APPROVED or RETURNED FOR CORRECTION, corrections shall be made as noted by the Project Engineer and four corrected copies resubmitted as instructed above.

When drawings and data are returned marked NO EXCEPTIONS NOTED, EXCEPTIONS NOTED, or RECORD COPY, no additional copies need be submitted.

The Project Engineer will return two copies with comments to the Contractor. The Contractor shall send additional copies with the original submittal if the Contractor requires more than two copies.

All drawings and data, after final processing by the Project Engineer, shall become a part of the contract documents and the work shown or described thereby shall be performed in conformity therewith unless otherwise required by the Project Engineer.

01380 - CONSTRUCTION PHOTOGRAPHS

At the request of the AML Program, the Contractor shall provide routine periodic construction photographs to support Applications for Payment and to supplement Project Record Documents.

01400 – QUALITY CONTROL

The following sections outline the duties, responsibilities, and qualifications of inspectors, testing laboratories, and the Contractor's quality control requirements required to perform the contract work.

01405 - CONTRACT QUALITY CONTROL

The Contractor shall be responsible for the maintenance of quality control throughout the period of the contract work. This includes making periodic spot checks to assure that equipment, materials, and construction quality, meet the contract specifications.

01410 - TESTING LABORATORY SERVICES

Independent commercial testing laboratories shall perform all tests required by the contract documents to determine compliance with the specifications. The testing laboratories shall be acceptable to the Project Engineer. The laboratories shall be in the regular business of testing services in accordance with the specifications for which tests are required, and shall be staffed with trained and experienced technicians, equipped properly, and fully qualified to perform the specified tests in accordance with reference standards.

All testing services for tests of materials required by the contract documents shall be the responsibility of the Contractor. The Project Engineer shall review all sources of materials before delivery of the materials to the job site. Before the performance of any testing, the Contractor shall obtain the concurrence of the Project Engineer for the laboratory or laboratories selected by the Contractor.

The Contractor shall require the producer or manufacturer of materials, for which the specifications require inspection or testing services during the production or manufacturing process, to arrange for and pay an independent organization to perform the specified services.

The Project Manager will determine the exact time and location of field sampling and testing. The Project Manager or Project Engineer may require additional sampling and testing as necessary to assure that materials conform to the contract documents. The Contractor shall pay the

costs of any retesting or re-sampling required when initial tests or samples fail to meet the specified requirements.

Written reports of tests furnished by the Contractor for the Project Engineer's review shall be submitted in conformance to the procedures set forth in Section 01340.

01500 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

The following sections specify the types of construction facilities and temporary controls the Contractor shall provide for completion of the contract work.

01505 – MOBILIZATION AND DEMOBILIZATION

The Contractor shall furnish and mobilize all specified construction facilities, temporary controls, equipment, labor, materials, power, supervision, and supplies to the site and commence work within 30 working days after receipt via certified mail of the Notice to Proceed. Mobilization/demobilization includes everything necessary to complete the required contract work. The Contractor shall inform the Project Manager of plans and schedules to move all equipment, machinery, and supplies to the job site. The Contractor shall locate and position the staging area including field offices, parking, storage, and support facilities as directed and approved by the Project Manager. All equipment and machinery shall be moved onto the job site in conformance with previously approved plans and schedules. It is the Contractor's responsibility to arrange for storage facilities for equipment and materials. City, state, federal, or other public or private property shall not be used as temporary storage or parking areas for any equipment or materials unless written clearance is obtained by the Contractor from the appropriate public officials or private individuals. The Contractor must be prepared to move all necessary equipment to each construction site within the project area. This movement of equipment shall be at the Contractor's expense and should be covered under Bid Item No. 1, Mobilization/Demobilization, on the Bid Form.

01510 - TEMPORARY UTILITIES

The following sections describe temporary utilities, controls, facilities, and construction aids required during construction. They include requirements for installation, maintenance, and removal.

01516 - TEMPORARY SANITARY FACILITIES

The Contractor shall provide temporary sanitation facilities during the contract work, and made available to MMD personnel. The facility shall be installed on the project site in a location removed from the immediate contract work area. Sanitation facilities (portable toilet units) shall include a handwash station. Sanitation unit(s) shall be staked down to prevent tipping from high winds. The facility shall be locked to prevent unauthorized access during the times work is not conducted.

Sanitation facilities shall be maintained and serviced at least once a week, unless more frequent service is necessary. The Contractor shall remove the facility upon completion of the contract work and restore the area.

01530 – BARRIERS AND ENCLOSURES

The Contractor shall provide barricades with blinking markers for all equipment on roadways and pedestrian walkways. The barricades shall be no less than twenty feet from the front and rear of any equipment in the described rights-of-way. Traffic control devices shall be in substantial conformance with the American Traffic Services Association (ATSA) Guide for Work Area Traffic Control. The Contractor shall remove the barricades upon completion of the contract work.

01533 - TREE, PLANT AND WILDLIFE PROTECTION

I. Tree and Plant Protection

Environmental disturbance shall be kept to a practical minimum.

In steep areas and around vegetation, the Contractor shall, before beginning work, discuss the planned extent and nature of disturbance with the Project Manager. Existing plants and trees shall be protected from damage or injury resulting from the Contractor's operations. Damaged trees and shrubs shall be trimmed to remove broken limbs where minor damage has occurred. Where directed by the Project Manager, cut or scarred surfaces of trees or shrubs shall be treated with a heavy coat of a tree sealant approved by the Project Manager.

II. Wildlife Protection

All area wildlife, including bats and owls, that may be in the area of nearby former mine features are protected, and this subsidence mitigation project shall not adversely affect them. Shooting at and chasing wildlife is prohibited.

01535 - PROTECTION OF INSTALLED WORK

The Contractor shall protect installed work and control traffic in the immediate area to prevent damage from subsequent operations. Installed work includes existing safeguard measures (gates, adit closures, vents, etc.) and interpretive signs/infrastructure.

01540 – SECURITY

The Contractor shall act to assure the protection of the contract work and equipment at the contract work site. The Contractor shall furnish, install, and maintain safety fences around any hazardous or high-voltage equipment at the site for the duration of the project. Where appropriate, the Contractor shall restrict access to the project site by barricading access roads during off-hours and by posting "No Admittance" and "Hard Hat Area" signs.

The Contractor shall be responsible for the safety and security of equipment and materials. The Contractor may not claim damages or hold the State of New Mexico, the property owner, the property custodian, or the design engineer responsible for stolen, damaged, or vandalized materials and/or equipment. The work site will be accessible to the public during the construction period and fencing the entire site for security purposes is not practical.

Temporary fencing shall be placed around active work areas during off-hours.

01550 – ACCESS ROADS AND PARKING AREAS

All Contractor personnel and equipment shall enter and leave the project site via existing roads and trails. Upon the regrading, recontouring, or reclamation of any part of the site, further vehicular use shall be limited to that necessary to complete operations.

