Horse Canyon Extension
Lila Canyon Mine

Chapter 5
Engineering

Volume 4 of 7
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500. ENGINEERING

510. Introduction

This section presents the engineering portion for the Lila Canyon Extension to the Horse Canyon Mine Reclamation Plan and is based upon previous publications, permit applications for the adjacent Sunnyside and South Lease areas and design which follows basic engineering standards. The objective of this chapter is to provide sufficient engineering design to support the mining and reclamation plan for the Lila Canyon Mine (ACT/007/013) and to satisfy the rules found in R645-301-500. All of the activities associated with the coal mining and reclamation operations are designed, located, constructed, maintained, and reclaimed in accordance with the operation and reclamation plan. The engineering section of the permit application is divided into the introduction, the operation plan, operational design criteria, reclamation plan, and performance standards. All design criteria associated with the operation and reclamation plans have been met.

511. General Requirements.

511.100 The permit application includes a description of the proposed coal mining and reclamation operations with appropriate maps, plans, and cross sections.

511.200 A description of the proposed mining operation and its potential impacts to the environment as well methods and calculations utilized to achieve compliance with design criteria are addressed within this chapter.

511.300 A description of the proposed reclamation plan is included in this chapter.

512. Certification

512.100 Cross Sections and Maps that require certification have been prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, with assistance from experts in related fields when needed. Cross Sections and Maps will be updated as needed or required by the Division. Listed below are some of the maps and cross sections that have been certified by a qualified registered professional engineer.

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Div. of Oil, Gas & Mining
512.110. A map showing the extent of known existing mine workings and the approximate year mined has been included and certified by a qualified registered professional engineer and included as Plate 5-1.

512.120. All Surface facilities (temporary and long-term) and operations are shown on the appropriate maps, and have been certified by a qualified registered professional engineer.

512.130 Maps showing final surface configuration with cross sections have been included and certified by a qualified registered professional engineer. (See Plate 5-6, 5-7c, and Appendix 5-4)

512.140 Appropriate hydrology drawings and cross sections have been certified by a qualified registered professional engineer. (See Chapter 7)

512.150 Geologic cross sections and maps that are required to be certified, have been certified by a qualified registered professional engineer. See Chapter 6 and Plate 7-1B.

512.200 Plans and Engineering Designs which may include: Excess spoil piles, durable rock fills, coal mine waste, impoundments, primary roads and variances from approximate original contour. These Plans and Designs have been certified by a qualified registered professional engineer if appropriate.

512.210 Lila Canyon Mine is an underground operation, therefore it is anticipated that no excess Spoil will be produced. This section does not apply.

512.220 The professional engineer experienced in the design of earth and rock fills has certified that the durable rock fill design will ensure the stability of the fill and that the fill meets design requirements.
The professional engineer experienced in the design of coal mine waste piles has certified the design of the coal mine waste disposal facility. (See Appendix 5-7)

Prudent engineering practices are used in the design and construction of impoundments in the permit area. The impoundment designs have been certified by a qualified registered professional engineer. (See Plates 7-6a and 7-6b)

The professional engineer has certified the design and construction or reconstruction of primary roads as meeting the appropriate design criteria.

The operator is not requesting a variance from the approximate original contours (AOC).

513. Compliance With MSHA Regulations and MSHA Approvals.

Neither Coal processing waste dams nor embankments are anticipated during the term of this permit. Therefore, this section is not applicable.

Planned impoundments and sedimentation ponds do not meet the size or other qualifying criteria of MSHA, 30 CFR 77.216(a). Therefore, this section is not applicable.

Underground development waste transported to the surface, coal processing waste and excess spoil will not be disposed of underground. However, material such as overcast material, rock falls, and slope material, not transported to the surface, may be disposed of underground according to the appropriate MSHA regulations.

Refuse piles meet the requirements of MSHA, 30 CFR 77.214 and 30 CFR 77.215 and all appropriate R645 regulations. (See Appendix 5-7)

Shafts, drifts, adits, tunnels, exploratory holes, entryways or other opening to the surface from the underground will be disposed of underground according to the appropriate MSHA regulations.
capped, sealed, backfilled or otherwise properly managed consistent with MSHA, 30 CFR 75.1711.

513.600 Surface water discharges into the underground mine workings is not anticipated or planned. Therefore, this section is not applicable.

513.700 Surface mining within 500 feet to an active underground mine is not planned nor anticipated. Therefore, this section does not apply.

513.800 Coal mine waste fires plans will be submitted to MSHA and the Division for their approval prior to extinguishing any coal mine waste fires. (See Appendix 5-3)

514. Inspections

All engineering inspections, except the quarterly inspections of impoundments not subject to MSHA, will be conducted by a qualified registered professional engineer or other qualified professional specialist under the direction of the professional engineer.

514.100 Lila Canyon is an underground operation and it is not anticipated that any spoil will be produced. Therefore, this section does not apply.

514.200 Refuse Piles. A professional engineer or specialist experienced in the construction of similar earth and waste structures will inspect the refuse pile during construction.

514.210 Regular inspections by the engineer or specialist will also be conducted during placement and compaction of coal mine waste materials. If it has been determined that a danger of harm exists to the public health and safety or the environment, more frequent inspections will be conducted. Inspections will continue until the refuse pile has been finally graded and revegetated or until a later time as required by the Division.

514.220 The refuse pile inspections will be performed at least quarterly throughout construction and during the following construction periods:
514.221 In addition to quarterly inspections, an inspection will be performed during foundation preparation which includes the removal of all organic material and topsoil;

514.222 Since no under-drain or protective filter systems are planned, this section is not applicable.

514.223 In addition to quarterly inspections, an inspection will be performed during the installation of the final surface drainage systems.

514.224 In addition to quarterly inspections, an inspection will be performed after the final grading and the facility has been revegetated.

514.230 The division will be provided a certified report prepared by, or under the supervision of, the qualified registered professional engineer after each inspection. The report will certify that the refuse pile has been constructed and maintained as designed and in accordance with the approved plan and R645 Rules. This report will include statements stating the appearances of instability, structural weakness, and other hazardous conditions if found. (See Appendix 5-1)

514.240 Since protective filters and under-drain are not required in the current design criteria this section is not applicable.

514.250 Required refuse pile reports will be retained at or near the mine site in an area convenient to the resident agent and the qualified registered professional engineer. Appendix 5-1 is an example of the refuse pile inspection form.

514.300 Impoundments

514.310 A professional engineer or specialist experienced in the construction of impoundments will inspect impoundments.
514.311 During construction, inspections will be made on a regular basis, and upon completion of the ponds. The inspections will be performed at least yearly. Inspections will continue yearly until the pond is removed or the performance bond is released.

514.312 After each inspection the qualified registered professional engineer will promptly provide to the Division a certified report. This report will state that the impoundment has or has not been constructed and maintained as designed and in accordance with the approved plan and the R645 Rules. The report will include a discussion of any appearances of instability, structural weakness or other hazardous conditions. All so included in the report will be the depth and elevation of any impounded waters, existing storage capacity, any existing or required monitoring procedures and instrumentation and any other aspects of the structure affecting stability.

514.313 Required impoundment inspection reports will be retained at or near the mine site in an area convenient to the resident agent and the qualified registered professional engineer. Appendix 5-2 is an example of the impoundment inspection form.

514.320 Since the pond contained in the Lila Canyon Project is less than 20 feet high and stores less than 20 acre-feet of water, it is not subject to MSHA, 30 CFR 77.216. Therefore, this section does not apply.

515. Reporting and Emergency Procedures.

515.100 If a slide occurs, the operator will telephone DOGM to notify them of the situation and recommend remedial measures to be taken to alleviate the problem. Additional remedial measures required by DOGM will be implemented.
515.200 During impoundment inspections, any potential hazards noted will be reported to DOGM, along with measures to be implemented to eliminate the hazard.

515.300 In the case of temporary cessation of operations the following will apply:

515.310 All provisions of the approved permit will be complied with during temporary cessation or abandonment.

515.311 In case of temporary cessation, the operator will support and maintain all surface access openings to underground operations, and secure surface facilities in areas in which there are no current operations, but operations are to be resumed under an approved permit.

515.312 Since Lila Canyon Mine is an underground operation, this section does not apply.

515.320 Prior to a temporary cessation of coal mining and reclamation operations which is expected to last longer than 30 days, or when a temporary cessation is extended longer than 30 days, the operator will submit to the Division a notice of intention to cease or abandon operations. The following will be included in the notice of temporary cessation.

515.321 The temporary cessation notice will contain the exact number of surface acres and the horizontal and vertical extent of subsurface strata included in the permit area. In addition, a description of the reclamation activities accomplished and activities such as backfilling, regrading, revegetation, environmental monitoring, underground opening closures and water treatment activities that will continue during the temporary cessation.

515.322 Since the Lila Canyon Mine is an underground operation, this section does not apply.
516. **Prevention of Slides**: Since the Lila Canyon Mine is an underground operation, this section does not apply.

520. **Operation Plan.**

At first glance it would appear to a non-mining person that the best access to UEI's leases would be from the existing (sealed) Horse Canyon portals using the current Horse Canyon surface disturbance. However, the existing Horse Canyon site is not suitable for a large longwall operation. The old Horse Canyon Mine was not designed to produce 4.5 million tons as will be Lila. Some strategic pillars in the old mains were extracted upon retreat preventing any future access. The number of entries in the old works is not adequate for ventilation purposes. Portions of the old mine are flooded preventing reentry. The distance from the old portals to the current leases would result in unacceptable travel times for crews and supplies. Rehabilitating and maintaining an old mine is extremely hazardous and expensive. As a result of the conditions described above it has been determined that new portals at the Lila Canyon site are the most logical and only feasible access to the permittee's coal leases.

**Lila Canyon Current Temporary / Long-term Mine Facilities List**

Current temporary and long-term structures and facilities are shown on Plate 5-2. The Keyed Mine Facilities from Plate 5-2 are numbered as follows:

**Buildings**

1) Temporary Bath House  
2) Temporary Office Trailer  
3) Temporary Office / Shop Building  
4) Temporary Storage Shed (Wooden)  
5) Temporary Storage Building (Metal)  
7) Temporary Office Building  
9) Temporary Storage Tent with concrete floor  
22) Temporary Crusher/Screen Building  
33) Shop / Warehouse Building

**Utilities**

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37) Non-Potable Water Storage Tanks
40) Concrete Electrical Junction Box
41) Temporary Concrete Septic Tank

**Mine Facilities**

14) Rock Dust Silo
16) Temporary Underground Reclaim Room
17) Temporary Concrete Retaining Wall
18) Temporary Loadout Conveyor (48")
19) Temporary Loadout MCC Building
20) Temporary Loadout Structure
21) Temporary Crusher Conveyor (48")
23) Temporary Crushed Coal Conveyor (48")
24) Temporary Crusher MCC Building
25) Temporary Concrete Dozer Trap
27) Temporary Concrete Equipment Pad
30) Existing ROM Coal Conveyor from Underground (60")
31) Steel Portal Canopy Structure
32) Concrete Conveyor Bay at Belt Portal
34) Mine MCC Building / Electrical Tower
35) Backup Ventilation Fans
36) Main Mine Ventilation Fan / Electrical Tower
39) Chain Link Fencing
43) Temporary Conveyor Counterweight Structure
44) Jersey Barrier Guard Rails
45) Concrete Trash Chute
46) Gantry Lift Assembly

**Support Facilities**

No Number Mine Facilities Access Road / Truck Loadout Road
No Number Rock Slopes
No Number Sediment Ponds
No Number Slope Access Road / Portal Access Road
No Number New Storage Pad
No Number New Storage Pad Access Road
No Number New Storage Pad Service Road
No Number Topsoil Pile
6) Temporary Concrete Walkway
15) Temporary Fuel Storage Tanks
29) Sediment Pond Spillway Structure
42) Temporary Loadout Light Board
38) Powder and Cap Magazines

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A description of current temporary and long-term structures and facilities:

**BUILDINGS**

1) **Temporary Bath House**

The temporary bath house is shown on Plate 5-2. This complex is made up of interconnected portable structures (trailers and metal intermodal structures) and a concrete and wood-framed shower area. Shower and toilet facilities for all male employees are at this location. Female employees utilize a separate, nearby temporary trailer for showers and toilet facilities (see #2 below). The bath house provides a location for underground miners to change from clean street clothes to clothing suitable for underground use. The area provides showers for employees for use after their scheduled work shifts so they can clean up prior to returning home. The trailers and metal intermodal structures rest upon stacked concrete blocks for stability and leveling purposes. Once the long-term bath house (per Plate 8-1) is constructed, the temporary bath house and all supporting structures will be removed.

2) **Temporary Office Trailer**

The temporary office trailers are prefabricated, self-contained, modular trailers, similar to those often seen on construction sites. The trailers can be moved using a vehicle with a tow hitch. Each trailer typically contains two (2) or three (3) offices and one (1) restroom. Each trailer is equipped with a waste water storage tank for the rest room. The waste water storage tank is emptied on a regular basis. One (1) temporary office trailer has been modified to provide shower and toilet facilities for female employees similarly to the temporary bath house (see #1 above). The office trailers are used by mine personnel in support positions to mine operations. Multiple trailers are currently used. The locations of these trailers are shown on Plate 5-2. Once long-term office areas are constructed, the temporary office trailers and all supporting structures will be removed.

3) **Temporary Office / Shop Building**

The Temporary Office / Shop Building is shown on Plate 5-2. The building is a prefabricated metal building on a concrete foundation system, with a 4" thick concrete floor slab. The building is split down the middle width-wise with one side being the shop area, and the other office space for mine personnel in support positions to mine operations. The shop area is used to
perform minor equipment repairs. The building measures approximately 30' by 62'. Once long-term offices and the long-term Shop/Warehouse have been constructed, the temporary office / shop building will be razed.

4) Temporary Storage Shed (Wooden)
The temporary wooden storage shed measures approximately 10' by 20' by 8' high, with a wooden floor structure. The shed is used to store various equipment and supplies needed for mine operations. Multiple sheds are currently used. The locations of these sheds are shown on Plate 5-2. Once the long-term Shop/Warehouse has been constructed, the temporary storage sheds will be removed.

5) Temporary Storage Building (Metal)
The temporary metal storage building is a prefabricated, metal, intermodal container used for storage. These structures are sometimes referred to as “conex containers.” The containers are typically 20' to 40' long by 8’ wide by 8.5' high. These structures are used to store various equipment and supplies needed for mine operations. The metal storage structures typically provide a higher level of security than do wooden sheds. Multiple metal storage buildings are currently used. The locations of these buildings are shown on Plate 5-2. Once the long-term Shop/Warehouse has been constructed, the temporary storage buildings will be removed.

7) Temporary Office Building
The temporary office / storage building is shown on Plate 5-2. The office space is used by mine personnel in support positions to mine operations. The building measures 20' by 12' by 10' high. The building is a wood frame on a concrete foundation. The floor is a 4" thick concrete slab. Once the long-term office areas and Shop/Warehouse have been constructed, the temporary office building will be razed.

9) Temporary Storage Tent with Concrete Floor
The temporary storage tent is constructed of an arched metal wall/roof structure covered with a canvas overlay. The tent rests on a 6" concrete floor slab. Two tents are currently in use at the mine site. One tent measures 30' by 30'. The other measures 70' by 48'. The tents are used to store large wares and supplies needed for mining operations that need some protection from the weather. The temporary storage tents with concrete floors are shown on Plate 5-2. Once the long-term Shop/Warehouse has been constructed, the temporary storage tents and associated concrete floor slabs will be removed.
22) Temporary Crusher / Screen Building
The temporary crusher / screen building is shown on Plate 5-2, and houses the screen and crusher assemblies. The screen assembly sorts the coal as it enters the building, via the temporary crusher conveyor (see #21 below), between the larger lump sizes that need to be crushed (2"-8" in size) and the smaller nuggets that do not need to be crushed (less than 2" in size). The crusher assembly reduces the larger 2" to 8" sized coal lumps to nuggets measuring less than 2" in size. The coal that is now 2" or less in size falls onto the crushed coal conveyor (see #23 below) and exits the building. The building itself is constructed of a wide flange steel frame and rests on a 12" thick monolithic concrete slab base. The building measures approximately 48' by 22', and stands approximately 58' at its peak. The temporary crusher / screen building has been constructed to meet MSHA regulations. Once the long-term coal handling facilities have been constructed, the temporary crusher / screen building will be razed.

33) Shop / Warehouse Building
The shop / warehouse building is shown on Plate 5-2 and 8-1. This building will be a long-term structure used to repair machinery and vehicles associated with mine operations, and shall store various wares associated with mine operations. The building will be 120 feet long by 60 feet deep. The roof will be sloped for drainage. The facility will be approximately 36 feet high at the peak of the roof. The building will be constructed of a poured concrete footing and foundation system and floor. The walls and roof will be of pre-fabricated steel. Several roll-up type overhead doors will allow vehicles to enter the building for repair and maintenance. One bay will have overhead doors on the front and rear of the building to allow trucks to enter the building on one side, load or off load wares or equipment, then exit the building through the opposite side of the structure. The building will also house a large capacity overhead crane that will be used to lift heavy objects and equipment. This structure will remain throughout the life of the mine, and will be removed at the time of final reclamation.

UTILITIES

Mine Substation
The mine substation is shown on Plate 5-2, and provides power to surface and underground areas of the mine property. The substation includes approximately four transformers setting on a concrete pad approximately 20' by 20' by 12" and fully fenced. The total fenced area of the substation is approximately 215' by 112'. Power is fed into the transformers at 138 KVA and will be transformed down to usable voltages for both the surface and underground facilities. It is anticipated that voltages of 110V, 220V, 440V will be used on the surface, and 2,470 volts will be
utilized underground. The mine substation is constructed to fulfill all appropriate MSHA regulations. The Mine Substation will remain throughout the life of the mine, and will be removed during final reclamation.

8) Potable Water Tanks
The potable water tanks are shown on Plate 5-2. Potable water is purchased off-site and is transported to the mine site via tanker truck, which in turn fills the tanks. The potable water is stored in one 15' diameter by 20' high metal tank and two (2) 20' by 8' by 8' high conex-type cubic tanks. Water from these tanks are used for toilets and showering in the temporary bath house (see #1 above). The round tank is set on a 15' by 15' concrete pad designed for adequate support of the tank. The cubic tanks are self-contained and rest on native soil. The location of the potable water tanks can be found on Plate 5-2. The potable water tanks will remain throughout the life of the mine, and will be removed during final reclamation.

10) Power Poles
Multiple wooden power poles are utilized throughout the disturbed area. Locations of power poles are shown on Plate 5-2. The power poles are large, upright wooden poles used to support overhead power transmission lines and other wires as needed. The power poles will remain throughout the life of the mine and will be removed during final reclamation.

11) Electrical Transformer
An electrical transformer is used to adjust and transfer electrical energy in electric power applications. Each transformer rests on a 4" thick concrete slab of suitable size to support the weight of the transformer. The transformer feeds various mine facilities. Multiple transformers are currently utilized. Their locations are shown on Plate 5-2. Transformers will be removed as their respective temporary facilities are removed and replaced upon the completion of long-term facilities (see Plate 8-1).

12) Overhead Power Transmission Lines
Within the disturbed area, both overhead and underground power lines will be utilized. Overhead power lines will be run where underground power lines are not feasible. Vertical power poles (see #10 above) support the overhead lines to provide adequate and safe clearances below the power transmission lines. The overhead power transmission lines have been spaced to protect raptors. As-built drawings will be provided upon completion of the long-term surface facilities. Overhead power lines will be remain through the life of the mine, and will be removed upon final reclamation.

13) Buried Power Transmission Lines
Within the disturbed area both overhead and buried power lines will be utilized.
Buried power transmission lines will be run where feasible. All buried power transmission lines will be run in conduits. As-built drawings will be provided upon completion of the long-term surface facilities. Long-term underground power lines will remain throughout the life of the mine. Upon final reclamation, the long-term underground power transmission lines will be abandoned and left in place.

