

CHAPTER 5

Engineering

R645-301-500

TABLE OF CONTENTS

Chapter 5

R645-301-500

Engineering

510.	INTRODUCTION	5-1
511	General Requirements	5-1
511.100–300.	Contents	5-1
512	CERTIFICATION	5-1
512.100.	Cross Sections and Drawings	5-1
512.200.	Plans and Engineering Designs	5-1
512.210 –230.	Excess Spoil Disposal Areas, Durable Rock Fills and Coal Mine Waste	5-1
512.240.	Impoundments	5-2
512.250.	Primary Roads	5-2
512.260.	Variance From Approximate Original Contour	5-2
513.	COMPLIANCE WITH MSHA REGULATIONS AND MSHA APPROVALS	5-3
513.100.	Coal Processing Waste Dams and Embankments	5-3
513.200.	Impoundments and Sedimentation Ponds	5-3
513.300.	Disposal of Underground Development Waste, Coal Processing Waste and Excess Spoil in Underground Mine Workings	5-3
513.400.	Refuse Piles	5-2
513.500.	Capping, Sealing and Backfilling Openings to the Surface from the Underground	5-3
513.600.	Discharges into an Underground Mine	5-5
513.800.	Coal Mine Waste Fires	5-5
514.	INSPECTIONS	5-5
514.100-140.	Excess Spoil	5-5
514.200-250.	Refuse Piles	5-5
514.300.	Impoundments	5-6
514.310-313.	Certified Inspection	5-6
514.320.	Inspection Standard and Frequency	5-6
515	REPORTING AND EMERGENCY PROCEDURES	5-6
515.100.	Slides	5-6
515.200.	Impoundment Hazards	5-6
515.300-320.	Temporary Cessation	5-7

516	PREVENTION OF SLIDES	5-7
520	OPERATION PLAN	5-7
521	GENERAL	5-7
521.100.	Cross-Sections and Drawings	5-8
521.110.	Previously Mined Areas	5-8
521.120.	Existing Surface and Subsurface Facilities and Features	5-8
521.121.	Buildings	5-8
521.122.	Surface and Subsurface Man-Made Features	5-8
521.123.	Public Roads	5-8
521.124.	Existing areas of spoil, waste, coal development waste, and non-coal waste disposals, dams, embankments, other impoundments, and water treatment and air pollution control facilities	5-8
521.125.	Ponds and Other Impoundments	5-8
521.130.	Landowners and Right of Entry and Public Interest Drawings	5-8
521.132	Permit Boundary	5-9
521.133	Public Roads	5-9
521.133.2	Relocating a Public Road	5-9
521.140.	Mine Drawings and Permit Area Drawings	5-9
521.141.143.		
521.150.	Land Surface Configuration Drawings	5-13
521.160.	Drawings and Cross Sections of the Proposed Features for the Proposed Permit Area	5-14
521.170.	Transportation Facilities Drawings	5-15
521.180.	Support Facilities	5-16
521.200.	Signs and Markers Specifications	5-18
521.240.	Mine and Permit Identification Signs	5-18
521.250.	Perimeter Markers	5-18
521.260.	Buffer Zone Markers	5-18
521.270.	Topsoil Markers	5-18
522	COAL RECOVERY	5-18
523	MINING METHODS	5-20
524	BLASTING AND EXPLOSIVES	5-22
524.100	Blaster Certification	5-23
524.300-350	Preblasting Survey	5-23
524.400.	Blasting Schedule	5-24
524.420.	Timing of Blasting	5-24
524.410.	Unscheduled Blasts	5-24
524.450-453.	Blasting Schedule Publication and Distribution	5-24
524.460-465.	Blasting Schedule Contents	5-25
524.500-532.	Blasting and Warning Signs, Access Control	5-25
524.600-610.	Adverse Effects of Blasting	5-25