The Contractor shall advise the Project Manager and obtain prior approval every time any road base material, compaction, or general road improvement work is required to address the impacts of heavy traffic due to construction. Road repairs will be completed as necessary to facilitate access of concrete trucks and other necessary construction equipment.

01560 – TEMPORARY CONTROLS

The Contractor shall take all reasonable steps to reduce any inconvenience and disruption to the public because of this project. The Contractor shall provide the following temporary controls for the duration of the contract work.

01561 - CONSTRUCTION CLEANING

The Contractor shall keep the contract work area, equipment, and adjacent areas free from spillages of construction and maintenance materials during the contract work. The Contractor shall also provide for the containment of solid debris created by unpackaging construction materials and waste from meals consumed at the contract work site. The Contractor shall assure the cleanup and removal of all spillages and solid debris to an approved disposal site at the end of each contract workday.

01562 - DUST CONTROL

The Contractor shall take all necessary measures to control dust emanations from the construction equipment. The Contractor shall assure that the equipment used in the contract work is fitted with all standard dust control devices. To maintain the health and safety of project personnel, dust control measures at this site shall comply with all local, state, and federal health and safety regulations. The Contractor shall be prepared to begin dust control measures anytime at the request of the Project Manager. Water for dust control shall be distributed in sufficient quantity and at proper times by water truck(s) equipped with spray bars, cannons, and hoses (of sufficient lengths) approved by the Project Manager. The quantity of water required and the

frequency of watering shall be dependent upon the weather and the site's surface conditions and may vary throughout the project duration.

There is no source of water on site for dust suppression. The contractor shall be responsible for identifying a source for water and providing dust suppression at no additional cost to the project.

01564 - NOISE CONTROL

The Contractor shall assure that all equipment used in the contract work is fitted with standard noise suppression devices.

01565 - FIRE PREVENTION AND SAFETY AWARENESS

The Contractor shall develop an emergency plan that will outline precautionary measures and identify initial attack resources and procedures in case of a fire incident. This plan will be submitted to the Project Manager at the Pre-Construction meeting. The Project Manager will then provide feedback about the plan. The Contractor shall provide the fire emergency plan to all individuals working on this project.

Examples of precautionary measures might be:

1. Inspect all motorized and mechanized equipment to insure mufflers and spark arresters are operating properly.

2. Insure personnel are properly trained on the safe use of welding torches, arc welders, generators, saws, power grinders, chainsaws, and other tools and are also familiar with the potential of this equipment to create hot sparks and ignite fires.

3. Avoid welding or cutting in areas next to and above flammable materials or during windy conditions. This would pertain to materials inside the mine as well as outside the mine. Welding shall not take place within 25 feet of polyurethane foam during application. After its application, welding shall not take place above it without first covering the surface with at least 6" of fill material.

Examples of resources and procedures might be:

1. Implement a Hot Work Permit process to be issued for each hot work event.

2. Maintain adequate fire extinguishers, water tanks, sprayers, and other equipment at the work site that would enable personnel to immediately extinguish any accidental ignition.

3. Have personnel observe the work area while welders are operating (welders cannot see where the sparks are falling when the welder is under the welding hood).

4. Assign an individual to be responsible for the area being "safe" (no hot sparks, iron is cold) before leaving the work site.

5. Develop an emergency notification procedure in case the fire incident is or appears to be reaching an out-of-control status.

The Contractor shall obey all fire restrictions declared by the landowner(s) or adjoining property management agencies (i.e. University of New Mexico, U.S. Forest Service, and/or Bureau of Land Management).

01566 – PUBLIC SAFETY

Efforts to protect visitors from injury due to execution of the work shall be taken wherever practical. Examples of procedures that shall be followed include:

1. Use of caution signage.
2. Maintaining cleared unimpeded access to upper parking area.
3. Securing of unused materials and equipment.
4. Cordon off active work areas using flagging (12-inch by 9-inch orange triangles, minimum) and/or construction fencing.

01570 – TRAFFIC REGULATION

The Contractor shall take the following measures for regulation of traffic at the contract work site.

01572 – FLAGGERS

The Contractor shall post flaggers during the off-loading and on-loading of equipment or materials in roadways at the contract work site access road entrance and/or during cleaning of the highway surface. The flaggers shall halt traffic during the off-loading or on-loading process or direct traffic to an alternate route.

01574 - HAUL ROUTES

The Contractor shall consult with the authority having jurisdiction in establishing public thoroughfares to be used for haul routes and site access. Any damage to the site access road from driving on wet/muddy surface shall be repaired at the end of the project, or as necessary throughout the project to maintain contractor and public access to the site, as directed by the project engineer.

01580 – PROJECT IDENTIFICATION AND SIGNS

At least one temporary project sign shall be furnished and erected by the Contractor at the most convenient point of public access to the project site. The proposed sign location, message content, and font size shall be preapproved by contractor submittal, including sign mockup, prior to installation. The project identification sign shall be installed within ten (10) working days after the receipt via certified mail of the NTP or within five days after the Contractor initially mobilizes to the project site, whichever happens first. The sign is to be a minimum of four feet

by eight feet by three quarter inch (4' x 8' x 3/4") exterior grade plywood and shall provide the project title, project number, and other data within the box as appearing on the Title Page of this document. The lettering shall be a minimum of two-inch tall Tahoma font, with project name shown in bold font, and with capitalization and word organization as shown on the Title Page of this document. Exterior quality paint in contrasting colors shall be used. The Contractor shall remove sign, framing, supports, and foundations at completion of Project and restore the area. Any costs connected to the construction, painting, erection, and later removal of the sign should be covered under Bid Item No. 1, Mobilization/Demobilization, on the Bid Form.

Sample of Sign:

[PROJECT TITLE]

[Nearest Municipality], [County], New Mexico

PROJECT NO. EMNRD-MMD-####-##

PLEASE PARDON THE INCONVENIENCE WE ARE PERFORMING MINE RECLAMATION SERVICES

PLEASE AVOID AREAS IMPACTED BY WORK ACTIVITIES

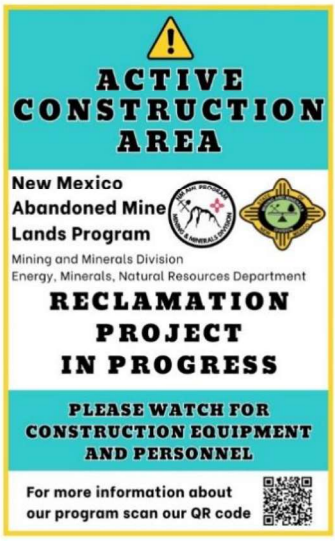
WORK AUTHORIZED BY:

ABANDONED MINE LAND PROGRAM, MINING AND MINERALS DIVISION

ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT STATE OF NEW MEXICO

EMNRD PROJECT MANAGER: ####### CONTRACTOR: ###########
CONTACT NUMBER: (505) ###-#### CONTACT NUMBER: (###) ###-####

Portable A-frame folding construction-warning signs shall be provided by the Project Manager and erected on vehicular access routes and hiking trails to the project site. The Contractor shall provide sandbags for ballast to stabilize the signs against high winds. Folding signs shall be returned to the Project Manager upon completion of the project. Sample of portable folding signs:



01590 – FIELD OFFICES AND SHEDS

Portable or mobile buildings, or buildings constructed with floors raised above ground, may be provided by the Contractor in locations approved by the Project Manager and the landowner. At completion of work, the Contractor shall remove all buildings, foundations, utility services, and debris and restore areas.