28) Electrical Grounding Field
The electrical grounding field is composed of a grounding grid and rods buried below the soil. The electrical grounding field has been designed and constructed to meet MSHA requirements and regulations. It is used to ground the Mine Substation (see above). The location of the electrical grounding field is shown on Plate 5-2. The electrical grounding field will remain throughout the life of the mine, and will be removed during final reclamation.

37) Non-Potable Water Storage Tanks
Three non-potable water storage tanks are used to store water for mine-related purposes including dust suppression on roadways and other points as required by the approved Air Quality Order. The location of the non-potable water storage tanks is shown on Plate 5-2. The non-potable water storage tanks will remain throughout the life of the mine, and will be removed upon final reclamation.

40) Concrete Electrical Junction Box
The location of the concrete electrical junction box is shown on Plate 5-2. The concrete electrical junction box is a buried 6' by 6' by 6' concrete box with 6" thick walls, top and floor. A steel manhole allows access to the interior of the box. Within the junction box, high-voltage connections are made that allow power to be transferred from the Mine Substation to the overhead power lines. The concrete electrical junction box will remain throughout the life of the mine, and will be removed upon final reclamation.

41) Temporary Concrete Septic Tank
The temporary concrete septic tank facilitates the existing employees working on rotating shifts. The tanks are used in conjunction with the tanks that are a part of the bath house trailer (see #1 above) and other temporary office trailers (see #2 above). The tanks will be pumped out regularly. Multiple tanks are currently used. The locations of these tanks are shown on Plate 5-2. The temporary concrete septic tanks will be removed upon the completion of the long-term office areas and long-term bath house facilities.
MINE FACILITIES

14) Rock Dust Silo
The Rock Dust Silo is a tower silo used to store bulk rock dust for use within the mine. Rock dust is used to reduce the combustible fraction of coal dust in the air within the mine. The silo is constructed of a steel container supported by a steel frame on a concrete foundation with a 6" thick concrete pad and apron. The rock dust silo will remain throughout the life of the mine, and will be removed during final reclamation.

16) Temporary Underground Reclaim Room
The temporary underground reclaim rooms form a portion of the temporary coal handling facilities for the mine. The reclaim rooms are buried concrete and steel structures, measuring approximately 20' by 17' by 17' high. The floor, roof, and all walls, except one (1) wall, are constructed of steel reinforced concrete. The remaining wall is constructed of plate steel and steel angles, with an opening for a tubed conveyor structure. The roof of the structure has an opening and gate that allows coal to fall from the bottom of the stockpile above onto a conveyor belt for transportation to either the Crusher Building or Loadout Structure. Two (2) temporary underground reclaim rooms are currently in use. These structures are shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the rooms will be filled with rocks and other backfill material, then left in-place after final reclamation.

17) Temporary Concrete Retaining Walls
The temporary concrete retaining walls form a portion of the temporary coal handling facilities for the mine. The walls are constructed of steel reinforced concrete, and provide support for conveyor assemblies emanating from the temporary underground reclaim rooms (see #16 above), and prevent coal stockpiles from encroaching into unwanted areas. Two (2) temporary concrete retaining walls are currently in use. Steel wide-flange posts will be embedded into the concrete wall, extending up from the retaining walls adjoining the concrete dozer trap (see #25 below) in the event that more coal storage capacity is required above the dozer trap. In this event, steel plates will be welded to the steel posts to extend the height of the retaining wall in this area. These structures are shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary concrete retaining walls will be razed.

18) Temporary Loadout Conveyors (48")
The temporary loadout conveyors are a portion of the temporary coal handling facilities for the mine. The temporary loadout conveyors move
crushed coal from the temporary underground reclaim room (see #16 above) and concrete dozer trap (see #25 below) below the crushed coal storage pile to the top of the temporary loadout structures (see #20 below) in order to fill coal haulage trucks. Two (2) loadout conveyors (#1 and #2) will be utilized. The conveyors will transport coal to the Temporary Loadout #1 and #2 respectively. The conveyor structures are steel frameworks running 48" conveyor belts. A large portion of conveyor #1 is contained within a 9' diameter steel plate tube that extends underground to the temporary underground reclaim room (see #16 above). Conveyor #2 extends from the temporary concrete dozer trap (see #25 below). The temporary loadout conveyors are shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary loadout conveyors will be removed.

19) Temporary Loadout MCC Building
The temporary loadout MCC building is a portion of the temporary coal handling facilities for the mine. The building is the Motor Control Center (MCC) for the temporary loadout conveyor #1 (see #18 above). The structure is a steel plate building measuring approximately 6' by 16' by 8' tall. The electrical control for the conveyor motor and other electrical components for the temporary loadout assembly #1 are housed within the MCC building. The temporary loadout MCC building is shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary loadout MCC building will be removed.

20) Temporary Loadout Structures
The temporary loadout structures are a portion of the temporary coal handling facilities for the mine. Two (2) temporary loadout structures will be utilized (#1 and #2). The loadout structures are wide flange steel-framed structures on concrete foundation systems, with 6" thick concrete pads and aprons. The MCC (similar to #19 above) for conveyor #2 (see #18 above) is located atop temporary loadout #2. The tops of the structures also support the motors that drive the respective temporary loadout conveyors #1 and #2 (see #18 above). Coal is transferred, via the temporary loadout conveyors, from the crushed coal stockpile to the top of the loadout structures, where it falls through a spreader assembly into coal haulage trucks below for delivery off-site. The temporary loadout structures are shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary loadout structures will be removed.

21) Temporary Crusher Conveyor
The temporary crusher conveyor is a portion of the temporary coal handling facilities for the mine. The temporary crusher conveyor conveys coal from...
the temporary underground reclaim room (see #16 above) below the ROM coal stockpile to the temporary crusher / screen building (see #22 above) for sorting and crushing. The conveyor structure is a steel framework running a 48" conveyor belt. A portion of the conveyor is contained within a 9' diameter steel plate tube that extends underground to the temporary underground reclaim room (see #16 above). The temporary crusher conveyor is shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary crusher conveyor will be removed.

23) Temporary Crushed Coal Conveyor (48")

The temporary crushed coal conveyor is a portion of the temporary coal handling facilities for the mine. The temporary crushed coal conveyor conveys coal from the temporary crusher / screen building (see #22 above) that has been sorted and crushed on the Upper Pad to the crushed coal stockpile on the Middle Pad. The conveyor structure is a steel framework, supported by steel bents on concrete foundations, running a 48" conveyor belt. The temporary crushed coal conveyor is shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary crushed coal conveyor will be removed.

24) Temporary Crusher MCC Building

The temporary crusher MCC building is a portion of the temporary coal handling facilities for the mine. The building is the Motor Control Center (MCC) for the temporary crusher / screen building (see #22 above). The structure is a steel plate building measuring approximately 6' by 16' by 8' tall. The electrical control for the conveyor motors and other electrical components for the temporary crusher / screen building are housed within the MCC building. The temporary crusher MCC building is shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary crusher MCC building will be removed.

25) Temporary Concrete Dozer Trap

The temporary concrete dozer trap is a portion of the temporary coal handling facilities for the mine. The structure will be composed of concrete walls with a steel roof structure. The wall facing the loadouts (north wall) will be open for the Loadout Conveyor #2 and for access to the equipment housed in the dozer trap. The roof of the structure has an opening and gate that allows coal to fall from the bottom of the stockpile above onto the temporary loadout conveyor #2 for transport Temporary Loadout #2. These structures are shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary concrete dozer trap will be removed.
27) Temporary Concrete Equipment Pad
The temporary concrete equipment pad is a portion of the temporary coal handling facilities for the mine. The pad is a 12" thick, steel reinforced concrete slab. The drive motor and take-up equipment for the temporary crushed coal conveyor (see #21 above) rest upon this concrete pad. The concrete equipment pad is shown on Plate 5-2. The concrete equipment pad will remain until final reclamation, at which point it will be buried with other concrete materials as described in the Reclamation Plan.

30) Existing ROM Coal Conveyor from Underground (60")
The ROM (Run of Mine) coal conveyor from underground is a part of the temporary AND long-term coal handling facilities for the mine. The ROM coal conveyor from underground ties into the coal conveyor system within the underground mine workings to convey mined coal from the working face to the surface. The surface portion of the ROM coal conveyor measures approximately 300' long. The assembly is a steel framework, supported by steel bents on concrete foundations, running a 60" conveyor belt. The ROM coal conveyor from underground is shown on Plate 5-2. The existing ROM coal conveyor from underground will remain through the life of the mine. The alignment and elevation of the conveyor structure are such that when the long-term coal handling system is constructed, the existing ROM coal conveyor structure will be extended to the future ROM coal stacking tube as shown on Plate 8-1. The entire assembly (existing and future) will be removed upon final reclamation.

31) Steel Portal Canopy Structure
A steel portal canopy structure is constructed at each portal of the mine. The canopy consists of steel wide flange posts and beams, and sheathed with steel plate. The canopy structure protects the portals (openings) to the underground workings. The canopies are constructed to meet MSHA regulations. Multiple steel portal canopy structures are utilized for the mine. The locations of the steel portal canopies are shown on Plates 5-2 and 5-2a, and in Appendix 5-9. The steel portal canopy structures will each remain throughout the life of the mine, or until its respective portal is no longer necessary and is sealed and reclaimed; whichever comes first. All remaining steel portal canopy structures will be removed during final reclamation.

32) Concrete Conveyor Bay at Belt Portal
The concrete conveyor bay at the belt portal is a portion of the temporary AND long-term coal handling facilities for the mine. The bay was originally used to house the belt drive for the original ROM conveyor structure, which has since been removed. The concrete conveyor bay now cradles and
supports the westernmost end of the ROM coal conveyor from underground (see #30 above) at the surface. The concrete conveyor bay is shown on Plate 5-2. The concrete conveyor bay will remain in place for the life of the mine, and will be removed upon final reclamation.

34) Mine MCC Building / Electrical Tower
The Mine MCC (Motor Control Center) building is the main hub for electrical power running from the surface to the underground mine workings. Nearly all power to the underground mine equipment runs through this 21' by 12' by 11.5' tall, steel plate building. The Mine MCC building shares a concrete foundation with an electrical tower that is approximately 45.5' tall, and constructed of 10"x10" tube steel. The electrical tower receives overhead power lines extending from the Mine Substation (see above). Some power lines extend to the Main Mine Ventilation Fan (see #36 below), but most power runs to a transformer at the base of the tower, then into the Mine MCC Building for distribution to the underground mine workings. The Mine MCC Building, Electrical Tower and transformer all share a common poured concrete foundation. The Mine MCC Building / Electrical Tower assembly is shown on Plate 5-2. The Mine MCC Building / Electrical Tower will remain through the life of the mine, and the entire assembly and foundation will be removed upon final reclamation.

35) Backup Ventilation Fans
The original ventilation fans for the mine remain in-place on a concrete foundation. These fans are attached to Portal #0. When the main mine ventilation fan (see #36 below) came online, the original ventilation fans became the backup ventilation fans. The backup ventilation fans are 250 horsepower fans that will blow fresh air into the mine’s underground workings in the event that the main mine ventilation fan (see #36 below) fails. The backup ventilation fans are shown on Plate 5-2. The backup ventilation fans and their respective concrete foundation will remain in-place through the life of the mine, and will be removed at final reclamation.

36) Main Mine Ventilation Fan / Electrical Tower
The main mine ventilation fan is a 1,500 horsepower blowing fan, located on the ledge that is the exposed top of the Sunnyside Sandstone, at the North Breakout of the underground workings. The fan’s purpose is to blow fresh air into the underground mine workings for mine personnel throughout the mine, and to ventilate all open areas within the mine. The fan blows into Portal #2 of the North Breakout. The main mine ventilation fan rests on a poured concrete foundation that it shares with a 35' tall electrical tower, similar to the electrical tower at the Mine MCC Building (see #34 above).
Overhead power transmission lines (see #12 above) extend from the Mine MCC Building/Electrical tower (see #34 above) to provide power for the main mine ventilation fan. The main mine ventilation fan and associated concrete pad and electrical tower have been constructed to meet MSHA regulations and requirements. The location of the Main Mine Ventilation Fan is shown on Plate 5-2. The fan, electrical tower and concrete foundation will remain throughout the life of the mine, and will be removed upon final reclamation.

39) Chain Link Fencing
Six foot high chain-link fencing has been, and will be installed as shown on Plate 5-2. The fencing will be constructed to protect the public and wildlife from the Mine Substation (see above) and along sections of County Road RS-2477, along the western edge of the permit boundary. The fencing will remain throughout the life of the mine, and will be removed upon final reclamation.

43) Temporary Conveyor Counterweight Structures
The temporary conveyor counterweight structures add weight to conveyor belts to keep them taut during operation. The Temporary Loadout Conveyors (see #18 above) and the Temporary Crusher Conveyor (see #21 above) each have a temporary conveyor counterweight structure. The structure is constructed of a steel framework that guides the counterweight for the respective conveyor. The structure rests on a 12" thick, steel reinforced concrete slab. The locations of the temporary conveyor counterweight structures are shown on Plate 5-2. Upon the completion of the long-term coal handling facilities’ construction, the temporary conveyor counterweight structures will be removed.

44) Jersey Barrier Guard Rails
A Jersey Barrier is a prefabricated, modular concrete barrier used to guide vehicular traffic and minimize damage in cases of incidental contact. When placed end-to-end, these barriers prevent vehicles from running off designated roadways. Jersey barrier guard rails are installed according to MSHA requirements. The locations of the jersey barrier guard rails are shown on Plate 5-2. The jersey barrier guard rails will be utilized throughout the life of the mine and will be removed upon final reclamation.

45) Concrete Trash Chute
The concrete trash chute is used for deposition and storage of trash until the refuse can be hauled to a nearby State-approved solid waste disposal area (landfill). The trash chute is constructed of concrete walls and floor; open at one end to allow for vehicles to dump and remove trash as necessary.
Chain link fencing will be stretched horizontally across a portion of the top of the chute to prevent the wind from blowing lighter pieces of trash out of the enclosure. The location of the Concrete Trash Chute is shown on Plate 5-2. The concrete trash chute will remain through the life of the mine, and will be removed upon final reclamation.

46) Gantry Lift Assembly

The Gantry Lift Assembly is a stationary assembly consisting of two (2) lifting crane structures, working together to lift heavy equipment and machinery from a trailer that cannot be lifted by other equipment (i.e. a forklift or other mobile machinery). Each of the lifting crane structures is rated for forty (40) tons. A set of two poured, steel reinforced concrete footing and foundations will support the legs of both crane structures. Each footing and foundation assembly will extend approximately forty (40) feet in length. The location of the Gantry Lift Assembly is shown on Plate 5-2. The Gantry Lift Assembly will remain through the life of the mine, and will be removed upon final reclamation.

SUPPORT FACILITIES

Mine Facilities Access Road / Truck Loadout Road

The mine facility road, shown on Plate 5-2, begins at the edge of County Road 164 (Lila Canyon Road), and allows for access to the Lower Pad and the temporary loadout structure (see #20 above). The road has been located in the most practical location taking into consideration grade, stability, and alignment. Employees will use this road to access the office & bathhouse facilities on the Lower Pad. Coal haul trucks use this road to access the temporary truck loadout (see #20 above) on the Middle Pad. All supplies will be hauled on a short portion of this road from the Lower Pad and Storage Area Pad to the slope access road. The road is paved with crushed granite and is regularly watered with a sprinkler system in order to minimize dust and provide a good surface for heavy truck traffic, as well as facility access. The facility access road is approximately 30' wide to provide for two-lane traffic, and has the appropriate drainage controls to insure long term life and low maintenance. The road has been constructed according to the appropriate R645-534 and R645-527 regulations. The road will remain throughout the life of the mine, and will be removed upon final reclamation.

Rock Slopes

Access to the underground workings of the Lila Canyon Mine is provided through two rock slopes driven from the top of the Mancos shale, sloping up to the intersection of the coal seam. One portal provides access for men, equipment and material to the mine. The second access slope contains the
underground portion of run-of-mine belt line that attaches to the existing ROM Coal Conveyor from Underground at the surface (see #30 above) that transports mined coal to the run of mine stock pile at the Upper Pad. The two rock slopes incline upward at approximately 12%, from a starting elevation of approximately 6150'. The intersection of the coal seam and the rock slope takes place at approximately the 6,300 feet elevation. The lengths of the slopes were minimized by taking advantage of the coal seam dip which is approximately 12% to the east. The rock material removed from the slopes has been used as fill material for the pads of the surface facilities. The rock slope material / underground development waste contains mostly shale, sandstone and mudstone. Small traces of coal may be found, but the amount is insignificant. There are no known coal seams or significant rider seams found below the Sunnyside Seam in the Lila Canyon Portal Area. The rock slope and rock slope material fill locations are shown on Plate 5-2. The rock slopes will be sealed at the portals according to MSHA regulations at the completion of mining operations, and reclaimed per the Reclamation Plan.

**Sediment Ponds**

The sediment ponds have been designed to provide for adequate sediment protection for the project area. Surface water running off disturbed areas will be routed into the sediment ponds. The sediment ponds have been designed according to the appropriate R645 regulations, and the designs can be found in Appendix 7-4, and Plates 7-6a and 7-6b. Because the sediment ponds do not meet the requirement of 30 CFR 77.216(a), an MSHA number for the sediment ponds is not required. Sediment Pond #1 is located on the southwest corner of the property. Sediment Pond #2 is located on the northwest corner of the property. Both ponds are shown on Plate 5-2. Please refer to Chapter 7 for detailed information on drainage reporting to both ponds. Both sediment ponds will remain through the life of the mine, and will be removed during final reclamation according to the approved reclamation plan.

**Slope Access Road / Portal Access Road**

The slope access road connects to the facility access road near the northeast corner of the Middle Pad, and follows an alignment that takes into consideration grade and direct access. The slope access road is used to provide access to the rock slopes (see above), which in-turn provides access to the underground workings. The slope access road is used as access for all men, material and equipment needed within the mine. Since the slope access road provides for frequent access for men, equipment and materials for a period of six months or longer, the slope access road is classified as a primary road and will be paved. The slope access road has been designed.
constructed, and maintained according to appropriate R645 regulations. The slope access road is shown on Plate 5-2. The slope access road will remain throughout the life of the mine, and will be removed during final reclamation.

**New Storage Pad**

A new supply and materials storage pad will be constructed directly south of the Mine Substation (see above), but within the existing disturbed boundary line as shown on Plate 5-2. The new pad will be constructed similarly to the existing Lower, Middle and Upper Pads (see Chapter 2, Section 232.500), with a gravel covering. The new storage pad is needed so large trucks delivering and/or collecting materials and supplies will not congest the parking and supply areas already in-place on the Lower Pad, or interfere with the Mine Facilities Access Road / Truck Loadout Road (see above) and trucks preparing to load coal or loaded trucks hauling coal from the mine site. Moving the delivery trucks to the new storage pad will reduce vehicular congestion, and decrease the possibility of accidents resulting from said congestion. The new storage pad will be utilized throughout the life of the mine, and will be reclaimed per the Reclamation Plan.

**New Storage Pad Access Road**

The new storage pad access road will extend from the Middle Pad to the New Storage Pad (see above), which lies just south the Mine Substation (see above). The new storage pad access road will be used to provide access between the two pads for mine personnel, equipment and supplies. Since the new storage pad access road will provide access for men, equipment and materials for a period of six months or longer, the new storage pad access road is classified as a primary road, and will be paved. The new storage pad access road has been designed and will be constructed and maintained according to appropriate R645 regulations. The new storage pad access road is shown on Plate 5-2. The new storage pad access road will remain throughout the life of the mine, and will be removed upon final reclamation.