01600 – MATERIALS AND EQUIPMENT

All materials and equipment required to complete the work shall be as specified. Any substitution to the specified products requires prior approval by the Project Engineer.

All bid items are to be NEW and of most current production, unless otherwise specified. As required by Section 70914 of the Bipartisan Infrastructure Law (also known as the Infrastructure Investment and Jobs Act), P.L. 117-58, on or after May 14, 2022, none of the funds under a federal award that are part of federal financial assistance program for infrastructure may be obligated for a project unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States, unless subject to an approved waiver. The requirements of this section must be included in all subawards, including all contracts and purchase orders for work or products under this program. **Review notice *Buy America Domestic Procurement Preference* above for additional information.**

01700 – CONTRACT CLOSEOUT

The following sections specify the duties and responsibilities of the Contractor to close out the contract.

01701 - CONTRACT CLOSEOUT PROCEDURES

When work is completed, the Contractor shall submit project record documents to the Project Manager.

01702 - FINAL Inspection

Upon written notice from the Contractor that the entire Work or an agreed portion thereof is complete, the Project Engineer will make a final inspection with the Project Manager and Contractor and will notify the Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. The Contractor shall immediately take such measures as are necessary to remedy such deficiencies.

01710 - FINAL CLEANING

After completion of all work, the Contractor shall demobilize and remove all equipment, materials, spills, supplies, and trash from the project site and shall reclaim all areas disturbed by the Contractor's activities. Unless otherwise specified, developed, maintained roads that existed

before commencement of the Contractor's activities need not be reclaimed, but must be left in a condition equal to or better than what existed before the Contractor's activities began. Fences, gates, plants, sod, and other surface materials disrupted by these operations shall be replaced or restored to original or better conditions immediately upon completion of work at the site. This shall include sweeping or cleaning the asphalt pavement on the highway if mud or soil is tracked onto the asphalt from the site access road. Other damage to private or public property shall be immediately repaired. All such cleanup, repair, or replacement work shall be done at the Contractor's expense and to the satisfaction of the Project Manager pending approval of the appropriate public officials and property owners. Payment for Demobilization should be covered under Bid Item No. 1, Mobilization/Demobilization, on the Bid Form.

01720 – PROJECT RECORD DOCUMENTS

The Contractor shall prepare final Project Record Documents providing information regarding all aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination. At Contract closeout, the Contractor shall deliver Project Record Documents and samples under provisions of Section 01701.

END OF DIVISION 1

DIVISION 2 – SITEWORK

The following sections describe the sitework to be performed under this contract.

02100 – SITE PREPARATION

02110 - SITE CLEARING

This work shall consist of trimming, removing, and disposing of vegetation and debris in accordance with these specifications, except those items designated to remain. This work shall also include the preservation from damage or defacement of all vegetation and items designated to remain.

Trimming shall consist of pruning low-hanging branches from trees and shrubs designated to remain to provide enough clearance for construction activities. Removal shall consist of cutting vegetation flush with the ground surface and the satisfactory disposal of trees, brush, and any other vegetation. The Contractor shall perform selective tree and shrub removal and trimming only in designated work areas as shown on the drawings.

The Contractor shall remove vegetation outside of the migratory bird nesting season (March 1 – July 1). If any vegetation is to be removed during the migratory bird nest season, the Contractor shall contact the Project Manager four weeks prior to the removal to allow for completion of a migratory bird survey.

Within construction limits for borrowing backfill material, all surface debris, roots, stumps, trees, and other objectionable protruding obstructions shall be cleared with the Project Manager's concurrence.

All vegetation from trimming and removal operations shall be spread along and adjacent to the disturbed area as practicable and as designated by the Project Manager.

02200 – EARTHWORK

The following sections describe the earthwork to be performed under this contract.

02210 - GRADING

The following sections describe the grading to be performed under this contract.

02212 - DECOMPACTION

Before construction demobilization and following the need for any construction access to the site, the Contractor shall decompact areas compacted by construction activity, including temporary work areas, and staging, storage and parking areas outside of the roadway.

Where bedrock is exposed at the surface, such decompaction will not be required. Decompaction methods shall be effective at reducing soil density to a minimum depth of twelve inches (except where bedrock is closer to the surface) and shall be accomplished without inverting the soil layers. Where practicable, ripping shall be done along the contour. Alternatives to ripping or auguring for decompaction shall be acceptable to the Project Engineer.

02220 - COMPACTING

See Section 02840 – Base Course for base course compaction specifications.

02800 - SITE IMPROVEMENTS

Cattle guards, fences, gates, and other road or street improvements destroyed, removed, or damaged during construction shall be replaced with the same type and dimensions of units removed and shall be equal to and consistent with the undisturbed portions of the improvements existing before the project.

02830 - FENCES

Fencing Specifications shall conform to the requirements set forth in AASHTO M181, the New Mexico Standard for Public Works Construction, Section 410 and NMSA 1978, Sections 77-16-1 through 77-16-18, as modified below.

I. General

The Contractor shall submit one test certificate each to the Project Engineer certifying that the fencing materials conform to the requirements herein provided. When the locations of manufacturing plants allow, the plants may be inspected for compliance with specified manufacturing methods and material samples will be obtained for laboratory testing for compliance with material quality requirements. This can be the basis for acceptance of manufacturing lots as to quality. All materials will be subject to inspection for acceptance as to condition to check for compliance before or during incorporation of materials in the work. All fences shall be installed in the locations specified and as directed by the Project Manager.

II. Wire Fence

This work shall consist of the construction of fence in substantial compliance with the specifications, lines and grades shown on the plans or established by the Project Engineer.

A. Wire

All fences shall consist of six wires spaced as indicated.

Barbed wire shall conform to ASTM A121 Class 1 or 3 coating and shall consist of two strands of nominal 12 gauge (0.099-inch) coated diameter wire with either 2-point, fourteen gauge

(0.080-inch) diameter barbs spaced approximately four inches apart or 4-point, 14 gauge (0.080-inch) barbs spaced approximately five inches apart. The shape of barbs may be flat, half-round, or round. Instead of galvanizing, the wire may be coated with aluminum alloy at the rate of not less than 0.30 ounces per square foot of wire surface and the barbs at the rate of not less than 0.25 ounces per square foot of wire surface.

Tie wires for fastening barbed wire to steel posts shall be not less than thirteen gauge (0.109-inch) coated diameter and galvanized conforming to ASTM A1 12. Eleven gauge (0.120-inch) coated diameter or heavier wire fasteners or metal clamps may be used instead of tie wires when approved in advance by the Project Engineer.

Stays for wire fences shall be not less than 9 gauge (0.142-inch) coated diameter galvanized wire conforming with ASTM A1 16 and of length and spacing shown on the plans.

B. Brace Panels and Posts

Intermediate brace, gate brace and corner panels shall be prefabricated assemblies, "Easy Fence" by D-C Industries (Blackfoot, ID, 208.782.1177) or approved equivalent, which require no concrete footings. They shall be installed following the manufacturer's recommendations.

Line posts shall be metal. All posts shall be of the type, size and length shown on the plans and as herein provided.

Metal posts shall be fabricated from rail, billet, or commercial grade steel conforming to ASTM A702 and shall be galvanized or painted green as required. All metal posts throughout the project shall be either galvanized or painted the same color green. Galvanizing shall conform to ASTM A123. When painted green, the posts shall be cleaned of all loose scale before finishing and painted with one or more coats of weather resistant, air baking or drying, green paint or enamel.

Metal line posts shall consist of heavy-duty steel spaced sixteen and one half feet apart. Metal line posts shall have a minimum weight of 1.33 pounds per foot exclusive of anchor plates. A minus tolerance not to exceed 5 percent of the minimum weight of each post will be permitted. A plus tolerance of two inches and a minus tolerance of one inch in the length of each post will be permitted. Metal line posts may be I-beam, T-beam, U-beam, Y-beam, or H-column section.

Line posts shall be provided with corrugations, lugs, ribs, or notches spaced approximately one inch on centers to engage the required fence wire in designated spaces. Posts with punched tabs to be crimped around the wire will not be accepted. Anchor plates shall be an area of not less than eighteen square inches, shall weigh not less than 0.67 pound each and shall be securely welded, bradded, swaged, or riveted to each line post in a way that prevents displacement when the posts are driven.

C. Fittings

All fittings, hardware and appurtenances for fences shall be commercial quality steel, malleable iron, or wrought iron and shall be galvanized in accordance with the requirements of ASTM A153. Fittings shall be black PVC-coated with ultraviolet-resistant coating.

III. Construction

The Contractor shall perform such clearing and grubbing as may be necessary to construct the fence to the required grade and alignment. At locations where fence runs are completed, appropriate adjustment in post spacing shall be made to conform to the requirements for the type of closure indicated.

The tops of all posts shall be set to the required depth and alignment. Cutting off the tops of posts shall be allowed only with the approval of the Project Manager and under the conditions specified. Wire or fencing of the size and type required shall be firmly attached to the posts and braced in the manner indicated. All wire shall be stretched tautly and shall be installed to the required elevations.

Wire fences shall be constructed in conformity with the details and at locations shown on the plans or staked by the Project Manager. All posts shall be set plumb and to the depth and spacing shown on the plans. Excavations for footings and anchors shall be to dimensions shown on plans or established by the Project Engineer. Metal line posts may be driven. Posthole backfill shall be placed in thin layers and each layer solidly compacted. Posts set in rock shall be placed as directed by the Project Manager.

Mechanical stretcher or other device designated for such use shall stretch fence wire and welded wire fabric. Stretching by motor vehicle will not be permitted. The length between pull posts shall not exceed nine hundred ninety feet for barbed wire fence.

Intermediate braces shall be placed at intervals not to exceed nine hundred ninety feet and shall be spaced evenly between corner posts.

Corner posts and braces shall be placed at appropriate fence angles or bends.

Fence materials of the same manufacturer, type, or process, conforming to the specifications and details shown on the plans, shall be used throughout the work unless otherwise authorized in writing by the Project Engineer.

Contractor personnel shall follow site safety requirements and use of personal protective equipment. Installation of fencing within 10 feet of the top edge of the highwall or near vertical slope shall be executed while wearing and maintaining fall protection equipment.

02840 – BASE COURSE

This Work consists of removing, hauling, processing, and placing existing Base Course material.

I. Materials, General

A. Base Course consists of one (1) or more of the following:
B. Crushed stone;
C. Crushed or screened gravel;
D. Sand;

Base Course does not contain organic matter or other Deleterious Materials, including silt and clay balls.

II. Aggregate Acceptance

The Base Course acceptance will be based on periodic random samples. Unless the Contract specifies otherwise, combine the aggregate Materials in proportions that produce a homogeneous composite blend in accordance with Table II, "Type I Base Course Gradation Band."

Table II
Type I Base Course Gradation Band

Sieve size	% passing
1.0 inch	100
¾ inch	80-100
No. 4	30-60
No. 10	20-45
No. 200	3.0-10.0

Ensure that at least 50% of the Materials retained on or above the No. 4 sieve have at least two (2) Fractured Faces when evaluated in accordance with AASHTO T-335, "Determining the Percentage of Fracture in Course Aggregate". Provide Base Course from a material source with a maximum AI of 35 when calculated in accordance with Section 901, "QUALITY CONTROL/QUALITY ASSURANCE (QC/QA)," a maximum LL of 25, and a maximum PI of 6. Determine the AI for the untreated natural aggregate source.

III. Construction Requirements

A. Mixing and Placing

Mix the Base Course Material to a homogenous mixture. Place maximum six (6) inches (compacted) lifts, unless specified otherwise. Do not place on frozen Subgrade. Compact Base Course to at least 96% of maximum density with rammer/jumping jack compactor to the acceptance of the Engineer.

Base Course shall be constructed in compacted layers of uniform thickness. Base Course shall be conditioned with water to improve compaction. Fill material which contains excessive moisture shall not be compacted until the material is dry enough to obtain relative compaction.

The loose thickness of each layer of Base Course material before compacting shall not exceed 8 inches, except as approved by the Project Manager. Any rock greater than 1 inch in any dimension shall be removed from the fill material prior to compaction.

B. Removing and Processing Base Course

Minimize contamination of Base Course Material when removing it from the Roadway.

C. Acceptance

Base Course Materials will be accepted based on samples taken in accordance with minimum testing requirements after placement but before compaction. Acceptance will be in accordance with Section 02840. If necessary, re-work the Base Course until all requirements are met.

IV. Method of Measurement

The cubic yardage of the Base Course used will be based on the amount delivered. No additional payment shall be made for stockpiled or excess material. Where not all delivered Base Course Materials are used, the cubic yardage shall be determined based on the road area covered and depth of coverage.

V. Basis of Payment

The accepted quantities of Base Course will be paid as determined in the Acceptance section of Section 02840.

Pay Item	Pay Unit
Imported Base Course	Cubic Yard

02900 - LANDSCAPING

The following sections describe revegetation to be performed under this contract. Revegetation shall be required at areas disturbed during construction and as specified by the AML Project Manager.

02920 – SOIL PREPARATION / SURFACE ROUGHENING

Prior to seedbed preparation, the Contractor shall grade all disturbed areas as described, decompact those areas specified above, and roughen the surface as specified below.

On slopes up to 1.5h:1v, the soil surface in areas to be seeded shall be prepared to be continuously rough and hummocky. This shall be accomplished by using an excavator bucket, or other acceptable methods that produce similar results, to create small pockets and furrows to trap water and create favorable microclimates for plant growth.