**New Storage Pad Service Road**

The new storage pad service road, shown on Plate 5-2, will begin at the edge of County Road 164 (Lila Canyon Road), and will allow for access to the new storage pad (see above) directly south of the Mine Substation (see above). The first approximately 350 feet of the new storage pad service road from County Road 164 (Lila Canyon Road) will be a reworking of the existing County Road RS-2477. The new storage pad service road will then continue to the new storage pad (see above). The new storage pad service road will be approximately 30 feet wide and provide access for trucks to deliver and/or collect supplies, materials or equipment related to mine activities, without
increasing congestion on the mine facilities access road / truck loadout road (see above). Since the new storage pad service road will provide access for men, equipment and materials for a period of six months or longer, the new storage pad service road is classified as a primary road, and will be paved. The new storage pad service road has been designed and will be constructed and maintained according to appropriate R645 regulations. The new storage pad service road is shown on Plate 5-2. The new storage pad service road will be removed during the course of construction of the long-term coal handling facilities. The portion of the new storage pad road that lies along the existing County Road RS-2477 may remain or be reclaimed. The BLM and Emery County will be consulted when appropriate, and the Division will be advised as to the course of action for the roadway (remain or be reclaimed). Access to the new storage pad (see above) will be rerouted through the new truck loadout road when the long-term truck loadout road is completed. When this happens, the existing truck loop will become the new truck loading/unloading area per Plate 8-1 for the future warehouse on the Upper Pad.

**Topsoil Pile**
The topsoil pile has been located on the southwest end of the surface facilities. The pile has been designed to contain adequate topsoil for redistribution according to the reclamation plan found in Chapter 5. The proposed location provides for good protection from wind contamination, as well as protection from mine related activities. The location of the topsoil pile is shown on Plate 5-2. The topsoil will be redistributed across the disturbed area according to the mine reclamation plan.

**6) Temporary Concrete Walkway**
Temporary concrete walkways have been constructed at temporary buildings, the temporary bath house (see #1 above) and temporary office trailers (see #2 above). The walkways are generally 6' wide by 4" thick. The locations of the temporary concrete walkways are shown on Plate 5-2. The temporary concrete walkways will be removed as their respective temporary buildings are removed.

**15) Temporary Fuel Storage Tanks**
The temporary locations of the fuel storage tanks are on the Middle Pad as shown on Plate 5-2. The tanks are bulk fuel storage tanks containing gasoline or diesel fuel for mine vehicles. The tanks are supported by steel legs above integral steel secondary containment basins. Upon completion of the long-term surface facilities' construction, the fuel tanks will be relocated to their long-term location on the Upper Pad, as shown on Plate 8-1. The fuel tanks will remain in their long-term locations for the life of the mine.
mine, and will be removed upon final reclamation.

29) Sediment Pond Spillway Structure
As shown on Plate 5-2, and in Chapter 7, Sediment Ponds #1 and #2 each have a spillway structure constructed of corrugated metal pipe to allow for surplus water to exit the respective pond. Each spillway is equipped with an oil skimmer structure. See Plates 7-6a and 7-6b for detailed drawings. The sediment pond spillway structures will remain throughout the life of the mine and will be removed during final reclamation.

38) Powder and Cap Magazines
Powder and cap magazines will be mobile, temporary, and supplied by the explosive distributor. Upon reclamation, the powder and cap magazines will be returned to the distributor.

42) Temporary Loadout Light Board
The temporary loadout light board consists of a free standing metal post pedestal with traffic control lights for the temporary loadout structure (see #20 above). The pedestal is mounted upon a steel reinforced concrete pad. The lights provide information to coal haul truck drivers as coal is loaded into their trucks at the temporary loadout structure. The temporary loadout light board location is shown on Plate 5-2. Upon the completion of the long-term coal handling facilities' construction, the temporary light board and concrete support pad will be removed.

Long-Term Underground Pipes
The locations of the long-term underground pipes have yet to be determined. Once detailed engineering design is completed, the underground pipes will be added to Plate 5-2, or other appropriate plates as required. Long-term underground pipes will be abandoned and left in place upon final reclamation.

Culverts
A complete list and design for the culverts can be found in Appendix 7-4, Tables 9 and 10; and are shown on Plate 7-5. A summary of the culverts follows:

<table>
<thead>
<tr>
<th>Culvert</th>
<th>Length</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC-1</td>
<td>72'</td>
<td>24&quot;</td>
</tr>
<tr>
<td>DC-2</td>
<td>60'</td>
<td>18&quot;</td>
</tr>
<tr>
<td>DC-3</td>
<td>65'</td>
<td>18&quot;</td>
</tr>
<tr>
<td>DC-4</td>
<td>400'</td>
<td>24&quot;</td>
</tr>
<tr>
<td>DC-5</td>
<td>350'</td>
<td>24&quot;</td>
</tr>
<tr>
<td>DC-6</td>
<td>107'</td>
<td>24&quot;</td>
</tr>
</tbody>
</table>
Horse Canyon Mine - Lila Canyon Extension

| DC-7  | 155' | 24" |
| DC-8  | 167' | 24" |
| DC-9  | 186' | 24" |
| DC-10 | 60'  | 24" |
| DC-11 | 101' | 24" |
| DC-12a| 140' | 24" |
| DC-12b| 79'  | 24" |
| DC-12c| 357' | 24" |
| DC-12d| 9'   | 24" |
| DC-13 | 60'  | 24" |
| DC-14 | 40'  | 24" |
| DC-15 | 45'  | 18" |
| DC-16 | 25'  | 18" |
| DC-17 | 120' | 18" |
| DC-18 | 27'  | 18" |
| SP2-1 | 165' | 18" |
| UC-1  | 480' | 60" |

As per the approved Air Quality Order and R645-201-534.300, all primary roads will be paved or surfaced with rock, crushed gravel, asphalt or other approved material. Roads and pad areas used by mobile equipment will be treated with water or other dust suppressant. Open stockpiles will be watered as conditions warrant.

521. Included in this section are maps, cross sections, narratives, descriptions and calculations used to satisfy the relevant requirements. This section describes and identifies the lands subject to coal mining and reclamation operations covering the estimated life of the project.

521.100 This application includes the cross sections, maps and plans needed to present the relevant information required by the Division. This information includes the following:

521.110. Plate 5-1 Shows area previously mined and approximate dates of mining.

521.111 Plates 5-1 and 2-2 show the location and extent of known workings of inactive, or abandoned underground mines. The surface portals or mine openings to the surface are shown. Plates 5-1 and 2-2 have been prepared and certified by or under the direction of a registered professional.
Doelling lists several coal mines and mining activity within or adjacent to the permit area. Doelling lists the Calkins prospect, the Lila Canyon prospect, and the Prentiss prospect. In addition, Doelling lists several coal mines: Prentiss, Utah Blue Diamond, Blue Diamond and Heiner Mines. The research has shown that the Prentiss, Utah Blue Diamond, Blue Diamond and Heiner Mines were engulfed by the Book Cliffs mine. The Lila Canyon prospect refers to the old Lila Canyon mine fan portals used to ventilate the Geneva (Horse Canyon) mine. The Calkins prospect is believed to have been engulfed by the Geneva mine.

An outcrop fire has been detected in an area north of the exiting permit area "A." The fire is off the permit area and located in an area that has been sealed from the old horse canyon works. The outcrop fire is not anticipated to cause any problems with mining at the Lila Canyon Mine.

521.112 No surface mined areas are found within the permit area. Therefore, this section does not apply.

521.120 Three existing structures, a 48" and a 60" CMP culvert located near the new proposed sediment pond, and the Little Park Road can be found at the Lila Canyon Mine. The existing culverts are shown on plate 5-1A and the road on Plate 5-1. Existing Horse Canyon facilities are discussed in part "A" of this plan, and used for historical purposes only.

521.121 There are no buildings within 1000 feet of the proposed permit area, except those used as a part of the Lila Canyon mining operation.
521.122 There are no subsurface man-made features, other than the culverts discussed in 521.200, within, passing through, or passing over the proposed permit area.

521.123 Plate 4-1, as well as others, shows the existing County Road 126 which is located partly within 100 feet of the proposed permit area. In addition, the Little Park road is located above the surface facilities within the permit area. The Little Park Road is also shown on plate 4-1.

521.124 There are no known existing areas of spoil, waste, coal development waste, or non-coal waste disposal, dams, embankments, other impoundments, and water treatment and air pollution control facilities, except those used as part of the mining operation.

521.125 There are no existing sedimentation ponds, permanent water impoundment, coal processing waste banks or coal processing waste dams near or within the permit area.

521.130 Landowner and right of entry maps are included in the permit application. These maps and cross sections show the following:

521.131 Plate 4-1 shows the surface ownership and Plate 5-4 shows the coal ownership of land included in or contiguous to the permit area.

521.132 The applicant has the legal right to enter and begin coal mining and reclamation operations on all areas shown within the permit area. The permit area is shown on Plates 5-3 and 5-4 as well as others.

521.133 Coal mining or reclamation operations are planned within 100 feet of a public road. There are no plans to relocate public roads.

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521.133.1 Emery County has given permission to conduct coal mining or reclamation operations within 100 feet of the county road. (See Appendix 1-4)

521.133.2 The current permit does not propose any relocation of public roads. Therefore, this section is not applicable.

521.140 Mine maps and permit area maps and/or cross-sections will clearly indicate the following:

521.141 Plate 5-1 shows the permit boundary and Plate 5-2 shows the disturbed area boundary. Additional subareas that might require additional permits are addressed in Section 112.800 and 4-1B.

521.142 The underground workings are shown on Plate 5-5.

521.143 The proposed disposal site for placing the slope rock is shown on Plate 5-2 as well as other appropriate plates.

521.150 Plates 6-2, 6-3, and 6-4, show surface contours that represent the existing land surface configuration of the proposed permit area.

521.151 The Plates show the surface contours for all areas to be disturbed as well as over the total permit area. The Plates showing the surface contours have been prepared by or under the supervision of a registered engineer.

521.152 No previously mined areas are included within Part “B.” Therefore, this section does not apply.

521.160 The maps, plates, and cross sections associated with this chapter clearly show:
Proposed buildings, utility corridors, and facilities are shown on Plates 5-2 and 8-1, as well as others.

The area of land affected according to the sequence of mining and reclamation is shown on the appropriate plates.

Land for which a performance bond will be posted is shown on the appropriate plate. Plates 5-2 and 8-1, as well as others, show the area for which the performance bond will be posted. All disturbed areas within the permit boundary have been bonded.

Existing coal storage and loading areas are shown on Plates 5-2 and certified as required. Future coal storage and loading areas are shown on Plate 8-1 and certified as required. Additional information can be found in Appendix 5-4.

Topsoil and waste piles are shown on Plate 5-2, as well as others.

The waste disposal areas are shown for non-coal waste and underground mine waste on Plate 5-2.

No explosives are expected to be stored on-site. However, if explosives are stored, they will be stored as discussed in Section 520. on Plate 5-2.

Since Lila Canyon mine is an underground operation, this paragraph is not applicable.

The refuse pile is shown on Plate 5-2 and discussed in Appendix 5-7.

Transportation facility maps describing roads and conveyors maintained within the permit are shown with descriptions of roads, embankments, culverts,
and drainage structures are presented in section 520 and are shown on Plates 5-2, 7-2, and 7-5.

521.180 Support facilities are described in section 520 and are shown on Plate 5-2. Plate 5-2 is the official disturbed area boundary map.

521.190 Other relevant information required by the Division will be addressed.

521.200 Signs and markers will:

521.210 Signs and markers will be posted, maintained, and removed by the person who conducts the coal mining and reclamation operations.

521.220 Signs and markers will be of uniform design that can be easily seen and read and be made of durable material and conform to local laws and regulations.

521.230 Signs and marker will be maintained during all activities to which they pertain.

521.240 Mine and Permit Identification Signs.

521.241 Mine and permit identification signs will be displayed at each point of access from public roads to areas of surface operations and facilities on permit areas.

521.242 Since Lila Canyon Mine is an underground operation, this section is not applicable.

521.243 Mine and permit identification signs, where required, will show the name, business address, and telephone number of the permittee and the identification number of the permanent program permit authorizing coal mining and reclamation operations.

521.244 Mine and permit identification signs will be retained and maintained until after the release of all bonds for the permit area.
521.250 Perimeter Markers

521.251 The perimeter of all areas affected by surface operations or facilities before beginning mining activities will be clearly marked with perimeter markers.

521.252 Since Lila Canyon Mine is an underground operation, this section is not applicable.

521.260 Buffer Zone Markers

521.261 Signs will be erected to mark buffer zones as required and will be clearly marked to prevent disturbance by surface operations and facilities.

521.262 Since Lila Canyon Mine is an underground operation, this section is not applicable.

521.270 Topsoil Markers will be erected to mark where topsoil or other vegetation-supporting material is physically segregated and stockpiled.

522. Coal Recovery

Additional Details can be found in the R2P2 on file at the BLM Office.

Effective barrier and pillar designs are essential for safe and productive underground mining. Barrier pillars will be sized according to accepted engineering practices. One or more of the following methods may be used to properly size barrier pillars: Dunn’s Rule, the Old English Barrier Pillar Law, Pennsylvania Mine Inspector’s Formula, Ash and Eaton Impoundment Formula, Pressure Arch Method, British Coal Rule of Thumb, North American Method, Holland Rule of Thumb, or Holland Convergent Method.

Regardless of the methods or care taken to properly size barrier pillars, the true effectiveness on any design can only be determined by conducting full-scale in-mine performance evaluations. Mine experience and history in the local area will have as much influence on pillar sizes as does the engineering formulas.
Barrier pillars will be utilized to isolate the abandoned Horse Canyon Mine from the new Lila Canyon Mine. Barrier pillars will also be used to simplify ventilation, to provide independent escape routes, and to possibly retain large quantities of mine water. Barrier pillars will be employed along the outcrop in order to maintain ventilation courses.

A barrier pillar, where no second mining will be allowed within the barrier, will be used to protect the escarpments. The width of the escarpment barrier will be determined by implementing a 21.5° angle of draw projected, downward from the surface to the coal seam. Development mining, or first mining, will be allowed within the escarpment barrier.

For longwall mining applications, the abutment loading is of prime importance. Initial longwall pillars will be designed using the ALPS method. Again, mine experience and history in the local area will have as much influence on pillar sizes as does the engineering formulas.

Mine pillars will be sized taking into consideration the coal strength, depth of cover, width and height of pillars, using one or more of the following methodologies: Obert-Duvall, Holand-Graddy, Holland, Salamon-Munro, or Bieniawski. Again, mine experience and history in the local area will have as much influence on pillar sizes as does the engineering formulas.

523. Mining Methods:

Mining will begin in Section 15, T16S, R14E, in the Sunnyside seam. Development of the Sunnyside seam will be in a down dip direction toward the east. The seam will be accessed by two 1,200 foot slopes driven up at 12% from the base of the cliffs.

Production during the first year is estimated to be 200,000 tons. The second through the fifth year production should be between 1,000,000 and 1,500,000 using continuous mining methods. If and when tonnage demand increases to justify longwall mining, production could peak as high as 4,500,000 tons a year and continue at that level for the life of the mine.

Mine production will begin with the slope construction. Once the coal is encountered, development will continue using continuous miners and various haulage types. Battery, cable, or continuous haulage may be used in conjunction with continuous miners in development. Continuous miners will account for all the production during the first two to five years. Mining will consist of driving mains, developing room and pillar panels.
and gate entries for future longwall mining.

The majority of the second mining will be performed using longwall equipment. However, in isolated areas room and pillar type of mining may be used in areas not suitable for longwall mining. Longwall panels are sited approximately parallel lengthwise to the strike with a slight up dip orientation to provide drainage for the development faces. This practice will be applied to the continuous miner panels wherever possible. 

(See plate 5-5)

Roof control and ventilation plans will be submitted to MSHA and approved prior to any underground mining activities.

An air quality permit from the State Division of Air Quality has been obtained and will be modified as needed.

Ventilation of the mine will be by an exhaust and/or blowing type system. It has been estimated that 900,000 cfm will be required at full production. Intake air will be supplied by slopes and entries from the surface.

A water supply system will be installed. Potable water from an approved source will be hauled by truck and stored in a mine site storage tank located near the man and coal slope portals. Alternative sources for potable water are being considered. A treatment plant may be indicated. Process water will be hauled from the Price River or other approved source by truck and stored in another mine site storage tank. It is anticipated that once the old two entry development panel is encountered, adequate process water may be obtained from the old works. This process water will provide for dust control, water to the mine and fire suppression. Mine water will be used with the process water. See Appendix 7-3 (PHC) for water usage calculations.

Dust suppression will be accomplished by the use of sprays on all underground equipment as required. Sprays will also be used along sections of the conveyors and at transfer points.

No major de-watering concerns are anticipated at this property. The workings are expected to produce some water with more water being produced as the depth of mining increases. Part of this water will be used for dust suppression. The remainder will be collected in sumps and pumped to mined out sections of the mine or to the surface and treated when necessary.
Underground mining equipment to be used at Lila Canyon is typical of most room-and-pillar and longwall mines. A list of major equipment which may be used underground is listed below. Additional equipment not on the list may be used as needed.

- Continuous Miners
- Roof Bolters
- Battery Shuttle Cars
- Electric Shuttle Cars
- Diesel Ram Cars
- Feeder Breakers
- Continuous Haulage Units
- Battery Scoops
- Diesel Scoops
- Diesel Service Vehicles
- Diesel Material Haulers
- Diesel Belts and Terminal Groups
- Battery and Diesel Man Trips
- Longwall Shields
- Longwall Pan-lines
- Longwall Shears
- Longwall Stage-loaders
- Longwall Pumps
- Various Water Pumps
- Various Transformers and Switches
- Rock Drills
- Loaders

523.100 No Surface Coal Mining and Reclamation Activities are proposed to be conducted within the permit area within 500 feet of an underground mine. Therefore, this section is not applicable.

523.200 No Surface Coal Mining and Reclamation Activities are proposed with 500 feet of an underground mine. Therefore, this section is not applicable.

523.210 No Surface Coal Mining and Reclamation Activities are proposed to be conducted within the permit area within 500 feet of an underground mine. Therefore,
this section is not applicable.

523.220 No Surface Coal Mining and Reclamation Activities are proposed to be conducted within the permit area within 500 feet of an underground mine. Therefore, this section is not applicable.

524. Blasting and Explosives: Surface blasting activities incident to underground coal mining are planned for the Lila Canyon mine during construction of the access slopes only.

524.100 Steps have been taken to achieve compliance with the blaster certification program and are described in this permit application.

524.110 Surface blasting involving 5 lbs. of explosives or more will be done under the direction of a certified blaster.

524.120 Blasting certificates will be carried by the blasters or will be on file at the permit area during blasting operations.

524.130 The blaster and at least one other person will be present at the firing of a blast.

524.140 Persons responsible for blasting operations at a blasting site will be familiar with the blasting plan, if required, and site-specific performance standards and give on-the-job training to persons who are not certified and who are assigned to the blasting crew or assist in the use of explosives.

524.200 Since the planned blasting does not meet the requirements of 524.211 or 524.212, a blast design is not included in the permit application. If, in the future, blasting falls under section 524.200, then a plan will be submitted to Division for approval.

524.210 Since the planned blasting does not meet the
requirements of 524.211 or 524.212, anticipated blast designs are not required.

524.300 Since planned blasting requires more than 5 lbs. of explosives, the preblasting survey is addressed where applicable in this permit application.

524.310 There are no dwellings or other structures located within one-half mile of the permit area owned by anyone but the operator. The operator will prepare the preblast survey if required. Notification procedures implied in this section are not applicable.

524.320 Since the operator is the only owner of structures and no dwelling exists within one-half mile of any part of the permit area, this section is not applicable.

524.330 Because the operator is the only owner of structures or dwellings within one-half mile of any part of the permit area, this section is not applicable.

524.340 Because the operator is the only owner of structures or dwellings within one-half mile of any part of the permit area, this section is not applicable.

524.350 Because the operator is the only owner of structures or dwellings within one-half mile of any part of the permit area, this section is not applicable.

524.400 The blast schedule is as follows:

524.410 Since there are no residents within one-half mile of the projected blasting site, this section does not apply.

524.420 All surface blasting will be conducted between sunrise and sunset, unless nighttime blasting is approved by the Division.