After roughening, seed shall be broadcast or hydroseeded as specified below. In areas with extremely dry and loose soil, the Project Manager may require the Contractor to wait until the soil has settled before seeding.

Large and small boulders may be left exposed on site prior to seeding, either singly or in groupings that blend with the natural surroundings, as directed by the Project Manager. The Project Manager may require that additional boulders be placed on site to enhance visual variation and provide wildlife habitat.

Unless the soil is severely compacted or as otherwise noted, soil preparation will not be required for discontinuous, isolated areas of disturbance less than 0.05 acres (approximately 2,500 square feet or 50 feet by 50 feet).

The extent of seedbed preparation shall not exceed the area on which the entire seeding operation can be applied. Seed shall be applied before soil surface crusting occurs. Loss of seed and fertilizer due to erosion shall be prevented from occurring. If crusting or erosion occurs, the entire area affected shall be reworked beginning with seedbed preparation.

02921 - TOPDRESSING

As specified, on construction sites, mined areas, and other critical areas where the existing surface material is either chemically or physically unsuited to support adequate vegetation, the best available soil material as determined by the Project Manager shall be evenly spread on the surface in sufficient depths to maintain plant growth. Available topdressing in all areas to be disturbed shall be set aside prior to deeper soil disturbance for excavation and mine feature backfilling.

Topdressing shall be applied generally along the contour, but if hazardous conditions arise, the application may be in another direction. In all cases, placement shall be such that erosion is kept to a minimum. All topdressed slopes shall be prepared by surface roughening before planting to reduce erosion.

02930 - GRASSES

The following section describes the seeding to be conducted under this contract.

02933 - SEEDING

Following completion of seedbed preparation, the Contractor shall seed areas according to the Specifications and as follows:

I. Seeding Time

Seeding shall be accomplished between June 15 and August 31 of each year, unless specific permission in writing is issued by the Project Engineer to allow seeding before or after these dates. Seeding shall not be done when the soil is too wet, too dry, or otherwise untillable as determined by the Project Manager.

II. Seed Species and Mixtures

To assure AML that the seed purchased shall exhibit the characteristics associated with the given variety, and that it is genetically pure, the Contractor shall provide certified seed of named varieties. For the unnamed varieties, the seed shall be obtained by the contractor from the closest available source adapted to the climate and soil. The percentage of each species comprising seed mixtures for application is outlined below. The mixture is to be used for revegetation of areas defined above in Section 02920. Seed species and varieties, which are well adapted to the soil, climate, and topography of the disturbed areas, shall be used in revegetation and are discussed below.

III. Seeding Methods

A. Broadcasting

The seed shall be broadcast. When broadcast seeding, passes shall be made over the site to be seeded such that an even distribution of seed is obtained. Broadcast seeding shall take place immediately following the completion of final soil preparation.

Broadcast seeding shall not be conducted when wind velocities would prohibit even seed distribution as determined by the Project Manager. Broadcast seeding shall be followed by hand raking, manual use of a drag chain, or sweeping with sturdy tree or shrub branches to cover seed.

This shall be done over the entire seeded area but shall not be so extreme as to reduce the extent of soil relief.

Broadcast seeding of large areas shall be done using hand-operated “cyclone-type” mechanical seeders. All seeding equipment used shall be equipped with a metering device and set to the appropriate seeding rate.

Broadcast seeding of small areas of disturbance, less than 0.05 acres (approximately 2500 square feet or 50 feet by 50 feet) may be done by hand scattering and raking to ensure seeds are not exposed on the soil surface.

After completion of the broadcast seeding and seed covering, organic debris such as logs, tree stumps and grubbed vegetation shall be randomly redistributed across the sites. This shall be done at the Project Manager’s direction for the purpose of creating visual variation, ground shading, and production of wildlife habitat. Care shall be taken to avoid leveling the soil surface.

B. Completion

If the Contractor is scheduled to close the project outside the specified seeding time when seeding is the only incomplete item, the Contractor shall complete only seed bed preparation and 75 percent of the lump sum bid price for seeding will be retained. Then the job shall be held open for seeding during the next seeding season with the remainder of the bid price being paid upon completion and acceptance of seeding.

If all of the work required by the contract, except seeding, is completed before seeding is accomplished because of seasonal limitations, partial acceptance of the work will be made with final acceptance delayed until seeding has been accomplished in accordance with these specifications. Liquidated damages will not be assessed against the Contractor during the interim period between the dates of partial acceptance and final acceptance if such delay is the result of seasonal limitations.

C. Seeding Rates

Seeding rates are given in Table III. Pure Live Seed (PLS) expresses seed quality. PLS is a percentage of pure, viable seed in a particular lot of seed. PLS is calculated by multiplying the percent total germination by the percent purity and dividing by one hundred (100):

$$\text{Percent PLS} = \frac{\text{Purity x Germination}}{100}$$

TABLE III
SEED MIX

Class	Plant Species (Common Name/*Scientific Name*)	Pure Live Seed (pounds per acre)
Graminoid	Western Wheatgrass (*Pascopyrum smithii*)	5.60
	Arizona Fescue (Festuca arizonica)	1.60
	Indian Ricegrass (Achnatherum hymenoides)	0.80
	Alkali Sacaton (Sporobolus airoides)	0.20
	Sand Dropseed (Sporobolus cryptandrus)	0.10
	Green Needlegrass (Nassella viridula)	0.76
Forb	Blue Flax (Linum perenne)	0.40
	Western Yarrow (Achillea millefolium var. occidentalis)	0.10
	Rocky Mountain Penstemon (Penstemon strictus)	0.10
	Yellow Prairie Coneflower (Ratibida columnifera)	0.10
	Purple Prairie Clover (Dalea purpureum var. Purpureum)	0.10

All seed shall comply with NMSA 1978, Sections 76-10-11 through -22 and 21.18.4 NMAC, Seed Standards and Classifications. Invoices or bag labels showing purity and germination for all seed shall be provided to the Project Manager before seeding.

The Contractor shall protect and care for seeded areas until final acceptance of the work and shall repair all damage to seeded areas caused by pedestrian or vehicular traffic at no additional cost to EMNRD.

02940 – MULCHING

The Contractor shall apply mulch to all seedbed areas. Mulching will not be permitted when the wind velocity exceeds fifteen miles per hour. The mulch type shall be coarse bark and/or wood chips or chunks, pecan shells, or approved equivalent. Materials shall be wind resistant. No more than 15 percent, by loose volume, shall pass through a 0.25-inch sieve. The mulch shall not contain resin, tannin, or other compounds in quantities that would be detrimental to plant life. Sawdust or materials with noxious seed or plants will not be acceptable. Chipped, but uncomposted, yard waste will not be acceptable unless the material is certified to be free of weed seed. Plant trimmings generated from onsite activities may be shredded and used for mulch; however, deliberately trimming vegetation for the sole purpose of making mulch is not allowed.