524.430 Since there are no residents within one-half mile of the projected blasting site, this section does not apply.
Since there are no residents within one-half mile of the projected blasting site, a flexible blasting schedule is allowable. Surface blasting may take place anytime during daylight hours, unless approved differently by the Division.

Because of the remote location of the Lila Canyon Mine, over six miles from the nearest locality (Columbia), this section does not apply.

Since the town of Columbia is the nearest locality and is over six miles distance from the permit area, this section does not apply.

The blasting signs, warnings and access control are described below.

Blasting signs will meet the specifications of R645-301-521.200. The following will apply.

Signs reading “Blasting Area” will be conspicuously place at the point where any road provides access to the blasting area.

The signs posted at all entrances to the permit area from public, roads, or highways will be placed in a conspicuous location and will state “Warning! Explosives in Use,” and will clearly list and describe the meaning of the audible blast warning and all clear signals that are in use.

Audible warning and all-clear signals of different character or pattern will be given. Each person within the permit area will be trained in the meaning of the signals.

Access within the blasting area will be controlled until the operator has reasonably determined the following:

No unusual hazards, such as imminent slides
or undetonated charges, exist; and

524.532 Access to and travel within the blasting area can be safely resumed.

524.600 Adverse blasting effects are described as follows:

524.610 Blasting will be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course, channel, or availability of surface or ground water outside the permit area.

524.620 Airblast Limits

524.621 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.622 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.630 Monitoring: Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.640 Ground Vibration: Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.650 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.
524.660 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.670 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.680 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.690 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, sections 524.620 through 524.632 and 524.640 through 524.680 do not apply.

524.700 Records of blasting operations will be maintained at the mine site for at least three years, and will be available for inspection by the Division or the public.

524.710 Blasting records will include:

524.711 The name of the operator will be on the blasting record.

524.712 The location, date, and time of the blast will be recorded on the blasting record.

524.713 The name, signature, and certification number of the blaster will be recorded on the blasting record.

524.720 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.730 Weather conditions will be recorded on the blasting.
record.

524.740 A record of the blast will include the following:

524.741 The type of material blasted will be recorded on the blasting records.

524.742 Sketches of the blast pattern including number of holes, spacing, burden, decks, and delay pattern will be recorded on the blasting record.

524.743 The diameter and depth of holes will be recorded on the blasting record.

524.744 The type of explosives used will be recorded on the blasting record.

524.745 The total weight of the explosives used per hole will be recorded on the blasting record.

524.746 The maximum weight of explosives detonated in an eight-millisecond period will be recorded on the blasting record.

524.747 Information on the initiation system will be recorded on the blasting record.

524.748 The type and length of the stemming will be recorded on the blasting record.

524.749 Mats or other protections used will be recorded on the blasting record.

524.750 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, a record of seismographic and airblast information is not required.

524.760 Since a blasting schedule is not required, this section does not apply.

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524.800 The operator will comply with the various appropriate State and Federal laws and regulations in the use of explosives.

525. Subsidence: The permittee will comply with the appropriate R645-301-525 requirements.

525.100 Subsidence Control Plan

525.110 Plate 5-3 shows the location of State appropriated water and Plate 5-3 (Confidential) shows the eagle nests that potentially could be diminished or interrupted by subsidence.

525.120 SUBSIDENCE POTENTIAL

A review of renewable resources in and adjacent to the permit area found resources consisting of ground water, grazing, timber, and recharge areas. Subsidence from underground coal mines has been believed to affect overlying forest and grazing resource lands in the following ways:

- Formation of surface fissures which intercept near surface soil moisture thus draining the water away from the root zone with deleterious effects.
- Alterations in ground slope and destabilization of critical slopes and cliffs.
- Modification of surface hydrology due to the general downward migration of surface water through vertical fractures.
- Modification of groundwater hydrology including connection of previously separated aquifers, reduction in flows of seeps and springs which rely upon tight aquitards for their flow, and changes in recharge mechanisms.
Emissions of methane originating from the coal seam through open fissures to the surface or at least the base of the surficial soil which has been known to have deleterious effects on woody plants.

Because these renewable resources exist with and adjacent to the permit area, a subsidence control plan is required. This plan is presented in Section 525.400.

A great deal of baseline data is available from many mining settings to develop subsidence damage criteria for surface structures (Bhattacharya et al. 1984). The formation of cracks and fissures are the general effects of subsidence and can have minor deleterious effects on groundwater resources without any fissuring to the surface. In the arid areas of Utah, impacts to and modification of the groundwater regime can be disruption of flow from natural seeps and springs which rely on the permeability contrast of interbedded sandstones and shale for their flows. These water resources are generally near surface occurrences and are essentially surface waters and subject to the same limiting damage criteria as surface water bodies. Subsidence damage to surface water bodies has been studied by a number of workers including Dunrud (1976), Wardell and Partners (1976), and U.S. Bureau of Mines (1977). The result of the Wardell and Partners studies of subsidence effects in a number of countries indicates that the limiting strain for the onset of minor impacts to surface waters is approximately $5 \times 10^{-3}$. The SME Mining Engineering Handbook also suggests a limiting extension strain value of $5 \times 10^{-3}$ for pasture, woodland, range or wildlife food and cover.

Table 10.6.19 in the Mining Engineers Handbook suggests that the minimum safe cover required for total extraction of the coal resources under surface waters is approximately 60 times the seam thickness for coal beds at least 6 feet thick or approximately 450 feet. In their review of the foregoing, Singh and Bhattacharya (1984) recommended that the same limiting safe strain values and cover thickness ratios be used for protecting groundwater resources and recharge areas over coal mines. Where extension strain is greater than this limiting value, it is likely that surface fissures and cracks may develop. As the strain value decreases below the limiting value, the potential for surface damage decreases.
Figure 1 in Appendix 7-3 shows a typical subsidence profile. As shown in Figure 1, the zones are: a caved zone that occurs in the six to 10 times the thickness of the coal seam, a fractured zone which occurs 10 to 30 times the thickness of the coal seam, and deformation zone which occurs 30 to 60 times the thickness of the coal seam, and finally, a soil zone which occurs on the ground surface. The cover thickness of 1,000 to over 2,000 feet, over most of the mine area is also much greater than the limiting thickness of 630 feet recommended by International Engineers Inc. (1979) (10.5' x 60).

The Lila Canyon mine will be a longwall operation. As projected, 15 longwall panels at various depths will be mined. The longwall panels are laid out with the gate roads running along the strike roughly north-south, which will result in the longwall shear cutting up and down the dip. The depth of cover over the longwall panels approaches but never gets less than 500 feet toward the southwest and increases to over 2500 feet in the northeast. Only three of the 13 planned longwall panels are under less than 1,000 feet of cover. The remaining 10 panels are under 1,000 plus feet of cover. Maximum subsidence is expected to be approximately 9.5 feet in the areas approaching 500 feet of cover and less than 3' in the deeper cover areas. Extension strain varies from 12.4 x10^-3 in the 500 foot cover areas to .9 x 10^-3 in the 2,500 foot cover areas. Extension strain values of 5.0 x 10^-3 and above occurs in areas of approximately 1000' of cover and less.

A typical longwall panel at the Lila Canyon Mine will have dimensions of approximately 950 feet wide and up to 7,000 feet long and 2,000 feet deep. Using the methods described in the National Coal Board's Subsidence Engineers' Handbook, the S/m ratio for this geometry would be 0.38 where "S" is the maximum subsidence and "m" is the seam extraction thickness. For an average seam extraction thickness of 10.5 feet, the total subsidence would be 4.0 feet. However, as described above, the major impacts of this subsidence are due to extension strains and not total vertical subsidence. The prediction of average extension strain is accomplished with the use of the formula:

\[ +E = 0.75 \frac{S}{h} \]

where S=subsidence, and h=depth of cover

**NOTE:** The .75 factor is only an average. The factor changes with various w/h ratios. Figure 15

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found in NCB's Subsidence Engineers Handbook takes into account the w/h ratio.

The solution of this equation for the Lila Canyon Mine configuration discussed above produces a predicted, average extension strain of $1.5 \times 10^{-3}$ which is less than the limiting strain of $5 \times 10^{-3}$ for protecting surface waters, groundwater sources, pasture, woodland, range or wildlife food and cover. Thus, it is unlikely that the gradual compression expected over much of the subsidence area will have any deleterious effects on the overlying renewable surface resources.

The table below shows the expected subsidence amounts and expected extension strain for longwall panels at various mining depths. These calculations were done for a flat multiple seam mining. There are adjustments for single seam mining and for dipping seams. However, these adjustments are minor and are not expected to result in significant changes in values.
The most favored technique until recently has been the use of the empirical charts developed by the National Coal Board (NCB). The above calculations were obtained using the empirical charts developed by the National Coal Board (NCB). Comparisons, as stated in the SME handbook, of US subsidence data with NCB predictions highlight the following differences between coalfields in the US and UK: Most of the studies in the US are limited to the Eastern US coalfields with a very limited data base applicable to western conditions.

With the exception of Illinois, maximum subsidence factors observed in US coalfields are less than predicted by NCB.

The limit (draw angles in the US coalfields tend to be less than the...
degree value generally accepted by NCB.

The points of inflection of the subsidence profiles over US coal mines are generally closer to the panel centerline compared to the NCB profile. This effect is dependent not only on the percentage of competent strata in the overburden but also on their locations relative to the ground surface and their thickness.

Surface strains and curvatures observed over US longwall panels have been shown to be significantly higher than NCB predictions, almost four times larger in many cases.

The pace at which subsidence occurs depends on many controls including the type and speed of coal extraction, the width, length and thickness of the coal removed, and the strength and thickness of the overburden. Observations of subsidence by Dunrud over the Geneva and Somerset Mines indicate that subsidence effects on the surface occurred within months after mining was completed, and the maximum subsidence was essentially completed within 2 years of the completion of retreat mining.

Dr. Roy Sidle found in his study of Burnout Creek that subsidence impacts to streams are temporary and self-healing.

The Sidle Study is representative of the conditions found in the Lila area because:

- the lithology is very similar between the Book Cliffs and the Wasatch Plateau
- the cover thickness ranges from 600 - 800 feet which falls within the range expected at Lila, and
- the seam thickness of 8-10 feet is in the same range expected at Lila.

An Executive Summary of his study and published findings follows:

Title: Stream response to subsidence from underground coal mining in central Utah

5. Authors: Sidle-RC Kamil-I Sharma-A Yamashita-S
Short-term geomorphic and hydrologic effects of subsidence induced by longwall mining under Burnout Creek, Utah were evaluated. During the year after longwall mining, 0.3-1.5 m of subsidence was measured near impacted reaches of the mountain stream channel. The major channel changes that occurred in a 700-m reach of Burnout Creek that was subsided from 1992 to 1993 were: extent glides; (2) increases in pool length, numbers and volumes; (3) increases in median particle diameter of bed sediment in pools; and (4) some constriction in channel geometry. Most of the changes appeared short-lived, with channel recovery approaching pre-mining conditions by 1994. In a 300-m reach of the South Fork drainage that was subsided from 1993 to 1994, only channel constriction was observed, although any impacts on pool morphology may have been confounded by heavy grazing in the riparian reaches during the dry summer of 1994. Similar near-channel sedimentation and loss of pool volume between 1993 and 1994 were noted throughout Burnout Creek and in adjacent, unmined James Creek. Subsidence during the 3-year period had no effect on baseflows or near-channel landslides.

No major impacts of subsidence to the surface, caused by the underground mining methods proposed during the permit term are anticipated.

The coal seam is approximately 12.5 feet thick with only about 10.5 feet being extracted, and the depth of cover ranges from 0' to approximately 2,500'. The rocks overlaying the coal seam are sandstones and mudstones with some thin bands of coal. Due to the strength of the overburden, and depth of workings, even with full seam extraction, only minimal subsidence, if any, is anticipated. Some surface expressions of tension cracks, fissures, or sink holes may be experienced, but should be insignificant. The chances of subsidence-related damage to any perceived renewable resource is minimal.

All dirt roads above the mine are in areas in excess of 1,000 feet of cover or in areas where mining will not take place. The chance of subsidence negatively effecting these dirt roads is minimal. However, in the unlikely event that cracks, fissures or sink holes are observed as a result of subsidence, the road will remain accessible by
regrading and filling in the cracks, fissures or sinkholes.

The unnamed ephemeral channel in the southwest corner of the permit area is located in an area where no mining is planned or over the top of a bleeder system that will not be second mined. The chance of subsidence negatively effecting this ephemeral channel is minimal. However, in the unlikely event that cracks, fissures or sink holes are observed as a result of subsidence the channel will be regraded and the cracks, fissures or sinkholes will be filled in by hand methods due to its inaccessibility.

A small portion of Little Park Wash, which is ephemeral, has less than 1,000 feet of cover in the southwest corner of the permit area. The portion with less than 1,000 feet of cover runs diagonally across one longwall panel and then parallel to the bleeder system in the second longwall panel. In the unlikely event that cracks, fissures or sink holes are observed as a result of subsidence the channel will be regraded and cracks, fissures or sinkholes will be filled in. Since this stream channel is accessible and is traversable by 4 wheel drive, access for repairs would not be a problem. If any subsidence repairs cannot be fixed using hand methods, small earth moving equipment could be used.

DWR and BLM Wildlife Biologists, in consultation with the Division, have determined that any loss of snake dens to subsidence would be random and a minor impact to the population of snakes.

A survey was conducted within the proposed permit area and adjacent area and it was determined that limited renewable resource lands exist within the area surveyed. Limited areas were found which contribute to the long-range productivity of water supply or fiber products. No structures exist within the permit area in which subsidence, if it occurred.
could cause material damage or diminution for reasonably foreseeable use. See Plates 5-5 and 5-3 for areas of potential subsidence. Identification and data for the State appropriated water supplies can be found in chapter 7 section 727.

All State Appropriated water rights within the maximum limit of subsidence that could be affected, are either owned by the Operator or by the BLM. The BLM has been notified of the water rights survey by means of the submittal of the permit application.

According to Mark Page (State Water Rights), there is not a water conversation district associated with Lila Canyon Mine.

525.200. Protected Areas

525.210. Since there are no public buildings or other facilities such as churches, school or hospitals, and since there are no impoundments with a storage capacity of more than 20 acre-feet, this section does not apply.

525.220. Since R645-301-525.210 does not apply, this section does not apply.

525.230. Since there are no planned operations under urbanized areas, cities, towns, and communities, or adjacent to industrial or commercial buildings, major impoundments, or perennial streams this section does not apply.

525.240. A detailed plan of the underground workings, including maps and descriptions of significant features of the underground mine, including the size, configuration, and approximate location of pillars and entries, extraction ratios, measures taken to prevent or minimize subsidence, and related damage, and areas of full extraction can be found in

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the R²P² on file with the BLM local and state offices.

525.300. Subsidence control.

525.310. Measures to prevent or minimize damage.

525.311 No attempt will be made to prevent subsidence in any area except where the escarpment near the outcrop is to be protected and to insure that subsidence remains within the permit area. The use of continuous miners in a pillar section as well as longwall technology provides for planning subsidence in a predictable and controlled manner. Some surface expressions of tension cracks, fissures, or sink holes may be experienced but should be insignificant. The chances of subsidence related damage to any perceived renewable resource is minimal. The value and foreseeable use of the surface lands will not be affected by potential subsidence.

525.312 Since there are no buildings or occupied residential dwellings or structures within the Lila Canyon project area this section does not apply.

525.313 Room-and-pillar mining in addition to longwall methods will be used at the Lila Canyon Mine.

525.400. Since state-appropriated water supplies exist on the surface, 525.400 has been addressed.

525.410 Coal will be removed using a combination of continuous miner and long wall methods as described in sections 522 and 523. Sequence and timing for the development of underground workings are also discussed in sections 522 and 523.
Plate 5-5 shows the underground workings, and depicts areas where first mining or partial mining will be utilized to protect the escarpment and raptor nests that may exist on the escarpment, and to insure that subsidence remains within the permit area. State-appropriated water rights are shown on Plates 5-3, 5-5 as well as Plate 7-1.

No major impacts of subsidence to the surface caused by the underground mining methods proposed during the permit term are anticipated.

The coal seam is approximately 12.5 feet thick with only about 10.5 feet being extracted, and the depth of cover ranges from 0' to approximately 2,300'. The rocks overlaying the coal seam are sandstones and mudstones with some thin bands of coal. Due to the strength of the overburden and depth of workings, even with full seam extraction, only minimal subsidence, if any, is anticipated.

Aerial subsidence monitoring will be done annually while the significant subsidence is taking place. The subsidence monitoring will be initiated in an area prior to any 2nd mining being done within that area. Initially a 200 foot grid along with baseline photograph will be established prior to any 2nd mining. Approximately 12-16 control points will be needed to cover the total mining area. Six of these points will be located outside of the subsidence zone. The accuracy of this survey will be plus or minus 6" horizontally and vertically. From this data a map will be created that will show subsided areas. Once per year a follow up aerial will be performed to determine the extent and degree of active subsidence. Subsidence monitoring will continue for a minimum of 5 years after the mining ceases. If at the end of the 5 year period the annual subsidence in any of the 3 prior years measures more than 10 percent of the highest annual subsidence amount, subsidence monitoring will continue until there are 3 consecutive years where the annual subsidence amount is less than 10 percent of the highest annual...
subidence amount. If for three years in a row the subsidence is measured to be less than 10% of the highest subsidence year, subsidence will be determined to be complete, and no additional monitoring for that area will be required.

"A ground survey of the mine permit area 'where secondary extraction has occurred over the last year' will be conducted in conjunction with the quarterly water monitoring program." Identified features will be monitored until they are repaired or self-healed. The survey will be conducted on roads, adjacent to stock watering ponds, and in drainage channels where they cross tension areas relative to the underground extraction areas."

"The results of this survey will be documented quarterly in a written report which provides global positioning co-ordinates as well as the following information;

A) a description of the identified subsidence related feature,
B) length, and width measurements, and compass bearing,
C) dated photographic documentation,
D) located on a topographic overlay map of the underground disturbed area.
E) if the feature is determined as significant, the Division will be notified within a 48 hour period.
F) A written report, compiling the four quarterly reports for the monitoring year, will be submitted as part of the Annual Report required by the Division.
G) The commitment "to restore the land where subsidence damage has affected the use of the surface" must be revised to read "to restore the land where subsidence damage has been determined as significant enough to require repair, as determined by the Division".

Two areas of the permit have stream reaches with
less than 1,000 feet of cover over the coal seam. As discussed in Section 525.120, it is not envisioned that subsidence will negatively impact these areas. During periods of 2nd mining under areas of intermittent or perennial streams, a ground survey will be conducted of the stream channels every two weeks. These ground surveys will be continued for a period of 3 months following the 2nd mining.

The ground survey will consist of walking and photographing the various areas of the surface over the mine where subsidence might occur. If evidence of subsidence is identified, the area of subsidence will be surveyed and the extent of the disruption identified. Depending on the extent and location of the damage, mitigation measures will be reviewed and implemented. Due to the fact that mitigation options change with time as new technology and measures are developed, better options may be implemented in the future. However, UEI provides a commitment that where subsidence damage affects uses of the surface, the land will be restored to a condition capable of maintaining the value and reasonable foreseeable uses which it was capable of supporting before the subsidence. The surface effects will be repairs as described in Section 525.500.

525.450 Subsidence control measures.

525.451. No backstowing or backfilling of voids used as a subsidence control measure is planned at this time. Therefore, this section is not applicable.

525.452. Support pillars as a subsidence control measure is not anticipated at this time. However, an area of partial mining where an unmined coal block will be left for subsidence control is shown on Plate 5-5. First mining indicates an area where a block of coal is roomed leaving pillars for support with no mining of the remaining pillars. Partial mining as shown on Plate 5-5 indicates an area
where a block of coal has been isolated without the rooms being developed. Both first mining and partial mining will leave support that can be used to control subsidence. If the partially mined area shown on Plate 5-5 is ever roomed out, the area now defined as partially mined would become an area defined as being first mined.