The mulch shall be spread uniformly over the prepared area either by hand or with a mechanical mulch spreader. Mulch shall be applied by the Contractor to all seeded areas immediately after seeds are planted to provide suitable surface litter for improvement of moisture conditions and to reduce the potential for damaging erosion or soil blowing which might occur before or during plant establishment.

The rate of application of woody mulch shall be 140 to 160 cubic yards per acre (approximately 1-inch thick after spreading).

02955 – SALVAGE OF NATIVE PLANTS

Before any area is disturbed for access, borrow, fill or other construction activities, the Contractor, accompanied by the AML Project Manager, shall thoroughly scout the area for native plant species. All significant plants shall be marked by the Project Manager and avoided by the Contractor wherever practicable. Of those that need to be disturbed, the Contractor shall salvage those that can be replanted, as the Project Manager directs and as specified below. Species that shall be salvaged include prickly pears (*Opuntia spp.*) and other cactus species, including pincushion types.

Plants to be salvaged shall be dug from the soil before earthmoving operations, preserving as many roots and as much of the soil around the roots as practicable. The south side of the plant and the soil line shall be marked with paint or marking crayons. When transplanted the plant shall be placed in the same orientation it was exposed to before harvesting.

Cactus and other salvaged plants shall be planted as soon as possible but no more than one week after harvest.

Salvaged plants shall be placed into nearby uncompacted native soil, preferably in areas that have been disturbed by construction activities and along closed access roads.

Any transplanted plants shall be watered in at the time of planting; no further watering is required. Larger specimens shall be staked as necessary as determined by the Project Manager.

02990 - SUBMITTALS

Complete data and specifications for the following items shall be submitted in accordance with the procedure set forth in Section 01340:

- Materials:
    - Grout
    - Fill materials
    - Fencing and accessories
    - Signs
    - Signposts
    - Sign fasteners
    - Seed mix
    - Mulch
- Excavation Plan (Section 02222)
- Shop Drawings
    - Signs

END OF DIVISION 2

DIVISION 3 – DRILLING AND GROUTING

03001 – GENERAL REQUIREMENTS

I. Introduction

Drilling and grouting involves the injection of a low-slump, mortar-like grout into encountered void space to form support pillars that contact the mine floor and intact rock above. The grout will not be pushed out to fill all available void space but supports the mine roof by forming a homogeneous grout pillar or cone that contacts intact rock above.

II. Intent

The intent of the compaction grouting specified herein is to:

A. Create pillars in the underground mine workings to support the overlying rock.

B. Provide support and mitigate future subsidence issues along the A-25 road alignment within the limits indicated on the plans.

III. Standards and References

The most recent version of the following testing methods or standards may be employed:

1. ASTM C33 Standard Specification for Concrete Aggregates

2. ASTM C94 Standard Specification for Ready-Mixed Concrete

3. ASTM C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

4. ASTM C1064 Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete

5. ASTM C172 Standard Practice for Sampling Freshly Mixed Concrete

6. ASTM C143 Test Method for Slump of Portland Cement Concrete

7. ASTM C138 Standard Test Method for Density (Unit Weight) and Yield

8. ASTM C31 Standard Practice for Making and Curing Concrete Test Specimens in the Field

9. ASTM C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

10. ASTM C150 Compliance Standard for Portland Cement

11. ASTM C494 Standard Specification for Chemical Admixtures for Concrete

12. ASTM C618 Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

13. ASTM D698 Standard Proctor Compaction Test

Reference documents as provided to the Contractor shall include:

1. Project Specifications.

2. Project drawings.

3. Project site characterization and mitigation recommendations report.

4. Contract documents.

IV. Drilling and Grouting Sequence and Scope

Drilling and grouting work shall be performed as specified in Section 01010. The drilling and grouting tasks are repeated below:

Construct Support Pillars in Mine Workings: Establish support pillars in the encountered mine workings using forty-two (42) drilled boreholes, with a spacing of 10 to 20 feet, on center, near the subsidence features and approximate known mine workings and 30 feet, on center, along the remaining road segments. Drilling will occur along approximately 810 feet of the A-25 road alignment to support the partially collapsed underground mine workings, at approximate depths ranging from 20 to 100 feet below the ground surface. Proposed drill hole locations are shown on Sheets 4 and 5. The goal of the drilling and grouting work is to address the A-25 subsidence features, map voids under the road alignment, and to support those voids with grout pillars to stop additional subsidence and stabilize the road.

The amount of drilled boreholes that are expected to encounter rubble or void space due to the room and pillar design of the mine is unknown at this time due to uncertainty about the exact position and orientation of the mine workings. Boreholes that do not encounter rubble or void space will not require casing or support grout. Approximately 3,000 linear feet of drilling is expected, and approximately 1,400 linear feet of casing will be required for this task. It is estimated that the volume of grout to construct the pillars will be approximately 460 cubic yards (CY) (355 CY + 30% contingency).

Boreholes shall be drilled through the mine workings horizon (as determined by the Engineer at each bore hole location) and five feet into the floor below the workings. Casing shall initially be set three feet above the mine floor of each hole (as determined by the

Engineer) for the initial grout stage. Each grouting stage is considered complete after hitting the pressure cut off, or if determined complete by the Engineer. After grouting the initial stage, the casing will be pulled up three feet for each successive stage; grout stages shall continue to a point when the casing is at least five feet above the mine workings or rubble. When a hole has met the criteria for the completion of grouting, the casing shall be removed, gravity fed grout will be used to backfill the hole to the appropriate depth from surface, and imported base course material shall be used to fill the remaining hole space to restore the hole to appropriate surface conditions. The Contractor shall note that timbers were used to support the mine workings and that pieces of wood may be recovered during drilling. The Contractor shall expect to encounter timbers in various states of degradation. Grouting shall be within the limits indicated on the project plans to meet the acceptance criteria presented in Section 03030 of these Specifications.

In connection with the compaction grouting program, as shown on the drawings, the Contractor shall provide all labor, materials, water and equipment to accomplish the following items of work:

a. Implement ground movement monitoring system.

b. Install and remove grout casing.

c. Furnish and inject support grout.

d. Monitor surface ground movements during grouting operations.

e. Implement site environmental and safety controls including grout contact, flush and wastewater runoff controls.

V.

03010 – DRILLING EQUIPMENT

I. Drilling Equipment

A. The Contractor shall supply drilling equipment capable of drilling efficiently through various subsurface conditions to the depths necessary to meet the project objectives. The drilling equipment must be capable of drilling to a minimum depth of 200 feet. The drilling equipment shall be capable of air rotary drilling or another method approved by the Project Engineer.

B. The drilling equipment must be capable of drilling holes with a large enough diameter to accommodate the necessary grout casing. The hole diameter must allow for the installation and lifting of casing with relative ease.

C. Any alluvial casing used shall be of a large enough diameter to accommodate the

necessary grout casing.

D. The drilling equipment used shall be capable of returning cuttings by air circulation at 5-foot increments.

E. The Contractor shall keep enough drill steel on site to avoid slowing down operations should some drill steel be lost downhole.