525.453. An outcrop barrier of coal will be left to protect the escarpments at the outcrop. As per the R2P2, only first mining will be allowed within 200' of the outcrop. Mains, submains, and ventilation portals will be allowed within the outcrop.

525.454 No measures will be taken on the surface to prevent material damage or lessening of the value or reasonable foreseeable use of the surface.

525.454. Anticipated effects of planned subsidence may include tension cracks, fissures, or sink holes. Areas of minimal ground lowering may be anticipated. The chances of subsidence-related damage to any perceived renewable resource is minimal.

525.460 Since no urbanized areas, cities, towns, public buildings, facilities, churches, schools, or hospitals exist within the permit area this section does not apply.

525.470 There are no plans to change or modify the mining plan to protect any springs or seeps. Springs with water rights will be monitored for flow and quality as described in Chapter 7 Section 731.211. UEI has committed to provide for mitigation of any lost water rights as per Chapter 7 Section 727.

525.480 Other information specified by the Division as necessary to demonstrate that the operation will be conducted in accordance with R645-301-525.300 will be provided.

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525.500. Repair of damage.

525.510. If effects of subsidence are confirmed, any material damage to the surface lands will be restored to the extent technologically and economically feasible. The land will be restored to a condition capable of maintaining the value and reasonable foreseeable uses which it was capable of supporting before the subsidence.

525.520. Since no structures exist within or adjacent to the permit area which could be damaged by subsidence, should it occur, this section does not apply.

525.530. The Little Park Road exists in the subsidence zone. In the unlikely event the road is damaged by subsidence, UEI will repair the damage as per Section 525.120.

525.600. Public Notice.

At least six months prior to mining, or within that period if approved by the Division, the underground mine operator will mail a notification to all owners and occupants of surface property and structures above the underground workings. The notification oil include, at a minimum, identification of specific areas in which mining will take place, dates that specific areas will be undermined, and the location or locations where the operator's subsidence control plan may be examined.

526. A narrative explaining the construction, modification, use, maintenance and removal of the mine facilities follows. Additional information can be found in Appendix 5-4 and Chapter 8.

526.100 Mine Structures and Facilities.

526.110 The only existing structures are found in Horse Canyon (Part "A" of this permit) and are the remains of the United States Steel Corporation Horse Canyon.
Canyon has received phase II bond release, and the remaining structures have been left in place for future use. Only three existing structures, a 60" and a 48" CMP culverts located near the new proposed surface facilities, and the County road on top of Little Park, can be found within the Lila Canyon Permit. The existing culvert is shown on plate 5-1A. The existing road on Little Park can be found on Plate 5-1 as well as most other plates showing the surface area of the Lila Canyon Permit. Several vehicle ways will be used for water and subsidence monitoring. These ways branch off the Little Park Road and generally follow the ephemeral drainages. The ways are shown on Plate 5-1 as well as most other plates showing the surface area of the Lila Canyon Permit. More detail of the existing Little Park Road can be found in Appendix 5-4.

526.111 The location of the existing culverts is shown on Plate 5-1A.

526.112 Most of the existing 48" culvert is outside the permit boundary and is Emery County's responsibility. UEI will grade the site so that during reclamation and operations surface flows will be directed away from the 48" culvert. The 60" culvert is in poor condition and will be replaced by the County. UEI will add on to the culvert during the operation and reclamation phase. The bottom 30' is the responsibility of the County, the upper portion is the responsibility of UEI.

526.113 It is believed that the existing culverts were installed with the road construction around 1940.

526.114 Since the existing culvert is going to be removed upon construction of the sediment pond, this section does not apply.

526.115 Since the existing culvert is going to be removed upon construction of the sediment pond, this section does not apply.
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pond, this section does not apply. The County road and the culvert within the disturbed area boundary will be modified or reconstructed by the County.

526.115.1. Since the existing culvert is going to be removed upon construction of the sediment pond, this section does not apply. See Appendix 5-4 for existing road details.

526.115.2. Since the existing culvert is going to be removed upon construction of the sediment pond, this section does not apply. See Appendix 5-4 for existing road details.

526.115.3. Since the existing culvert is going to be removed upon construction of the sediment pond, this section does not apply. See Appendix 5-4 for existing road details.

526.115.4. Since the existing culvert is going to be removed upon construction of the sediment pond, this section does not apply. See Appendix 5-4 for existing road details.

526.116 The only coal mining and reclamation operations that are planned within 100 feet of the County Road are an office complex, sediment ponds, topsoil pile, and security shack. The permit area adjacent to the county road will be fenced to protect the public from the sediment pond and other mine associated buildings. Other than fencing, no additional measures are planned after the construction phase. During construction, measures to control traffic on the County Road will be taken to protect the public from construction related hazzards.

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526.116.1. A cooperative agreement with Emery County, as stated in Appendix 1-4, requires a six foot chain link fence to be constructed adjacent to the Lila Canyon Road to provide safety to the general public in the proximity to the mine site and mine related structures and activities.

526.116.2. At the current time, there are no plans to relocate any public road.

526.200 Utility Installation and Support Facilities.

526.210 All coal mining and reclamation operations will be conducted in a manner which minimizes damage, destruction, or disruption of services provided by oil, gas, and water wells, oil, gas, and coal-slurry pipelines, railroads, electric and telephone lines, and water and sewage lines which may pass over, under, or through the permit area, unless otherwise approved by the owner of those facilities and the Division. Since no existing services are found within the projected disturbed area, no negative impact to any service is anticipated.

526.220 The new support facilities are described in section 520 and in Appendix 5-4 and shown on plate 5-2 and will be operated in accordance with the mine reclamation plan. Plans and drawings for each support facility to be constructed, used or maintained within the permit area are found in Appendix 5-4, Plates 5-7A, 5-7B, and 5-8.

526.221 The new facilities designs shown in Appendix 5-4 prevent or control erosion and siltation, water pollution, and damage to public or private property, and:

526.222 The new facilities designs shown in Appendix 5-4 minimize damage to fish, wildlife, and
related environmental values; and minimize additional contributions of suspended solids to stream flow or runoff outside the permit area to the extent possible by using the best technology currently available. Islands of undisturbed areas within the permit area will be visually monitored for coal fines deposition. If monitoring reveals coal fine deposition, then water sprays on the area from which the fines are originating will be warranted as per the August 27, 1999 Approval Order.

526.300 Water pollution control facilities consist of sedimentation control and properly designed sewage systems.

The sedimentation control is accomplished by containing all disturbed area runoff in a properly sized sedimentation pond. Complete designs are presented in Appendix 7-4 and on Plate 7-6.

The sewage system will consist of a septic tank and drainfield. Complete designs are presented in Appendix 5-4.

The drain field design and layout are shown on plate 5-2, and details are shown in Appendix 5-4.

526.400 Since Lila Canyon Mine is an underground operation, this section does not apply.

527. Transportation Facilities.

527.100 All new roads within the disturbed area have been classified as primary.

527.110 See Sections 527.120 and 527.130.

527.120 The Slope Access Road / Portal Access Road and the Mine Facilities Road / Truck Loadout Road will be used frequently for access for a period in excess of six months, and or will transport coal. They are classified as primary roads.
527.121 See 527.120 above.

527.122 See 527.120 above.

527.123 Since none of the new roads planned within the disturbed area will be retained for an approved postmining land use, this section does not apply.

527.130 There are no ancillary roads within the disturbed area.

527.200 A detailed design and description for each road, and conveyor to be constructed, used, and maintained within the proposed permit area is included in Appendix 5-4. The roads are shown on Plate 5-2.

527.210 The specifications for each road width, road gradient, road surface, road cut, fills, embankments, culverts, drainage ditches and drainage structures are shown on Plate 5-2 and in Appendixes 5-4 and 7-4.

527.220 Since no alteration or relocation of natural drainage ways is anticipated, this section is not applicable.

527.230 Roads shall be maintained in manner that allows them to meet their design standards throughout their use.

527.240 If any of the roads on the disturbed area is damaged by a catastrophic event, the road will be repaired as soon as practical after the damage has occurred.

527.250 Steep cut slopes or requests for alternative specifications are not anticipated at this time therefore this section does not apply.

528. Handling and Disposal of Coal, Overburden, etc:

A narrative explaining the construction modifications, use, maintenance and removal of coal, overburden, excess spoil and coal mine waste.

528.100 Coal will be mined using continuous miners and longwall equipment. The coal will be transported from the face and deposited on the underground mine belts using shuttle cars or continuous haulage equipment. The coal will be transported by a series of conveyor belts from the section to the run...
of mine stockpile. The coal will be removed from the run of mine stockpile by a reclaim belt to an enclosed crusher/screen. Once crushed the coal will be conveyed to a storage bin from which it will loaded in to coal haul trucks for transportation to a unit train loadout.

528.200 Overburden: Lila Canyon is an underground operation, and it is not anticipated that any material that overlays the coal seam, consolidated, or unconsolidated, other than topsoil, will be disturbed. Therefore, this section does not apply.

528.300 Spoil, coal processing waste, mine development waste, and noncoal waste removal, handling, storage, transportation, and disposal areas and structures are discussed below.

528.310 Excess Spoil: Since Lila Canyon is an underground operation, it is not anticipated that any spoil will be generated. Therefore, this section does not apply.

528.320 Coal Mine Waste: All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface. Any oversized coal chunks from the screens will be crushed and put back into the ROM stream. The temporary mine development waste pile and slope rock disposal area are shown on Plate 5-2 and in Appendix 5-7.

528.321 Coal processing waste produced from the screen will not be returned to any abandoned underground workings. Any and all of the coal processing waste from the screen will be crushed and reintroduced into the ROM stream for sale.

528.322 Refuse Piles. Each pile will meet the requirements of MSHA, 30 CFR 77.214 and 30 CFR 77.215, meet the design criteria of R645-301-210, R645-301-512.230, R645-301-513.400, R645-301-514.200, R645-301-515.200, R645-301-528.320, R645-301-536 through R645-301-536.200, R645-301-536.500, R645-301-536.900, R645-301-553.250, R645-301-746.100, R645-301-746.200, and any other applicable requirements.

528.323 Burning and Burned Waste Utilization.

528.323.1. Coal mine waste fires will be extinguished by the person who conducts coal mining and reclamation operations, in accordance with a plan approved by the Division.
and MSHA. The plan will contain, at a minimum, provisions to ensure that only those persons authorized by the operator, and who have an understanding of the procedures to be used, will be involved in the extinguishing operations. The coal mine waste fire plan can be found in Appendix 5-3. MSHA approval is not required unless you have an actively burning fire. (Phone conversation with Billy Owens MSHA Denver 5/31/05)

528.323.2. No burning or burned coal mine waste will be removed from the permitted disposal area.

528.330 Noncoal Mine Waste.

528.331 Noncoal mine wastes including, but not limited to, grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber and other combustible materials generated during mining activities will be placed and stored in a controlled manner in a designated portion of the permit area. The noncoal mine waste will be placed in dumpsters and emptied on a as needed basis. The designated noncoal waste area (concrete trash chute) is shown on Plate 5-2. Circumstances may arise where equipment must be abandoned underground. If this circumstance arises, the operator must get approval from the BLM and the Division prior to abandoning equipment in place.

UtahAmerican Energy, Inc. is abandoning the current set of 106 DBT longwall shields upon completion of Panel #6. From Panel #7 going forward in the mine plan, a new set of longwall equipment will be installed and utilized for coal extraction. Every component from our current longwall installation including the shearer, pan line, conveyor chain, stage loader, crusher, current belt installation, and associated belting in Panel #6 will be recovered except for the 106 longwall shields. In order to avoid any adverse environmental impacts from the shields, the mine will run water through the shields as opposed to emulsion in the last few passes of production to remove any oils before the recovery process proceeds. These shields would be abandoned in the mine under 1000 feet of cover, with no foreseen environmental impacts to ground water due to the depth of cover and grade of the coal seam. Although a longwall move is routine, completed safely, and occurs several times a year at Lila Canyon, there is inherent exposure that is associated with a longwall move. By not extracting these shields and leaving them in the mine, this removes any opportunity for an accident as a result of the longwall move. Upon completion of mining in District #2 the shields will be behind seals for the remainder of the mine life. See plate 5-5a.

528.332 It is anticipated that final disposal of noncoal mine wastes will be at the
ECDC facility near East Carbon City. Concrete will be disposed of in a specified area, refer to Plate 5-6 for this location. The disposal site will be located under the reclaimed coal stockpile. This area will receive the maximum fill during reclamation. Placement of this fill around the concrete will help to eliminate runoff. This will ensure that leachate and drainage does not degrade surface or underground water. The noncoal mine waste will be placed in dumpsters and emptied on an as-needed basis.

528.333 The noncoal mine waste will be disposed of at the ECDC facility near East Carbon City.

528.334 Notwithstanding any other provision to the R645 Rules, any noncoal mine waste defined as "hazardous" under 3001 of the Resource Conservation and Recovery Act (RCRA) (Pub. L. 94-580, as amended) and 40 CFR Part 261 will be handled in accordance with the requirements of Subtitle C of RCRA and any implementing regulations.


528.350 A description of measures to be employed to ensure that all debris, acid-forming and toxic-forming materials, and materials constituting a fire hazard are disposed of in accordance with R645-301-528.330, R645-301-537.200, R645-301-542.740, R645-301-553.100 through R645-301-553.600, R645-301-553.900, and R645-301-747 is included.

528.400 Dams, embankments and other impoundments. See Section 700 and Appendix 7-4.
529. Management of Mine Openings:
The permit application includes a description of the measures to be used to seal or manage the openings within the proposed permit area. New slope or drift openings required to be sealed shall be sealed with solid, substantial, noncombustible material for a distance of at least 25 feet into such openings. The closure design for portals, slopes, and drifts, can be found in Appendix 5-6.

529.100    Shafts or other exposed underground opening when no longer in use will be cased, lined, or otherwise managed as approved by the Division. All openings exposed by mining operations within the permit area will be permanently closed unless approved for water monitoring.

529.200    For the purposes of Underground Coal Mining and Reclamation Activities:

529.210    Mine entries which are temporarily inactive, but have a further projected useful service under the approved permit application, will be protected by barricades or other covering devices, fenced, and posted with signs, to prevent access into the entry and to identify the hazardous nature of the opening. These devices will be periodically inspected and maintained in good operating condition by the person who conducts the activity.

529.220    Since no portals are projected to return underground development waste, coal processing waste or water to the mine, this section does not apply. There is no current need to return any waste to the underground workings.

529.300    Section 529 does not apply to holes drilled and used for blasting.

529.400    No openings have been identified for use to return coal processing waste to underground workings. Therefore, this section is not applicable.

531. General plans for the sediment pond and refuse pile are found within this section.

532. Sediment control measures can be found in Chapter 7.

532.100 The smallest practicable area will be disturbed during the life of the project. Progressive backfilling, grading, and prompt revegetation of applicable will be completed as per R645-301-353.200.

532.200 Backfilled material will be stabilized to promote a reduction of the rate and volume of runoff in accordance with R645-301-537.200, R645-301-552 through R645-301-553.230, R645-301-553.260 through R645-301-553.420, R645-301-553.600, and R645-301-553.900.

533. Impoundments.

533.100 Since no impoundments meeting the criteria of 30 CFR 77.216(a), this section does not apply.

533.200 Two impoundments are planned for this site: Pond #1 and Pond #2. The sediment ponds are temporary structures. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1; and on Plates 7-6a and 7-6b.

533.210 The sediment ponds will be incised, except for the dam/road embankment. This embankment will be reconstructed and compacted to at least 95%. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1; and on Plates 7-6a and 7-6b.

533.220 Where fill is to be placed, natural ground shall be removed 12" below the structure. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1; and
on Plates 7-6a and 7-6b.

533.300 Rip-rap or other protection (culverts, concrete) will be placed at all inlets and outlets to prevent scouring. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1. Also see Plates 7-6a and 7-6b.

533.400 External slopes of the impoundment will be planted with an approved seed mix to help prevent erosion and promote stability. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1; and on Plates 7-6a and 7-6b.

533.500 This section does not apply. There are no vertical highwalls associated with this impoundment.

533.600 Since no impoundments are planned that meet the criteria of MSHA, 30 CFR 77.216(a), this section does not apply.

533.700 Design and construction requirements, as well as operation and maintenance requirements, are detailed in Appendix 7-4, Section 3.1.

534. Roads. The designs for surface roads can be found in Appendix 5-4.

534.100 The roads have been designed, located, constructed and will be maintained to:

534.110 The roads have been designed, located, constructed and will be maintained to prevent or control damage to public or private property.

534.120 Non-acid or nontoxic-forming substances will be used in road surfacing.

534.130 The designs for the roads can be found in Appendix 5-4.

534.140 The reclamation plan for the roads can be found in section 542.600.
The roads have been designed to prevent or control erosion, siltation and air pollution.

Appropriate limits for grade, width, and surface materials have been used in the design of the roads.

Primary Roads. Primary roads will meet the requirements of R645-301-358, R645-301-527.100, R645-301-527.230, R645-301-534.100, R645-301-534.200, R645-301-542.600, R645-301-542.600, and R645-301-762, and any necessary design criteria established by the Division, and the following requirements.

Primary roads will:

The roads will be located insofar as practical, on the most stable available surfaces.

The roads will be surfaced with rock, crushed gravel, asphalt, or other material approved by the Division as being sufficiently durable for the anticipated volume of traffic and the weight and speed of vehicles using the road;

The roads will be routinely maintained to include repairs to the road surface, blading, filling potholes and adding replacement gravel or asphalt. It will also include revegetating, brush removal, and minor reconstruction of road segments as necessary.

Culverts, if required, will be designed, installed, and maintained to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road.

It is anticipated that no spoil will be produced at the Lila Canyon Mine. Therefore, this section is not applicable.

The proposed Lila Canyon Mine could produce 2 separate types of coal mine waste:

1. Normal coal processing waste or refuse and:
2. Underground development waste (rock slope)
All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface. The rock slope material / underground development waste will be examined and tested as necessary to determine acid- or toxic-forming potential.

536.100 All underground development waste, other than the rock slope material, will be brought to the surface and will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface.

536.110 The refuse pile will be designed to attain a minimum long-term slope stability safety factor of 1.5. See Appendix 5-7.

536.200 Underground development waste brought to the surface will be deposited according to the plan described in Appendix 5-7.

536.300 Since no spoil fills will be generated this section does not apply.

536.400 Since there will not be any impounding structures constructed of coal mine waste this section does not apply.

536.500 As discussed in Section 536 and 536.300, it is proposed to dispose of the rock slope material / underground development waste within the rock disposal area and be used as structural fill as shown on Plate 5-2.

536.510 It is not anticipated that coal mine waste materials from activities located outside the permit area be disposed of in the permit area. Therefore this section does not apply.

536.520 It is not anticipated that coal mine waste will be brought to the surface then taken back underground for disposal therefore this section does not apply.
536.600 In areas where slope rock or coal processing waste is deposited, the topsoil will be removed and stored in the topsoil stockpile area until reclamation.

536.700 It is not anticipated that coal processing waste will be returned to abandoned underground workings therefore this section does not apply.

536.800 Since no coal processing waste banks, dams, or embankments are planned for the Lila Canyon Mine therefore, this section does not apply.


537. Regraded Slopes.

537.100 Each application will contain a report of appropriate geotechnical analysis, where approval of the Division is required for alternative specifications or for steep cut slopes under R645-301-358, R645-301-512.250, R645-301-527.100, R645-301-527.230, R645-301-534.100, R645-301-534.200, R645-301-534.300, R645-301-542.600, R645-301-742.410, R645-301-742.420, R645-301-752.200, and R645-301-762.

540. Reclamation Plan. (See Appendix 5-8 for reclamation plan.)

541. General.

541.100 The operator is committed to performing all reclamation as in accordance with R645 rules.

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541.200. N/A. The operator is not involved in surface mining activities.

541.300. The operator is committed to the removal of all equipment facilities and structures upon cessation of mining activities.

541.400. The operator will address all reclamation activities as referenced in Chapter 5 of this document.

542 Narratives, Maps and Plans.

542.100. See Table 3-3 time table based on project reserves markets and life of mine.

542.200. The perimeter of the disturbed area contains approximately 40.12 surface acres within the disturbed area but only 33.99 acres will be disturbed, leaving 6.13 acres of undisturbed islands within the disturbed area. The following R645 regulations will give detailed description and reclamation procedures to address these areas of disturbance. The reclamation plan for the sediment pond and drainage control structures can be found in Appendix 7-4.

Topsoil amounts can be found in Section 232.100 and are calculated from Plate 2-3. Concrete amounts can be calculated from the text in Section 520. Coal Mine Waste volumes can be found in Appendix 5-7. Volumes were calculated using a Cad system.

542.300. Included.

542.310. Included. (See Plates 5-6 & 7-7)

542.320. There will not be any surface facilities left post mining.
542.400. Not applicable. No surface facilities will remain post bond liability period.

542.500. A reclamation time table is included as Table 3-3.

542.600. All roads within the disturbed area will be reclaimed immediately after they are no longer needed for mining and reclamation operations, except for the upgraded portion of County Road #R.S. 2477. At the time of reclamation, the Bureau of Land Management (BLM) and Emery County will be given the option of keeping the upgrades to this portion of the roadway, reclaim the roadway to its original condition. The Division will be notified of the final decision.

542.610. The time table of reclamation activities will enable the roads to be removed concurrently with reclamation activities. So, no closures specific to traffic would be anticipated except for the upgraded portion of the Emery County Road #R.S. 2477. Minimal closures may be required for the upgraded portion, if it is reclaimed.

542.620. All bridges and culverts will be removed concurrent with reclamation.

542.630. All disturbed areas will be ripped and top soiled prior to revegetation activities in compliance with all applicable R645 regulations. (See Appendix 5-8)

542.640. Road surfacing materials such as sand and gravel.
which are not suitable for revegetation establishment, will be buried on site and covered with a minimum of two feet of material that would support vegetation. Concrete will be disposed of in the designated area and covered with four feet of cover. Asphalt will be disposed of off site, either in a landfill or sent to a recycling facility.

542.700. Final Abandonment of Mine Openings and Disposal Areas.

542.710. Appendix 5-6 depicts a typical seal that will be constructed at all mine openings.

542.720. No excess spoil is anticipated at this time.

542.730. All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface.


542.741. All non coal waste will be temporarily stored on site in approved waste bins and commercially picked up and transported to an approved disposal site. Non Coal waste generated during reclamation (such as concrete structure, buried culverts, utility lines, septic systems etc.) will be buried in the refuse disposal area and covered with a minimum of four feet of fill.
542.742. No noncoal waste will be stored on site or disposed of on site during the life of the mine.

542.800. A detailed cost break down is included in Chapter 8, Appendix 8-1 relative to bonding.

550 Reclamation Design Criteria and Plans. Each permit application will include site specific plans that incorporate the following design criteria for reclamation activities.

551. All underground openings will be sealed as detailed in Appendix 5-6.

552. Permanent Features.

552.100. In the course of reclamation, areas that have been recontoured and top soiled will be “pock-marked,” creating small basins that will facilitate vegetation establishment as well as minimizing erosion.

552.200. No permanent impoundments will be left post reclamation.

553. The operator will comply with all regulations applicable to underground mining activities relative to backfilling and grading as required by R645 regulations.

Some minor cut slopes along the reclaimed road may be left after reclamation due to the difficulty and inability to reclaim all material pushed over the side while making the road cut. See plate 5-7B-2, cross section 16+00 for details. UEI will make reasonable efforts to minimize the cut slopes being left.
553.100. Disturbed Areas. Disturbed areas will be backfilled and graded to:

553.110 The operator will obtain a post mining topography similar in form as what existed premining.

553.120 Since Lila Canyon is an underground operation, no spoil piles will be created. Minor highwalls may be created with the development of the rock slope portals. Upon completion of mining these entries will be sealed as per Closure for Mine Openings Appendix 5-6 and all highwalls will be eliminated during the reclamation phase of the operation. Plate 5-9 shows the proposed portal plan. During reclamation, suitable material will be placed against the portals. This material will be shaped to eliminate the highwall and to bring the slope back to the approximate original contour.

553.130 All fill slope will have a static safety factor of 1.3 as shown in Appendix 5-5.

553.140 Erosion and water pollution will be minimized on site by the use of drainage control structures (berms, channels and silt fence) and the use of small depressions, soil tackifiers, mulch and sediment pond design. No water is anticipated leaving the reclaimed site prior to adequate treatment in the form of retention and/or filtration that does not meet and/or exceed UPDES standards.

553.150 The post mining land use of wildlife and domestic grazing should be enhanced to some degree with the revegetation of a more desirable seed mix and a vegetative cover in excess of what was present premining.
553.200  Spoil and Waste.

553.210  All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface. Any oversized from the screens will be crushed and put back into the ROM stream.

553.220  Since no spoil will be produced this section does not apply.

553.221  All vegetation and/or organic material will be removed prior to any coal mine waste being stored.

553.222  All useable topsoil or topsoil substitute will be removed from the structural fill and refuse areas prior to use. Table 2-1 shows estimates of salvageable soil by soil type based on current NRCS soil inventories. The location of the soil storage is shown on Plate 5-2. This material will be spread over the recontoured structural fill and refuse areas prior to seeding and mulching.

553.223  Since no spoil will be produced this section does not apply.

553.230  All recontoured areas will be compacted to minimize slippage. The area will then be overlaid with topsoil and ripped. In addition the area will be "pock-marked" to minimize the potential for erosion, as well as enhance revegetation establishment. It is not anticipated that soil will be disturbed in areas too steep for equipment to operate.

553.240  The structural fill area will have slopes of less than 8% upon final recontouring, and
Horse Canyon Mine - Lila Canyon Extension

Utah American Energy Inc.

revegetated to enhance the post mining land use of grazing and wildlife habitat.

553.250 A need for a refuse pile at Lila Canyon is not anticipated.

553.260 The operator will commit to all applicable R645 regulations relative to disposal of coal processing waste.

553.300 All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface. Any oversized from the screens will be crushed and put back into the ROM stream.

553.400 Cut-and-fill terraces may be allowed by the Division

553.410 No cut and fill terraces will be required.

553.420 No terraces will be required for post mining land use.

553.500-540 and 553.600-553.650.500 The only area that falls under these provisions are the reclaimed Horse Canyon mine which lies in the north west portion of the lease area and is addressed under approved MRP Act #0013.

553.700-553.900 This operation will only involve underground mining, and as such the above referenced regulations do not apply.

560. Performance Standards. Coal mining and reclamation operations will be conducted in accordance with the approved permit and requirements of R645-301-510 through R645-301-553.

INCORPORATED

MAY 14 2019

Div. of Oil, Gas & Mining
APPENDIX 5-1

EXCESS SPOIL
OR
REFUSE PILE

INSPECTION FORM

Information for Appendix 5-1 is all hard copies no electronic copies exist.
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<th>Permit Number</th>
<th>Report Date</th>
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<tr>
<td>Company Name</td>
<td></td>
</tr>
<tr>
<td>Excess Spoil Pile or Refuse Pile Identification</td>
<td>Pile Name</td>
</tr>
<tr>
<td></td>
<td>Pile Number</td>
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<td>MSHA ID Number</td>
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<td>Inspection Date</td>
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<td>Inspected By</td>
<td></td>
</tr>
<tr>
<td>Reason for Inspection</td>
<td>Attachments to Report? □ No □ Yes</td>
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<tr>
<td>(Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)</td>
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</tr>
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</table>

### Field Evaluation

1. Foundation preparation, including the removal of all organic material and topsoil.

2. Placement of underdrains and protective filter systems.

3. Installation of final surface drainage systems.

4. Placement and compaction of fill materials.
Final grading and revegetation of fill.

6. Appearances of instability, structural weakness, and other hazardous conditions.

7. Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

Certification Statement

I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

By:

[Full Name and Title]

Signature: ___________________________ Date: ________________

P.E. Number & State: ___________________________
APPENDIX 5-2

IMPOUNDMENT

INSPECTION FORM

Information for Appendix 5-2 is all hard copies no electronic copies exist.
## IMPOUNDMENT INSPECTION AND CERTIFIED REPORT

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<thead>
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<table>
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<tr>
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### IMPOUNDMENT IDENTIFICATION

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<table>
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<tr>
<th>UPDES Permit Number</th>
<th>MSHA ID Number</th>
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## IMPOUNDMENT INSPECTION

### Inspection Date

<p>| | |</p>
<table>
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<tr>
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<td></td>
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</table>

### Inspected By

<p>| | |</p>
<table>
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<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Reason for Inspection

(Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

3. Principle and emergency spillway elevations.

---

**INTEGRATED**

**Rev. 10-2007**

**Div. of Oil, Gas & Mining**
Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanup, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

5. Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

Qualification Statement
I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: _______________________________ Date: ________________

CERTIFIED REPORT
IMPOUNDMENT EVALUATION (If NO, explain under Comments) YES NO
1. Is impoundment designed and constructed in accordance with the approved plan?

2. Is impoundment free of instability, structural weakness, or any other hazardous condition?

3. Has the impoundment met all applicable performance standards and effluent limitations from the previous date of inspection?

### COMMENTS AND OTHER INFORMATION

**Certification Statement:**

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself or under my direction and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability in accordance with the Utah R645 Coal Mining Rules.

[PE Cert. Stamp]

**By:**

(Full Name and Title)

**Signature:** ____________________________  **Date:** ____________________________

**P.E. Number & State:** ____________________________
APPENDIX 5-3

COAL MINE WASTE
FIRE EXTINGUISHING PLAN
Appendix 5-3
Coal Processing Waste
Fire Extinguishing Plan

General

The following is a general plan to be followed in the event of a fire on the coal processing waste area (refuse pile). Keep in mind that the refuse pile is actually incised by native earth and covered with 4' of suitable material. The refuse is actually filling a low area and is not above ground level, it is more like an inverted pile encompassed completely by native soil. No part of the refuse pile will protrude above ground level. Proper handling of the waste should prevent any combustion from occurring; however, in the event of a fire, the following plan will be followed:

Fire Fighting Plan

The mine supervisor will be notified immediately. The operations manager or chief engineer will also be notified.

The supervisor will examine the fire area and determine its severity. He will then confer with the operations manager or chief engineer to determine the extinguishing method to be employed. The permitting manager or chief engineer shall contact the regulatory authority and MSHA to discuss a plan for extinguishing the fire. In lieu of other suggestions or plans, the following method will be used.

1) In areas where the refuse has not yet been covered: The best way to extinguish a fire is to smother the fire by spreading and compacting borrow over the burning area to eliminate the air supply. If the fire is in an area that has not been covered the heat or fire will be covered by the previously stockpiled soil designated for use as 4' cover material. The material will be compacted in 12" lifts eliminating the air supply.

2) In areas where the refuse has been covered. It will be necessary to begin removal of the burning material. The removed material will be spread in thin layers onto a soil-stripped area for extinguishing. This area will be within that proposed for refuse disposal and pre-stripped as per the plan. Water will be employed only if the spreading material is not sufficient to prevent further burning. Once a fire is extinguished, the material will be returned to the low areas from which it was removed and the material removed from over the fire will be replaced with compaction of 12" lifts eliminating the air supply.
Only the mine supervisor and operators or others designated by him will be allowed to participate in fire extinguishing procedures. All authorized persons will be familiar with the above techniques prior to working around a fire, and adequate safety measures will be employed to ensure the safety measures will be employed to ensure the safety of the fire fighters and the public in general.

Burned Waste Utilization

It is currently not anticipated that any burned coal waste, other materials, or refuse is to be removed from any disposal area. However, should this become necessary, a plan for removal shall be certified by a qualified engineer and approval obtained from the regulatory authority.
APPENDIX 5-4

NEW FACILITY DESIGN

Information for Appendix 5-4 is mostly hard copies. Electronic copies do not exist for all information contained within the Appendix.
APPENDIX 5-4

ROADS

Existing Lila Canyon Road: (County Road 126)

The Lila Canyon road runs from the Horse Canyon Mine to the proposed Lila Canyon surface facilities then continues from the Lila Canyon surface to U.S. Highway 191/6. This road was constructed in the early 1940's to provide access to coal reserves south of the Horse Canyon Mine. The road extends south from Horse Canyon following the base of the Book Cliffs escarpment then turns south connecting to Highway 191/6. The road right-of-way consists of a total width of 100 feet. A small portion of this road is on BLM surface and a BLM right-of-way was issued to Kaiser Steel Corporation and is now owned by UEI. The portions of this road is on private property owned by UEI and William Marsing. Emery County also claims the road under the RS-2477 federal road designation. Any constructed facilities, including the 6 foot chain link fence, would not be placed on the county road right-of-way. County road 126 has been used for years by residents of Carbon and Emery Counties for recreation, ranching, and hunting purposes. Over the last 50 years, the majority portion of this road received little, if any maintenance. However, the first 2.5 miles from U.S. 191/6 to the correl has received frequent maintenance.

Main access to the mine site will be from U.S. Highway 191/6. The proposed access road will be constructed by Emery County and will be designated as Lila
Canyon Road 126. Some areas of the road will be upgraded others areas will be realigned. This road will be a two lane, 30 foot wide gravel surface Class B road, totaling approximately 4.7 miles in length. The proposed road reconstruction and realignment will be designed for a maximum speed of 45 miles per hour, would be constructed according to the standards of the American Department of Transportation 1992 Standard Specifications for Road and Bridge Construction. The realigned and reconstructed road will provide a safer and more direct route to the mine from U.S. Highway 191/6. The road will follow closely the existing RS-2477 road. Only the section of county road 126 from U.S. Highway 191/6 to Lila Canyon surface will be improved and or reconstructed. The county has no current plans to upgrade the section of 126 from Lila Canyon to Horse Canyon. All engineering, construction and maintenance on the reconstructed and realigned road will be implemented and controlled by the Emery County Road Department. Emery County will also control all necessary rights-of-way.

New Mine Facility Road:

The mine facility road shown on Plate 5-2 begins at the edge of County Road 126 and allows for access to the various surface facilities. The road has been located in the most practical location taking into consideration grade, stability, and alignment. Employees will use this road to access the office & bathhouse facilities. Coal haul trucks will use this road to access the scales and truck loadout. All supplies will be hauled on a short portion of this road from the supply storage area to the slope access road. The road will initially be graveled but will be paved in the
long term to minimize dust and provide good surface for heavy truck traffic as well as facility access. The facility access road will be approximately 24' wide to provide for two lane traffic and will have the appropriate drainage controls to insure long term life and low maintenance. The has been constructed and will be maintained according to the appropriate R645-534 and R645-527 regulations.

New Slope Access / Portal Access Road

The slope access road splits off the facility access road near the north-east corner of the equipment and supply storage area, and follows an alignment that takes into consideration grade and direct access. The slope access road will be used to provide access to the rock slopes which in-turn proved access to the underground workings. The slope access road will be used as access for all men, material and equipment need in the mine. Since the slope access road provides for frequent access for men, equipment and materials for a period of six months or longer the slope access road is classified as a primary road. The slope access road will be designed, constructed, and maintained according to appropriate R645 regulations. The slope access road is shown on Plate 5-2.

Coal Pile Road

The Coal Pile Road is shown on plate 5-2. The Coal Pile Road will be 15' wide and will follow the existing contours approximately 400' from the Portal Access Road to the ROM coal pile. The Coal Pile Road is an ancillary road due to its infrequently used by a front end loader or pickup truck.
Existing Little Park Road:

The Little Park road runs from the Horse Canyon Mine, up to the top of Little Park, and across Little Park to Turtle Canyon, then down Turtle Canyon to the Green River. This road has been used for years by residents of Carbon and Emery Counties for recreation, ranching, and hunting purposes. It is a public road and is maintained by either the BLM and or Emery County. The road is “Cherry Stemed” by the new BLM wilderness reinventories. The road is used by UEI to monitor water and will continue to be used on a frequent basis for subsidence monitoring and water monitoring. Plate 5-1 as well as others show the location of the Little Park road.

Existing Vehicle Ways:

Several vehicle ways off from the Little Park road are used by UEI for water monitoring. UEI will continue to use these vehicle ways frequently for water and subsidence monitoring. The vehicle ways vary from 5 to 15 feet wide. These ways are located either in dry stream channels, or are old drilling roads both accessed by ATV. No future maintenance is projected for these vehicle ways. Plate 5-1 as well as others show the location of the vehicle ways used by UEI.
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<td>0.00</td>
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* See Plates 5-2, 5-7A, and 5-7B.

** Includes 27,540 cu. yds. from rock slopes.
New Slope Access / Portal Access Road
Main Mine Road

DESIGN

See Appendix 5-4 and Plate 5-2 for additional information:
Page 1
Scale 1' = 40'

Horizontal Scale 20
Vertical Scale 20
Scale 1"=40'

Page 6
Appendix 5-4

Mine Facility Road

DESIGN

See Appendix 5-4 and Plate 5-2 for additional information:

INCORPORATED
MAY 05 2017

Div. of Oil, Gas & Mining
MINE FACILITY ROAD PLAN VIEW

- UNDISTURBED WITHIN THE DISTURBED AREA
- DISTURBED AREA BOUNDARY:
- INCIDENTAL ROCK DISTRIBUTION:
  - Disturbed Drainage
  - Ditch
  - Culvert
  - Cross Section

Scale = 1' = 100'

MAY 05 2017
DIV. OF OIL, GAS, MINING
Horizontal Scale 50
Vertical Scale 25
Horizontal Scale 50
Vertical Scale 25
LILA CANYON MINE
PROPOSED SEWAGE SYSTEM

INCORPORATED
MAY 05 2017
Lila Canyon Mine
Proposed Sewage System

Introduction

The Lila Canyon Mine facilities will be located in the Right Fork of Lila Canyon, which is in the Book Cliffs of Carbon County, approximately 10 miles south of Sunnyside, Utah. Due to the remote location, no sewage treatment facilities are available; therefore, it is proposed to treat wastewater with septic tank/drainfield systems.

Lila Canyon is an ephemeral drainage, flowing only in response to rainfall or snowmelt. There are no streams, springs or water wells located within 1500 feet of the proposed treatment facilities. Undisturbed drainage above the minesite is carried around the minesite in natural channels and beneath the sediment pond in a large culvert. Runoff from the mine site is directed to a sedimentation pond where it is held and treated as necessary to meet effluent standards according to the U.P.D.E.S. Discharge Permit.

The proposed drainfield will be in a soil type known as the Strych, which is a stony, fine, sandy loam. Complete soil descriptions are provided in Chapter 2 and on Plate 2-1. Test holes in the area to a depth of 10 feet show no evidence of bedrock or ground water.

General

Due to area restrictions and available depth for absorption, it is proposed to use seepage trenches for the drainfield. This allows the main trenches to be installed in native soil beneath the unpaved parking area.

Since the mining permit has not been approved at this time, and the proposed drainfield is in a cut area which would require disturbance, it is not possible to conduct actual percolation tests for the design. Based on recent discussions with the Southeastern Utah Health Department District Engineer, and evaluation of soil types in the area, an allowable volume of 1.0 gal/ft²/day is considered acceptable for design of the seepage trenches.

It should be noted that the seepage trenches will be constructed per Exhibit 1. Septic tanks, yard boxes and junction boxes will be standard from Dura-Crete, Inc.
Design

The septic system has been designed according to R317-5 regulations for Large Underground Wastewater Disposal Systems. Water quantities have been estimated at 35 gallons per day per person based on Table 5.2 (Industrial Buildings). The design for each of the separate facilities is based on the expected maximum number of people using the site. Based on 140 people, the system is designed for 4900 gallons per day.