03020 – GROUTING EQUIPMENT AND MATERIALS

I. Grouting Equipment

A. The Contractor shall supply equipment capable of advancing the grout casing to the specified depth or as required to meet the project objectives.

B. The Contractor shall supply all equipment required to operate a grouting system capable of supplying the specified grout at variable pressures, measured at the pump, up to 400 psi (2758 kPa) and at rates of 0.5 to 9 cubic feet (0 to 0.25 cubic meters) per minute, as required to suit the application.

C. The mixer shall be a continuous auger type to ensure complete uniform mixing of the materials used and shall be of sufficient capacity to continuously provide the pumping unit with mixed grout at its normal pumping rate. The mixer must be capable of volumetrically proportioning the grout materials. Ready mixed grout is also acceptable with an approved mix design.

D. The Contractor shall provide gauges or other instrumentation (measuring devices) to continuously measure and record:

1. Grout pressure at or close to the top of the injection casing.

2. Flow rate of grout.

3. Volume of grout injected.

E. The Contractor shall supply and implement ground surface movement monitoring equipment whenever grouting is taking place.

F. An adequate communication system shall be maintained between the pumping and batching plant and the injection location.

II. Casing

A. Casing and connections shall be steel casing of adequate strength to maintain the hole and to withstand the required jacking and pumping pressures. The casing shall

be at least 2.0 inches (50 mm) inside diameter in order to adequately handle the specified low slump material without plugging. All casing shall be flush joint threaded or a single piece tubing to provide a smooth inner wall and unobstructed inside diameter. It shall be the Contractor's responsibility to install casing that does not detrimentally impact the grouting procedure.

B. The Contractor shall keep enough casing on site to avoid slowing down operations should some be lost downhole.

C. Casing shall be installed such that grout material will not travel in the annulus area between the casing and adjacent ground and escape at the surface when pumped.

III. Grout Materials

A. Portland Cement (ASTM C150)

B. Fine aggregate shall be sand with a fines content (percent passing No. 200 sieve) of not less than 10 percent and not more than 30 percent. Natural fines may be supplemented with fly/ash, slag cement, bentonite, or aggregate washings.

C. Proportions of the mixture shall be required to achieve a pumpable mix with not less than 3 inch and not more than 6 inch (75 to 150 mm) slump with a 0 percent bleed, and a stiffening time of greater than four hours. The requested slump shall be determined by the Engineer for each individual grout bore hole based on the downhole conditions. Open void space shall use a lower slump, down to 3 inch, and rubble shall use a higher slump, up to 6 inch.

D. The 28-day compressive strength of the grout will not be less than 1,000 psi (6895 kPa).

E. Upon discharge into the pump hopper or holding tank, the grout must be continuously agitated. Mixed grout may not be held in the agitator for more than 1.5 hours unless a set retarder, approved by the AML Program's representative, is used.

F. The Contractor shall not use grout for injection as support grout if more than 2 hours have passed since it was batched (or since water was mixed in with cement).

03030 – EXECUTION

I. Site Examination and Schedule

A. Prior to submitting a bid price for the compaction grouting, the Contractor shall conduct a site inspection.

II. Drilling

A. The plans show drill hole spacing at approximately every 10 feet, every 20 feet, or every 30 feet by zone depending on the existing subsidence area, and existing mine map (Sheet 4). The drill hole spacing shown on the plans may be adjusted by the Engineer based on the subsurface conditions encountered. The Engineer may adjust the boring locations to better predict void spaces based on how the void findings correspond to the mine map. The Engineer may adjust the boring locations to ensure adequate protection of the active subsidence area. Drill hole locations may be added or eliminated.

B. If the material encountered at the surface before bedrock may slough into the hole, the Contractor shall use alluvial casing to the necessary depth to keep the hole open. This will be considered alluvial drilling and the length of alluvial drilling is determined by the length of alluvial casing installed. Alluvial casing shall not be installed in bedrock. If the Contractor is unable to remove alluvial casing from a hole it shall be cut off at least 18 inches below the surface before the hole receives a surface restoration.

C. The Contractor shall provide cuttings samples via air return at 5-foot increments from the ground surface through the full depth of the hole, or until circulation is lost. Every effort should be made to ensure that the cuttings samples are representative of the 5-foot increment they are collected for.

D. The downhole conditions encountered by drill holes shall be categorized by the Engineer as:

1. Abandoned – the drill hole was not drilled to completion.

2. Pillar – the drill hole encountered an intact section of the target coal seam.

3. Void fill – the drill hole encountered rubble or open void space.

    a. Drill holes categorized as void fill will require support grout.

E. The Contractor shall drill a minimum of 5 feet below the mine floor for each hole as called by the Engineer.

F. The Contractor's experienced driller will be asked to provide their opinion on the depth to the mine floor, as well as their opinion on the depth to rubble, void space, and/or the top of the coal seam as it applies to each hole drilled. Driller calls should be based on the driller's experience and perceived transitions between the general subsurface conditions, lower resistance material like coal, irregular rubble zones, and open void space. The drilling rate, cuttings encountered, and continued return of cuttings throughout the hole will also be considered by the on-site engineer when evaluating drill holes.

G. The Contractor shall provide a drill hole cover for each completed hole. A cover will remain in place over any open hole whenever possible until the hole is backfilled.

III. Grouting

A. The Contractor shall inject support grout for holes categorized as void fill by the Engineer.

B. The support grout shall be injected at a stage depth until one of the following occurs (adjustments to criteria 1 and 2 can be submitted for consideration in the Contractor's work plan):

1. The header pressure reaches a reading of 400 psi (2758 kPa) if the depth to injection is 45 feet or greater, 275 psi (1896 kPa) if the depth is between 45 feet and 35 feet, or 250 psi (1724 kPa) if the depth to injection is 35 feet or less.

2. 20 CY of support grout has been injected at that stage depth.

3. Measurable surface ground heave is observed (i.e., displacement of ground surface of greater than 1/8 inch during a grout stage or a maximum cumulative heave of 1 inch).

4. Grout is returned up the annulus.

If criteria 2 or 3 is met, grouting for the hole is considered complete. If the grouting stage completed is 5 or more feet over the top of mine workings or rubble, grouting for the hole is considered complete. If the disturbance, open void, or rubble zone, reaches the surface, as with the subsidence features, the grouting stages will continue until the hole is considered complete by meeting refusal criteria 2 or 3, if the on-site engineer considers the hole completed, or if the last injection stage depth completed is within 5 feet of the surface.

C. If, for any reason, the Contractor is unable to complete support grouting for a hole before that hole is considered complete by meeting the refusal criteria or by the determination of the Engineer, the hole will be offset by 5 to 10 feet as directed by the on-site engineer and re-drilled.

D. A ground movement monitoring system must be in place for each hole requiring support grout for the duration of grout injection. The ground movement monitoring system shall be a laser level system with at least 3 reflectors accurate to a hundredth of a foot (0.01 feet) and all stations within 50 feet of the injection point, or a different system approved by the Engineer. The Contractor shall additionally visually monitor the area for any signs of ground heave.