Facilities Area
(Includes Office, Shop, Bathhouse and Warehouse)

Criteria

140 people
35 gallons/day/person
Allowable Q = 1 gal/ft²/day
Area = 4900 gpd/1.00 gal/ft²/day = 4900 ft²

Calculations

Q = 140 x 35 = 4900 gpd
Tank = V = 1125 + 0.75 Q = 4800 gallons
Seepage Trench = Allowable Q = 1.00 gal/ft²/day

Design

Septic Tank - 5000 gallon
Main Drainfield - 4 trenches x 100' long x 6' deep; 18' c-c; Trenches level and connected.
Sidewall Area = 4800 ft²
**Summary**

The following is a summary of the separate wastewater disposal system design proposed for this minesite:

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<thead>
<tr>
<th>Location</th>
<th>Main Facilities</th>
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<tbody>
<tr>
<td>Number of People</td>
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<tr>
<td>Septic Tank</td>
<td>4900</td>
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<td>(gal. Required)</td>
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<td>Septic Tank</td>
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<tr>
<td>(gal. Proposed)</td>
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<tr>
<td>Drainfield</td>
<td>4800</td>
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<tr>
<td>(ft² Required)</td>
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<td>(ft² Proposed)</td>
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<tr>
<td>Number of Trenches</td>
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<td>Trench Depth (ft.)</td>
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</table>
EXHIBIT 1
SEEPAGE TRENCH
TYPICAL SECTION

FINISHED SURFACE

GEOTEXTILE FABRIC BARRIER

BACK FILL

PERFORATED 4" PIPE

3/4" - 2" CLEAN GRAVEL

DRAIN ROCK

24" - 36"

36"

72"
Appendix 5-5

Lila Canyon Mine

Safety Factor Analyses for
Portal Access Road, Sediment Pond and Reclaimed Slope
Appendix 5-5
Safety Factor Analyses
for Portal Access Road, Sediment Pond and Reclaimed Slope

General

The soils information used in these calculations is taken from the data provided by Earthfax Engineering, Inc. for a slope stability analysis of a previously proposed access road. The access road location has been changed, reducing the height and angle of cut and fill slopes; however, the soils data is still representative of the new location. The data was compiled from 3 test pits located on the proposed mine site. (See Table 1) Parameters utilized in this report are based on the "worst-case" soils test for conservancy.

Safety factors in this report were determined by using Geo-Slope Slope/W Version 5 software. The "Spencer's Method" was used within Slope/W. Spencer’s method considers both normal and shear inter-slice forces, and satisfies both force and moment equilibrium. Spencer’s method is unique in that the ratio of shear to normal inter-slice forces is a constant, and is therefore the same for each slice. The safety factors are calculated using a given set of parameters, including slope height, slope angle, soil density, cohesion and internal friction angles.

The following assumptions are used in these calculations:

(1) The material forming the slope is assumed to be homogeneous;

(2) The sheer strength of the material is characterized by a cohesion (c) and a friction angle $\phi$;

(3) Failure is assumed to occur on a circular failure surface which passes through the toe of the slope;

(4) A vertical tension crack is assumed to occur in the upper surface of the face of the slope;

(5) The location of the tension crack and failure surface are such that the factor of safety of the slope is a minimum for the slope geometry and groundwater conditions considered.
Portal Access Road

This road is shown on Plate 5-2, and will provide access from the bathhouse area to the rock slope portals. The road is approximately 1600' in length, with a maximum grade of 12.5%. The road will be constructed using standard cut/fill techniques. Cut slopes are expected to be no steeper than 1H:1V with a maximum height of 23'. Fill slopes will not be steeper than 2H:1V with a maximum height of 50'.

Mine Facilities Access Road

The mine facility road shown on Plate 5-2 begins at the edge of County Road 164 and allows for access to the various surface facilities. The road has been located in the most practical location taking into consideration grade, stability, and alignment. Employees will use this road to access the office & bathhouse facilities. Coal haul trucks will use this road to access the scales and truck loadout. All supplies will be hauled on a short portion of this road from the supply storage area to the slope access road. The road will be constructed using standard cut/fill techniques. Cut slopes are expected to be no steeper than 1H:1V with a maximum height of 5'. Fill slopes will not be steeper than 2H:1V with a maximum height of 5'. The road is relatively flat. Safety factors were not calculated for this road since the most severe conditions are found on the Portal Access Road. Since the Portal Access Road meets or exceeds the minimum safety standard of 1.3 of the Utah Coal Rules, then it should be intuitive that the much flatter mine facility access road will exceed the minimum 1.3 stability standard.

Road Embankment Stability

The following parameters were used for input for the proposed road embankment:

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<th>Value</th>
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<tr>
<td>Slope Angle</td>
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<td>Soil Density</td>
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<td>Soil Cohesion</td>
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<td>Internal Friction Angle</td>
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</tr>
</tbody>
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The calculated Factor of Safety using the above parameters is 2.45 for dry conditions and 1.63 for saturated conditions. This exceeds the required 1.30 Factor of Safety required by the regulations.
Description: Worst Case Dry
Unit Weight: 116
Cohesion: 220
Phi: 41
Description: Worst Case Saturated
Unit Weight: 116
Cohesion: 300
Phi: 24

Description: Lila Canyon Extension to Horse Canyon MRP
Comments: Road Embankment Stability (Saturated) 2H:1V
File Name: Road Embank Wet.siz
Analysis Method: Spencer
Road Cut-Slope Stability

The following parameters were used for the proposed road cut slopes:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope Height</td>
<td>23'</td>
</tr>
<tr>
<td>Slope Angle</td>
<td>45° (1H:1V)</td>
</tr>
<tr>
<td>Soil Density</td>
<td>116 lbs/ft³</td>
</tr>
<tr>
<td>Soil Cohesion</td>
<td>220 psf dry / 300psf saturated</td>
</tr>
<tr>
<td>Internal Friction Angle</td>
<td>41° dry / 24° saturated</td>
</tr>
</tbody>
</table>

The calculated Factor of Safety for the cut slopes is 1.83 for dry conditions and 1.46 for saturated conditions. This also exceeds the 1.30 requirement of the regulations.

For non-circular failure the slip surface shape follow the arc of a circle through the soil until it intersects the bedrock layer. It then follows the bedrock surface until it again interests the slip circle. The soil strength used along the bedrock surface is the strength of the soil immediately above the bedrock. As can be seen on page 7-A, the safety factor for a worse case non-circular slip failure analysis is 1.51 for saturated conditions. This exceeds the 1.3 requirement of the regulations.
Description: Lila Canyon Extension to Horse Canyon MRF
Comments: Road Cut-Slope Stability (Dry) 1H:1V
File Name: Road CutSlope Dry.slz
Analysis Method: Spencer

Soil: 1
Description: Worst Case Dry
Soil Model: Mohr-Coulomb
Unit Weight: 116
Cohesion: 220
Phi: 41
Description: Lila Canyon Extension to Horse Canyon MRP
Comments: Road Cut-Slope Stability (Saturated) 1H:1V
File Name: Road CutSlope Wet.s Iz
Analysis Method: Spencer

Soil: 1
Description: Worst Case Saturated
Soil Model: Mohr-Coulomb
Unit Weight: 116
Cohesion: 300
Phi: 24
Description: Lila Canyon Extension to Horse Canyon MRP
Comments: Road Cut-Slope Stability (Saturated) 1H:1V Non-Circular Failure
File Name: Road CutSlope Wet2.siz
Analysis Method: Spencer

Soil: 1
Description: Upper Soil
Soil Model: Mohr-Coulomb
Unit Weight: 116
Cohesion: 300
Phi: 24
Sediment Pond Stability

The proposed sediment pond is shown on Plates 5-2, 7-2 and 7-6. The pond will be located in an existing drainage and will therefore be mostly incised into natural ground. The pond dam embankment will also be a reconstructed portion of the county road, with a top width of approximately 25'.

The proposed pond bottom will be a maximum of 13' below the top of the embankment. Slopes within the pond are proposed to be a maximum of 2H:1V for the incised portion and 3H:1V for the embankment. (See Sections C-C' and D-D')

Pond Cut-Slope Stability

The following parameters were used for the proposed pond incised slopes:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope Height</td>
<td>13'</td>
</tr>
<tr>
<td>Slope Angle</td>
<td>26.5° (2H:1V)</td>
</tr>
<tr>
<td>Soil Density</td>
<td>113 lbs/ft³</td>
</tr>
<tr>
<td>Soil Cohesion</td>
<td>220 psf dry / 300psf saturated</td>
</tr>
<tr>
<td>Internal Friction Angle</td>
<td>41° dry / 24° saturated</td>
</tr>
</tbody>
</table>

The calculated Factor of Safety for the pond cut slopes is 3.55 for dry conditions and 2.80 for saturated conditions. This exceeds the 1.30 requirements of the regulations.
Description: Lila Canyon Extension to Horse Canyon MRP
Comments: Pond Cut-Slope Stability (Dry) 2H:1V
File Name: Pond Cut_Slope dry.slz
Analysis Method: Spencer

Description: Worst Case (Dry)
Unit Weight: 116
Cohesion: 220
Phi: 41
Description: Lila Canyon Extension to Horse Canyon MRf
Comments: Pond Cut-Slope Stability (Saturated) 2H:1V
File Name: Pond Cut_Slope Saturated.siz
Analysis Method: Spencer

Description: Worst Case (Saturated)
Unit Weight: 116
Cohesion: 300
Phi: 24
Pond Embankment Stability

The following parameters were used for the proposed pond embankment:

- **Slope Height**: 13'
- **Slope Angle**: 18.4° (3H:1V)
- **Soil Density**: 113 lbs/ft³
- **Soil Cohesion**: 220 psf dry / 300 psf saturated
- **Internal Friction Angle**: 41° dry / 24° saturated

The calculated Factor of Safety for the pond embankment is **4.35** for dry conditions and **3.10** for saturated conditions. This also exceeds the regulatory requirement of **1.30**.
Description: Lila Canyon Extension to Horse Canyon MRP
Comments: Pond Embankment Stability (Dry) 3H:1V
File Name: Pond Embankment.siz
Analysis Method: Spencer

Soil: 1
Description: Soil 1
Unit Weight: 116
Cohesion: 220
Phi: 41
Description: Lila Canyon Extension to Horse Canyon MRP
Comments: Pond Embankment Stability (Saturated) 3H:1V
File Name: Pond Embankment wet.slz
Analysis Method: Spencer

Soil: 1
Description: Soil 1
Unit Weight: 116
Cohesion: 300
Phi: 24
Sudden Drawdown Protection

The sediment pond will be protected from failure from sudden drawdown by the following primary measures:

(1) Proper construction/compaction of the embankment as per engineering requirements in Appendix 7-4;

(2) Majority of pond is incised and therefore cut into natural ground with 2H:1V slopes for stability;

(3) Safety Factor calculations show the pond to be stable under both saturated and dry conditions; therefore, transition from one state to the other should not affect stability to the extent to cause failure;

(4) Pond embankment will be vegetated wherever feasible;

(5) It should also be noted that the pond design has been reviewed and approved by the State Engineers Office.

Using Geosystems Software SB-Slope Version 3.0 stability analysis for sudden drawdown conditions were run. Assuming a 10 foot sudden drop in water elevation, and a soil cohesion value one fourth of the measured value, the Factor of Safety would be 1.96. This reduced cohesion value was used for conservative purposes. The actual factor of safety would be considerably higher.
Description: Lila Canyon Extension to Horse Canyon MRP
Comments: Pond Embankment Stability (Sudden Draw Down) 3H:1V
File Name: Pond Sudden Draw Down.stz.slz
Analysis Method: Spencer
Reclaimed Slope

The proposed reclamation profile is shown on Plate 5-7C. A section of this profile, approximately 150' in length was selected for the stability calculation. This section is designated E-E' on Plate 5-7C and in Figure 3 of this Appendix. The section shows a maximum slope height of 40 feet at a slope angle of 14.9°. Density, cohesion and internal friction angles were assumed to be the same as indicated in Kwaku Boakye's thesis titled "LARGE IN SITU DIRECT SHEAR TESTS ON ROCK PILES AT THE QUESTA MINE, TAOS COUNTY, NEW MEXICO."

The calculated Factor of Safety for the reclaimed slope is 4.424 for saturated conditions. This exceeds the regulatory requirement of 1.30.

NOTE: All slopes will have a maximum steepness of 1H : 1V. All such slopes will have a safety factor of 1.3 or greater as shown above.
Description: Reclaimed Slope (Lila Canyon)
Comments: Rock Slope Material Slope Stability (Saturated)
File Name: Reclaimed Slope 4-1 Priscilla.siz
Analysis Method: Spencer

Description: Cover Material
Unit Weight: 116
Cohesion: 300
Phi: 24

Description: Rock Slope Material
Unit Weight: 152
Cohesion: 1.4
Phi: 48

---

Length (Feet)
0 24 46 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80 84 88 92 96 100 104 108 112 116 120 124 128 132 136 140 144 148 152 156 160 164 168 172 176 180 184 188 192 196

Height (Feet)
0 4 8 12 16 20 24 28 32 36 40 44 48

---

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Dw of Oil, Gas & Mining
INeEORATED

JAN 7 & 2010

Appendix 5.5

206 Utah American Energy, Inc.
Lila Canyon Mine
Summary

Factors of Safety have been calculated for the proposed portal access road, sediment pond and reclaimed slope, using the most conservative soil parameters taken from test pits on the proposed site.

Road cut safety factors range from 1.83 for dry conditions to 1.46 for saturated conditions. Road embankment factors of safety are 2.45 for dry and 1.63 for saturated conditions. These calculations show the proposed road design will exceed the 1.30 Factor of Safety required by the regulations.

The sediment pond incised (cut) slopes were shown to have a Factor of Safety of 3.34 for dry conditions and 2.80 for saturated conditions. Embankment stability shows a safety factor of 4.58 for dry conditions and 3.42 for saturated conditions. These calculated safety factors also exceed the regulatory requirement.

In addition to the Safety Factor calculations, discussion was also provided for methods of protecting the sediment pond from failure due to sudden or rapid draw down.

The reclaimed slope was shown to have a Factor of Safety of 4.24 for saturated conditions. These safety factors exceed the 1.30 regulatory requirements for reclaimed slopes.
Table 1

SUMMARY OF LABORATORY TEST RESULTS

<table>
<thead>
<tr>
<th>Test Pit</th>
<th>Standard Proctor Values</th>
<th>Direct Shear Test Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum Dry Density (pcf)</td>
<td>Optimum Moisture Content (%)</td>
</tr>
<tr>
<td>TP-1</td>
<td>113.0</td>
<td>14.5</td>
</tr>
<tr>
<td>TP-3</td>
<td>116.0</td>
<td>15.0</td>
</tr>
<tr>
<td>TP-4</td>
<td>113.5</td>
<td>13.5</td>
</tr>
</tbody>
</table>

(a) Samples compacted to 92% of the Standard Proctor dry density at the optimum moisture content and tested under consolidated-undrained (CU) unsaturated conditions with vertical effective pressures of 500, 1000, and 2000 psf.

(b) Samples compacted to 92% of the Standard Proctor dry density at the optimum moisture content and tested under consolidated-undrained (CU) saturated conditions with vertical effective pressures of 500, 1000, and 2000 psf.
July 2, 1998

Earthfax Engineering
7324 South 1300 East, Suite 100
Midvale, UT 84047

Attention: Rhett Brooks
Subject: Soils Laboratory Testing
Basic Management Services, Lila Canyon
AGEC Project No. 973301

Gentlemen:

Applied Geotechnical Engineering Consultants, Inc. was requested to provide laboratory testing on three samples received May 22, 1998. We understand that the samples came from the Basic Management Services site in Lila Canyon. The following tests have been performed in general accordance with the test method listed.

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Shear</td>
<td>ASTM D-3080</td>
</tr>
<tr>
<td>Standard Proctor</td>
<td>ASTM D-698</td>
</tr>
</tbody>
</table>

The results of the laboratory testing are shown graphically in Figures 1-9. The direct shear test specimens were remolded to approximately 92% of the standard proctor maximum dry density near optimum moisture content. Only material passing the #4 sieve was used in direct shear testing.

If you have any questions, or if we can be of further service, please call.

Sincerely,

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

Stephanie Francom
Rev. SDA, E.I.T.
Sample from: TP-1
Description: Basic Management Services
Lila Canyon

Test Method: ASTM D-698 Method A
Maximum Dry Density: 113.0pcf
Optimum Moisture Content: 14.5%

Atterberg Limits
Liquid Limit: %
Plasticity Index: %

Gradation
Gravel: %
Sand: %
Silt & Clay: %

Zero Air Voids Curve for:

G = 2.8
G = 2.7
G = 2.6

Project No. 973301 COMPACTION TEST RESULTS Figure 1
Sample from: TP-3
Description: Basic Management Services Lila Canyon

Test Method: ASTM D-698 Method C
Maximum Dry Density: 116.0 pc
Optimum Moisture Content: 15.0 %

Atterberg Limits
Liquid Limit: %
Plasticity Index: %

Gradation
Gravel: %
Sand: %
Silt & Clay: %

Zero Air Voids Curve for:
- G = 2.8
- G = 2.7
- G = 2.6

Moisture Content—Percent of Dry Weight

Project No. 973301  COMPACTION TEST RESULTS  Figure 2

INcorporated
May 18, 2007
Div. of Oil, Gas & Mining
Sample from: TP-4
Description: Basic Management Services
Lila Canyon

Test Method: ASTM D-698 Method C

<table>
<thead>
<tr>
<th></th>
<th>Maximum Dry Density</th>
<th>Optimum Moisture Content</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>113.5 pcf</td>
<td>13.5 %</td>
</tr>
</tbody>
</table>

Atterberg Limits
Liquid Limit
Plasticity Index

Gradation
Gravel
Sand
Silt & Clay

Zero Air Voids Curve for:
G = 2.8
G = 2.7
G = 2.6

Project No. 973301  COMPACTION TEST RESULTS  Figure 3
Applied Geotechnical Engineering Consultants, Inc.

\[ c = 490 \text{ psf} \quad \phi = 25 \text{ deg} \]

**DIRECT SHEAR TEST RESULTS**

<table>
<thead>
<tr>
<th>Test No. (Symbol)</th>
<th>1(1)</th>
<th>2(1)</th>
<th>3(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Type</td>
<td>Remolded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length, in.</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Diameter, in.</td>
<td>1.93</td>
<td>1.93</td>
<td>1.93</td>
</tr>
<tr>
<td>Dry Density, pcf</td>
<td>113</td>
<td>113</td>
<td>113</td>
</tr>
<tr>
<td>Moisture Content, %</td>
<td>14.5</td>
<td>14.5</td>
<td>14.5</td>
</tr>
<tr>
<td>Consolidation Load, ksf</td>
<td>0.5</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Normal Load, ksf</td>
<td>0.5</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Shear Stress, ksf</td>
<td>0.63</td>
<td>1.10</td>
<td>1.38</td>
</tr>
</tbody>
</table>

**Remarks**
- Strain Rate 0.05 in/min.
- Sample remolded to 92% of the standard proctor value near the optimum moisture content.