E. The Contractor shall ensure the implementation operation of measuring and recording equipment for the duration of grout injection at each hole requiring the support grout. The equipment must accurately measure and record real time data for the grout pressure at or near the wellhead, the flow rate of grout, and the total volume of grout injected per hole.

F. Grouting will not take place within 10 feet of locations grouted within the previous 12 hours.

G. For those drilling and grouting locations with 10 feet of spacing, drilling and grouting should be completed every other planned borehole during the course of one workday. Those planned boreholes that are skipped shall be completed the following day.

H. As support grouting is completed at each location, the Contractor shall backfill the hole with grout. All boreholes, including those that did not encounter void space and therefore did not require support grout, shall be backfilled with grout. Grout used as backfill may be gravity fed without casing.

I. Surface restorations for each hole will be determined based on the surrounding road surface conditions. If the road surface is bedrock, the Contractor shall backfill the holes with grout to 4 inches from the ground surface and backfill and compact the remaining 4 inches with appropriate base course material up to the ground surface. If the road surface is gravel, the Contractor shall backfill the holes with grout to within 18 inches and up to 4 inches below the ground surface and backfill and compact the remaining distance to ground surface, a maximum of 18 inches and a minimum of 4 inches, with appropriate base course material up to the ground surface.

B. The location of boreholes will be recorded with global positioning satellite (GPS) survey equipment capable of sub-meter accuracy by the AML Program's representative.

IV. Field Quality Control

A. All support grouting shall be performed under the inspection of the Field Quality Control Representative (FQCR). The FQCR shall by designated by EMNRD.

1. The FQCR shall be certified as a Concrete Field Testing Technician – Grade I through the American Concrete Institute.

B. Monitoring and logging of support grouting operations for the production work shall be done by the FQCR. Logging shall include completing grouting field forms, recording materials test results, and any field notes.

C. The FQCR will follow standard sampling procedures and perform standard temperature, slump, and unit weight tests to verify the Contractor's grout mix, as follows:

1. Temperature, slump, and unit weight tests will be performed:

a. at any change in mix design, or

b. at least once during each grout shift, or

c. once for every 100 cubic yards of grout injected

2. Grout mix proportions and the calculated yield will be checked at least once daily.

D. The FQCR will follow standard test specimen preparation standards to cast size 4-inch by 8-inch (100 mm by 200 mm) grout test cylinders for strength testing. One set of five cylinders or molds will be cast for each day of grouting operations.

1. Only one set of specimens is required in a day, even if more than 100 cubic yards of grout is injected that day.

2. Test specimens will be stored, collected, and cured in accordance with standard test specimen preparation standards, including all handling by the FQCR and testing facility.

3. Compressive strength testing will be completed in accordance with the standard testing methods.

a. Of the test specimens prepared, three will be tested at 28-days for an average compressive strength result, and two will be tested at 7-days for an average compressive strength result.

E. As detailed in Section 03990, daily records shall be maintained by the Contractor and submitted to the AML Program's representative.

F. The Contractor shall monitor open and connected holes for the flow of grout if any are available. If the FQCR observes a significant quantity of grout is leaking outside of the grouting area, the Contractor may be asked to stop pumping and allow the grout to set up. Before resuming pumping, the grout may need to be thickened and/or have a reduced setup time.

G. After completion of the grouting program, the monitoring system and grout casing will be removed, and all holes will be backfilled and receive an appropriate surface restoration.

V. Testing and Inspection

A. Ground level monitoring and logging of pressure, flow rate, and volume for grouting operations for production work shall be done by the Contractor and The Contractor shall supply all equipment necessary for ground level monitoring and real-time logging of the grouting operations. The monitoring and logging will be observed and documented by the FQCR.

B. Grout material testing shall be completed by the FQCR. Material testing results will be made available to all parties on site at the completion of the tests.

VI. Restrictions

A. The Contractor shall be responsible for obtaining any State and municipal permits (if required) and conforming to all State and local regulations.

B. The Contractor shall avoid all cultural and biological resources designated by AML cultural resources staff including those discovered during construction. The Contractor shall avoid these areas with all equipment, vehicles, foot traffic, and any other ground surface disturbing activities.

C. The Contractor will be responsible for the delineation of all above and below ground utilities and obstructions.

D. The Contractor shall be responsible for the disposal of all waste materials generated during construction; including, but not limited to, drill cuttings, grout waste, and wash water.

E. The contractor shall be responsible for protecting and preserving borehole location markers throughout the drilling and grouting activities until the holes have both received surface restorations and their locations have been recorded by the on-site engineer.

F. The Contractor shall take reasonable measures to avoid traffic conflicts between vehicles of the Contractor's employees and private citizens and to avoid overloading of any driveways, roads and streets. The Contractor shall limit the access of equipment and trucks to the project site and provide protection for any improvements over which trucks and equipment must pass to reach the job site.

G. Hours of construction shall be between 7:00 AM and 7:00 PM.

03990 – SUBMITTALS

The following shall be submitted to the eProNM by the Contractor with the bid documents:

1. A list of at least two previously completed mine subsidence/backfill projects of similar scope within the last 5 years. The list shall include a description of the project, relative size, and contact person with phone number. This is for information only and not to be used to qualify bidders bidding an ITB which is based on the l owest cost.

The following shall be submitted to the Project Engineer by the Contractor two (2) weeks prior to the start of work:

1. Resumes of the management, supervisory, and key personnel, for approval by the Project Engineer.

2. A ground movement monitoring plan, as detailed in Section 03020 of these Specifications.

3. A real-time grout pump monitoring and logging plan, as detailed in Section 03020 of these Specifications.

4. A mix design for the project indicating sources and types of grout materials, with volumetric proportions, and field test data from previous projects indicating compressive strength, and slump of 3 to 6 inches (75 to 150 mm) achieved. If the Contractor intends to deviate from the gradation provided in Section 03020 of this specification, it shall submit, with the bid, evidence of satisfactory use of the proposed material from past projects with similar conditions.

5. Work procedures and control criteria (including volumes and pressure for each stage).

6. A general Work Procedures Plan outlining the spacing, location, depth and quantity of grout to achieve the specified criteria detailed in Section 03030 of this specification.

The following shall be submitted to the AML Program's representative by the Contractor during the work:

1. Accurate daily records of weather conditions, all hours worked, drilling footage, drill hole categorizations, grout casing installation, grouting quantities, including stage data, volume, pressure and depth for each grout location.

2. A weekly summary of work completed and construction progress, QA/QC activities and test results, problems and resolutions, meetings and discussions held, incidents/accidents/health and safety issues, and construction cost estimate.

3. Any change in the predetermined drilling or grouting program necessitated by a change in the subsurface conditions.

Submittals shall be made in accordance with the procedure set forth in Section 01340.

END OF DIVISION 3

ATTACHMENT 1
DESIGN DRAWINGS