**Sample Index Properties**

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Density, pcf</td>
<td>N/A</td>
</tr>
<tr>
<td>Moisture Content, %</td>
<td>N/A</td>
</tr>
<tr>
<td>Liquid Limit, %</td>
<td>N/A</td>
</tr>
<tr>
<td>Plasticity Index, %</td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Gravel</td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Sand</td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Passing No. 200 Sieve</td>
<td>N/A</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Test No. (Symbol)</th>
<th>1(D)</th>
<th>2(□)</th>
<th>3(○)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Type</td>
<td>Remolded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length, in.</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>Diameter, in.</td>
<td>1.93</td>
<td>1.93</td>
<td>1.93</td>
</tr>
<tr>
<td>Dry Density, pcf</td>
<td>104</td>
<td>104</td>
<td>104</td>
</tr>
<tr>
<td>Moisture Content, %</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Consolidation Load, ksf</td>
<td>0.5</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Normal Load, ksf</td>
<td>0.5</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Shear Stress, ksf</td>
<td>0.80</td>
<td>1.41</td>
<td>2.01</td>
</tr>
<tr>
<td>Remarks</td>
<td>Strain Rate 0.05 in/min. Sample remolded to 92% of standard proctor value near the optimum moisture content.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sample Index Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Density, pcf</td>
<td>N/A</td>
</tr>
<tr>
<td>Moisture Content, %</td>
<td>N/A</td>
</tr>
<tr>
<td>Liquid Limit, %</td>
<td>N/A</td>
</tr>
<tr>
<td>Plasticity Index, %</td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Gravel</td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Sand</td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Passing No. 200 Sieve</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Type of Test**

Consolidated Undrained/Unsaturated

**Sample Description**

From TP-1

**Project No.** 973301

**DIRECT SHEAR TEST RESULTS**

**Figure 5**
Test No. (Symbol) | 1(●) | 2(●) | 3(○)
--- | --- | --- | ---
Sample Type | Remolded | | |
Length, in. | 0.75 | 0.75 | 0.75
Diameter, in. | 1.93 | 1.93 | 1.93
Dry Density, pcf | 107 | 107 | 107
Moisture Content, % | 15 | 15 | 15
Consolidation Load, ksf | 0.5 | 1.0 | 2.0
Normal Load, ksf | 0.5 | 1.0 | 2.0
Shear Stress, ksf | 0.50 | 0.77 | 1.17
Remarks | Strain Rate 0.05 in/min. | | 
Sample was remolded to 92% of the standard proctor value near optimum moisture content.

Sample Index Properties
<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Density, pcf</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Moisture Content, %</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Liquid Limit, %</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Plasticity Index, %</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Gravel</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Sand</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Passing No. 200 Sieve</td>
<td></td>
<td>N/A</td>
</tr>
</tbody>
</table>

Type of Test
Consolidated Undrained/Saturated
Sample Description
From TP-3
Project No. 873301

DIRECT SHEAR TEST RESULTS

From TP-3
Applied Geotechnical Engineering Consultants, Inc.

\[ c = 220 \text{ psf} \quad \phi = 41 \text{ deg} \]

### DIRECT SHEAR TEST RESULTS

#### Test No. (Symbol)
<table>
<thead>
<tr>
<th>Test No.</th>
<th>1(Ø)</th>
<th>2(●)</th>
<th>3(Δ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Type</td>
<td>Remolded</td>
<td>Remolded</td>
<td>Remolded</td>
</tr>
<tr>
<td>Length, in.</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>Diameter, in.</td>
<td>1.93</td>
<td>1.93</td>
<td>1.93</td>
</tr>
<tr>
<td>Dry Density, pcf</td>
<td>107</td>
<td>107</td>
<td>107</td>
</tr>
<tr>
<td>Moisture Content, %</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Consolidation Load, ksf</td>
<td>0.5</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Normal Load, ksf</td>
<td>0.5</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Shear Stress, ksf</td>
<td>0.68</td>
<td>1.06</td>
<td>1.99</td>
</tr>
</tbody>
</table>

**Remarks**
- Strain Rate 0.05 in/min.
- Sample remolded to 92% of the standard proctor value near optimum moisture content.

#### Sample Index Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Density, pcf</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Moisture Content, %</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Liquid Limit, %</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Plasticity Index, %</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Gravel</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Sand</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Passing No. 200 Sieve</td>
<td></td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Type of Test**
- Consolidated Undrained/Unsaturated

**Sample Description**
- From TP-3

**Project No.** 973301

**Figure** 7
Applied Geotechnical Engineering Consultants, Inc.

\[ c = 300 \text{ psf} \quad \phi = 41 \text{ deg} \]

![Graph of shear stress vs. normal stress](image)

<table>
<thead>
<tr>
<th>Test No. (Symbol)</th>
<th>1(□)</th>
<th>2(△)</th>
<th>3(○)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Type</td>
<td>Remolded</td>
<td>Remolded</td>
<td>Remolded</td>
</tr>
<tr>
<td>Length, in.</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>Diameter, in.</td>
<td>1.93</td>
<td>1.93</td>
<td>1.93</td>
</tr>
<tr>
<td>Dry Density,pcf</td>
<td>104</td>
<td>104</td>
<td>104</td>
</tr>
<tr>
<td>Moisture Content, %</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Consolidation Load, ksf</td>
<td>0.5</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Normal Load, ksf</td>
<td>0.5</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Shear Stress, ksf</td>
<td>0.71</td>
<td>1.22</td>
<td>2.04</td>
</tr>
<tr>
<td>Remarks</td>
<td>Strain Rate 0.05 in/min.</td>
<td>Sample remolded to 92% of the standard proctor value near optimum moisture content.</td>
<td></td>
</tr>
</tbody>
</table>

**Sample Index Properties**

| Dry Density,pcf | N/A |
| Moisture Content, % | N/A |
| Liquid Limit, % | N/A |
| Plasticity Index,% | N/A |
| Percent Gravel | N/A |
| Percent Sand | N/A |
| Percent Passing No. 200 Sieve | N/A |

**Type of Test**

Consolidated Undrained/Saturated

**Sample Description**

**Project No.** 973301

**Figure** 8

**DIRECT SHEAR TEST RESULTS**
### DIRECT SHEAR TEST RESULTS

**Test No. (Symbol)** | 1(2) | 2(0) | 3(0)
---|---|---|---
**Sample Type** | Remolded | | |
**Length, in.** | 0.75 | 0.75 | 0.75
**Diameter, in.** | 1.93 | 1.93 | 1.93
**Dry Density, pcf** | 104 | 104 | 104
**Moisture Content, %** | 14 | 14 | 14
**Consolidation Load, ksf** | 0.5 | 1.0 | 2.0
**Normal Load, ksf** | 0.5 | 1.0 | 2.0
**Shear Stress, ksf** | 0.99 | 1.27 | 2.36
**Remarks** | Strain Rate 0.05 in/min. | | |
| | Sample remolded to 92% of the standard proctor value near optimum moisture content. | | |

**Sample Index Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Density, pcf</td>
<td>N/A</td>
</tr>
<tr>
<td>Moisture Content, %</td>
<td>N/A</td>
</tr>
<tr>
<td>Liquid Limit, %</td>
<td>N/A</td>
</tr>
<tr>
<td>Plasticity Index, %</td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Gravel</td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Sand</td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Passing No. 200 Sieve</td>
<td>N/A</td>
</tr>
</tbody>
</table>

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**Type of Test**

Consolidated Undrained/Unsaturated

**Sample Description**

From TP-4

**Project No.** 973301

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**Figure 9**

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**Applied Geotechnical Engineering Consultants, Inc.**

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APPENDIX 5-6

CLOSURES
FOR
MINE OPENINGS

Information for Appendix 5-6 is all hard copies. Electronic copies do not exist for all information contained within the Appendix.
All fill material is to be non-toxic and non-combustable
APPENDIX 5-7

LILA CANYON MINE

ROCK SLOPE MATERIAL
(Mine Development Waste)
General

The proposed Lila Canyon Mine includes a site and plan for permanent disposal of the rock slope material which by definition is considered “Underground Development Waste”. The underground development waste (rock slope material), will be generated by the construction of the rock slopes. The rock slope material differs from typical underground development waste in that the rock slope material does not contain any coal and consists of siltstone, mudstone, and sandstone. Coal and carbonaceous shale are not found in the rock slope material. Under no circumstances will the material removed from the rock slopes contain enough combustibles to induce or continue combustion.

The rock slope work will generate approximately 25,000 bank cubic yards of underground development waste (rock slope material). Using a 1.5 bulking or swell factor, the total amount of loose yard of rock slope material disposed of in the refuse area is approximately 37,500 yd³ (based upon an as-built survey of the rock slopes).

The rock slope material is used to construct the Upper Pad of the mine surface facilities (see Plate 5-2). The remaining pads (Middle Pad, Lower Pad, Temporary Storage Pad, Shop Pad, and New Storage Pad) are constructed using native subsoil.

Plate 5-2 shows the location of the ROM (run of mine) coal stockpile and the location where the rock slope material will be buried. Plate 5-7a shows a longitudinal profile of the reclaimed site. Plates 5-7b-1 to 5-7b-6 show cross sections along the profile shown in Plate 5-7a. The material shown on Plate 5-2 at the Upper Pad (ROM coal stockpile) contains the mine waste pile (sub-contract coal) that is regularly blended back into the ROM coal stream and conveyed to the crushed coal stockpile (Middle Pad) to be sold and shipped according to sales contracts.

The following sections will describe the ground preparation, placement, and reclamation procedures for the rock slope material. All the rock slope material will be placed in an incised area.

Ground Preparation

Vegetation and topsoil will be removed from the proposed rock slope storage area and stored in the topsoil pile as shown on plate 5-2.
Placement of Underground Development Waste (rock Slope Material)

Rock slope material will be dumped and compacted on the material supply pad. The material will be placed on the pad compacted in 24” lifts using a front end loader. Once all the rock slope material is placed and compacted.

The dumping (placing) of material on the pad is NOT the same as “end dumping”. End Dumping is defined by the Bureau of Mines as “Process in which earth is pushed over the edge of a deep fill and allowed to roll down the slope”.

Testing of the Rock Slope Material

Material from the rock slope portals will be tested five times that will take place as follows: during the initial startup, at the ¾ mark, the ½ mark, the ¼ mark and near completion of the rock slopes. Analysis of the four samples tested are included at the end of Appendix 6-2 with other acid and toxic analyses.

Testing parameters for the rock slope material will be as per Table 1.

Spreading and compaction

Compaction will take place using a wheeled loader during the filling operation. Upon final reclamation the topsoil will be redistributed over the rock slope storage area and reclaimed as per Chapter 3. The total cover over the rock slope material area, when considering the subsoil and topsoil, will be a minimum of 4’ if the material is found to be acidic or toxic forming.

Pad Configuration and Drainage

Runoff from the rock slope material storage area will be directed into the Sediment Pond shown on Plate 7-5.

Site Inspection

The rock slope material storage area will be inspected under the supervision of a qualified registered professional engineer on a quarterly basis during construction.

If such inspection discloses a potential hazard, the inspector will immediately notify the regulatory authority of the hazard and the emergency procedures to be implemented.
Reclamation

Upon completion of the active mining operation, the rock slope material disposal area will be covered with topsoil and seeded according to the approved plan. Runoff from the reclaimed disposal area will continue to flow to the sediment pond until Phase II Bond Release requirements for the reclaimed site are met.

TABLE 1

Rock Slope Material

List of Test Parameters for Acid & Toxic Material
(As per personal conversation with Priscilla 12/29/04)

<table>
<thead>
<tr>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph</td>
</tr>
<tr>
<td>EC</td>
</tr>
<tr>
<td>SAR</td>
</tr>
<tr>
<td>Available Boron</td>
</tr>
<tr>
<td>Soluble Selenium</td>
</tr>
<tr>
<td>Acid Base Potential</td>
</tr>
<tr>
<td>Texture</td>
</tr>
<tr>
<td>Water Holding Capacity</td>
</tr>
<tr>
<td>Total Nitrogen</td>
</tr>
<tr>
<td>Nitrate as Nitrogen</td>
</tr>
<tr>
<td>% Organic Carbon</td>
</tr>
</tbody>
</table>
APPENDIX 5-8

RECLAMATION AND ENHANCEMENT PLAN

Some of the Information for Appendix 5-8 is hard copies. Electronic copies do not exist for all information contained within the Appendix.
Reclamation and Enhancement Plan Associated with the Lila Canyon Mine Site

I. Description of Existing Area

The Lila Canyon Mine constitutes approximately 40.12 acres within the disturbed area boundary. For the purpose of reclamation, the total area is divided into two units. The upper unit consists of the water treatment area and the portal pad. The lower unit consists of the majority of the facilities, bath house, parking, shop, and coal handling structures (see plate 5-2 Surface Facilities). In addition to the above, there is a spoil/refuse disposal area and sediment pond. The actual disturbance, pads, silos, coal processing structures, parking constitute a total of 33.99 acres. The pond is the only structure that will remain throughout phase 2 bond liability.

This new disturbance constitutes a loss of approximately 40 acres of critical high value big game winter range. In addition, it distracts from the general aesthetics of the upper reaches of Lila Canyon.

The following reclamation plan is designed to rehabilitate this area to such a degree that the appearance would be aesthetically compatible with the adjacent undisturbed area and reestablish a desirable and diverse vegetative cover that will enhance wildlife habitat and domestic grazing.

II. Demolition and Clean-Up

After abandonment the area will be cleared of all mine related material and structures. The majority of the coal handling equipment; belt lines, conveyors, and some of the metal fab buildings, will be sold as used equipment and removed prior to demolition. The balance of the structures will be demolished utilizing heavy equipment such as; dozers, loaders track hoes, various shears for steal dismantling etc. The trash (non-metal, non-concrete material) will be removed from the site and hauled to an approved land fill. Any contaminated soil or debris, such as coal refuse that has petroleum additives, would be hauled to an approved disposal site. The balance of the non-combustible, non-ferrous debris such as concrete would be buried on site.

All material with salvage value would be removed by a licensed salvage company.

May 14, 2019
III. Reclamation Plan

Following the cessation of mining, the portal cuts can be brought back to approximate original contours.

Earthwork

Topsoil amounts can be found in Section 232.100 and is calculated from Plate 2-3
Concrete amounts can be found in Section 520.
Coal Mine Waste amounts can be found Page 2 in Appendix 5-7.
General back fill can be found in Table 1 of Appendix 5-4.

Pad and Facility Site

This area would be re-contoured utilizing equipment such as dozers, scrapers, backhoes, track hoes, trucks, etc. The level nature of the topography would allow the equipment to work in unison.

To create a natural slope similar to the pre-mining topography (see Plate 7-7 Post Mining Hydrology), the natural channels would be reconstructed and rip rap to minimize the potential for erosion as detailed in Chapter 7, Appendix 7-4. Fill will be placed in a manner as to prevent water channelization.

Sediment Pond

Plate 7-7 shows the surface configuration for the area at the Phase I bond release. At Phase I bond release, the area will be backfilled and graded to the final configuration except for the sediment pond. The sediment pond will be removed after the Operator demonstrates that vegetation adequately controls erosion.

Erosion

Following the ripping the stored topsoil (growth media) would be spread to a uniform depth over the entire lower area.

It is imperative that as the area is re-contoured that the surface is pock-marked (see Figure 1). Pock-marking creates a very uneven surface which to a large degree diminishes the likelihood of erosion (gullies and rills) and enhances the success of revegetation.

In conjunction with the pock-marking, the track hoe can cast any vegetation: dead trees, large rocks, back onto the re-contoured surface. The pockmarking creates a more mesic site by trapping precipitation, both rain and snow, in the depressions.
The debris (dead trees, rocks etc.) on the surface accomplish the same function to a lesser degree by providing solar protection. In addition, the combination of the above makes the site more aesthetically compatible with the adjacent undisturbed areas and to a large degree discourages both domestic stock as well as the big game from adversely impacting the site until the vegetation can become established.

**Revegetation**

In conjunction with the earth moving, the site will be hydro-seeded, mulched, tackified and fertilized. The following methodologies have been incorporated on numerous sites on both private and federal lands, and have proven very successful frequently allowing Phase 2 Bond release in as little as three growing seasons.

**A. Methodology-Seeding and Mulching**

A hydro-seeder is positioned directly behind the track hoe as the hoe re-contours and implements the site seed bed preparation, the hydro-seeder can spray over the hoe or utilized a hose line to apply the seed in combination with 500#/acre wood fiber-mulch and 100#/acre of tack agent. Following the seeding, the entire area is then overs-prayed with 1500 to 2000 pounds of wood fiber mulch per acre.

An additional 100#/acre of tack and fertilizer, choice and application rate to be determined by the testing in section 243, would be added to this mulch slurry. Fertilizer and seed will not be mixed during hydrosowing operations. The lower area would be hydro-seeded and mulched utilizing the same procedures, with the exception that the operation can occur as each area is ready and would not interfere with adjacent earthmoving activities.

Depending on weather conditions, the hydro-mulched areas should be allowed to harden off (dry on the surface) from 24 to 72 hours before the area is walked on.

**B. Methodology- Seedling Planting**

Woody plants (shrubs) are a component in the final reclamation seed mix. Two years following reclamation, an ocular estimate of the reclaimed site will be conducted. If it appears that the woody plant density is lacking, containerized or bare rooted stock may be planted to supplement stocking. The species and numbers will be determined from the evaluation of the ocular estimates and with consultation with the Division and DWR. The operator will follow R645-301-357.311.
The planting procedures, as outlined, must be strictly adhered to in order to insure a reasonable degree of success. The following is a list of key points:

1. Live Seedlings – ideally dormant planting stock
2. Stock – primarily root mass kept moist at all times
3. Position of seedlings to maximize survival potential
4. Proper Planting Procedure (Figure 4)
   - A. Straight and natural root alignment (no "J" roots)
   - B. Firm soil placement length of root mass (no air pockets)
   - C. The root collar needs to be ½ to 1" below grade (soil depth)

The actual planting of seedlings can follow the seeding mulching anywhere from 24 hours up to two years with little or no adverse results. Ideally, planting should occur as late as possible in the fall prior to the first snow, or as early in the spring as the site is accessible. Fall planting normally produces better results and is not as vulnerable to weather conditions. In both cases, survival will increase if the planting stock is dormant when planted.

The root mass should be kept moist at all times during transport, handling and planting. This is somewhat easier with containerized stock, but can be accomplished with bare root stock if a few simple procedures are followed.

A good procedure is to insure moist roots on bare root stock is to mix a slurry of vermiculite and/or potting soil in a 30 gallon water filled barrel. Cut up pieces of burlap approximately 18x24 inches and soak overnight in the slurry. Wrap the root mass of the bare root stock loosely in a roll of saturated burlap prior to planting. Each roll should contain 50 to 100 seedlings loosely rolled within the burlap and placed in a planting bucket or bag or field use. Periodically during the day, the rolls can be wet down in the event they start to dry.

It is imperative to have the holes dug and ready to plant, prior to removing the seedlings from the container or burlap roll. In warm or windy conditions, a seedling’s root hairs can dry out in as little as seven seconds, effectively killing the plant.
When selecting the location for the seedling, always keep in mind to maximize the potential for moisture and shade, select “depressions” over “humps” and areas adjacent to rocks, dead trees, etc. to provide solar protection. In pock marks, the seedling should be placed approximately one third the way up from the bottom. This area allows the roots to extend into the moist soil and avoids having the seedling covered by sluffing or siltation (See Figure 2).

The last area of concern is to utilize correct planting procedures. There are a variety of planting tools on the market. They range from a 16 inch tile spade to a region 6 “hoedad”. Any tool capable of digging a hole at least 2 inches deeper than that of the root mass is adequate.

It is imperative that the root mass is placed in the hole in a straight near natural configuration. The soil should be firmly pressed around the roots utilizing your hand, not a foot or stick. The planter must make sure there are no air pockets left in the hole, and insure the seedling is planted to the correct depth.

This is accomplished by showing each planter the location of the root crown. It is advantageous for the root crown to be covered by ½ to 1 inch of soil at time of planting. This allows the soil to settle without exposing the root crown (See Figure 3).

Following the planting, all trash (containers, etc.) will be removed from the site. A four-strand barbed wire fence will be constructed around the lower area to preclude domestic stock from entering the site.

A sign reading “This Area is Temporarily Closed for Reclamation” shall be posted on the fence and maintained until the site is re-vegetated. After the vegetation is well established (Phase 2 Bond Release), the sediment pond can be removed by simply re-contouring back over the pond area.

The same seeding and planting methodologies will be utilized to revegetate this small area.
Figure 1
Pock Mark Configuration

Cross Section

Plan

Offset

4 ft

5 ft

36 in.

24 in.
Figure 2
Seedling Locations

Seedling

8 inch Soil Depth

Rock

12 in.

Ideally: Southeast Side
Figure 3
Seedling Planting Procedure

Seedling

Soil: 1/2 to 1 inch above Root Collar
Root Collar

No Air Pockets in Area of Root Mass

Firmly Packed Soil

Straight Root Mass Not "J" Shaped

Incorporated
May 18, 2007
Div. of Oil, Gas & Mining