524.620.	Airblast Limits	5-26
524.630.	Monitoring	5-26
524.633.	Flyrock	5-26
524.640-622.	Ground Vibration	5-26
524.690.	Standards not Applicable	5-27
524.700.	Records of Blasting Operations	5-28
524.800.	Use of Explosives	5-28
525.	SUBSIDENCE CONTROL PLAN	5-28
526.	MINING FACILITIES	5-28
526.110-115.	Existing Structures	5-28
526.116.	Public Roads	5-28
526.116.1.	Operations Within 100 ft. of a Public Road	5-28
526.116.2.	Relocating a Public Road	5-29
526.200.	Utility Installation and Support Facilities	5-29
526.210.	Existing Utilities	5-29
526.220	Support Facilities	5-29
526.300	Water Pollution Control Facilities	5-31
526.400	Air Pollution Control Facilities	5-31
527.	TRANSPORTATION FACILITIES	5-32
527.100.	Classification of Roads	5-32
527.200.	Description of Roads	5-32
527.220.	Alteration or Relocation of Natural Drainage ways	5-33
527.230.	Road Maintenance	5-34
527.250.	Geotechnical Analysis	5-34
528.	HANDLING AND DISPOSAL OF COAL, OVERBURDEN, EXCESS SPOIL, AND COAL MINE WASTE	5-34
528.100.	Coal Removal, Handling, Storage, Cleaning, and Transportation Areas and Structures	5-34
528.200.	Overburden	5-35
528.300.	Spoil, Coal Processing Waste, Mine Development Waste, and Non-coal Waste Removal, Handling, Storage, Transportation, and Disposal Areas and Structures	5-37
528.310.	Excess Spoil	5-37
528.320.	Coal Mine Waste	5-41
528.322.	Refuse Piles	5-41
528.323.	Burning and Burned Waste Utilization	5-41
528.330.	Non-coal Mine Waste	5-41
528.340.	Underground Development Waste	5-42
528.350.	Acid-Forming and Toxic Materials	5-42
528.400.	Dams, Embankments and other Impoundments	5-42

529.	MANAGEMENT OF MINE OPENINGS	5-42
530.	OPERATIONAL DESIGN CRITERIA AND PLANS	5-44
531.	GENERAL	5-44
532.	SEDIMENT CONTROL	5-44
532.100	Disturbed Area	5-45
532.200	Backfill Stabilization	5-45
533-100-714.	IMPOUNDMENTS	5-45
534	ROADS	5-47
534.100-200.	Roads will be located, designed, constructed, reconstructed, used maintained, and reclaimed so as to:	5-47
534.300-340.	Primary Roads	5-49
535.	SPOIL	5-49
535.100.	Disposal of Excess Spoil	5-49
535.200.	Disposal of Excess Spoil: Valley Fills/Head-of-Hollow Fills	5-52
535.300.	Disposal of Excess Spoil: Durable Rock Fills	5-52
535.400.	Disposal of Excess Spoil: Preexisting Benches	5-52
535.500.	Faceup Operations for Underground Coal Mine Development	5-52
536.	COAL MINE WASTE	5-52
537.	REGRADED SLOPES	5-52
540.	RECLAMATION PLAN	5-53
541.100-400.	General	5-53
542.	NARRATIVE, DRAWINGS AND PLANS	5-54
542.100–600.	Plan and Timetable	5-54
542.700.	Final Abandonment of Mine Openings	5-56
542.720.	Disposal of Excess Spoil	5-58
542.730.	Disposal of Coal Mine Waste	5-58
542.740.	Disposal of Non-coal Mine Wastes	5-58
542.800	Reclamation Cost	5-58
550.	RECLAMATION DESIGN CRITERIA AND PLANS	5-59
551	SEALING AND CASING OF UNDERGROUND OPENINGS	5-59
552	PERMANENT FEATURES	5-60

553	BACKFILLING AND GRADING	5-60
553.200	Spoil and Waste	5-64
553.300	Covering of Exposed Coal Seams, and Acid and Toxic-Forming	5-64
553.400	Cut and Fill Terraces	5-64
553.500	Previously Mined Areas and Continuously Mined Areas	5-64
553.600	Highwall Management	5-64
553.700	Backfilling and Grading: Thin Overburden	5-65
553.800	Backfilling and Grading: Thick Overburden	5-65
560.800	Performance Standards	5-69

APPENDICES

5-1	Geotechnical Analysis - Sediment Impoundments and Excess Spoil Structure
5-2	Sediment Impoundment and Diversion Structure Analysis
5-3	Robinson Creek Culvert and Diversion Analysis

DRAWINGS

General

5-1	Pre-mining Topography
5-2	Disturbance Sequence

Facilities (5-3 to 5-8)

5-3	Facilities and Structures Layout
5-4	Loadout Elevation View 1
5-5	Loadout/Stockpile Elevation View 2
5-6	Office Elevation View
5-7	Maintenance Shop Elevation View
5-8	Wash Bay, Oil and Fuel Storage Elevation View

Coal Recovery (5-9 to 5-14)

5-9	Coal Extraction Overview
5-10	Coal Removal Sequence
5-11	Shallow Coal Recovery Cover Cross Section
5-12	Deep Coal Recovery Cross Section
5-13	Strip Ratio Isopach
5-14	Coal Thickness Isopach

Overburden Handling (5-15 to 5-19)

5-15	Overburden Isopach
5-16	Overburden Removal Sequence
5-17	Overburden Removal Stage 1
5-18	Overburden Removal Stage 2
5-19	Overburden Removal Stage 3

Robinson Creek Diversion (5-20 to 5-21)

- 5-20 Robinson Creek Diversion Plan View
- 5-21 Robinson Creek Diversion Cross Sections/Detail

Transportation (5-22 to 5-24)

- 5-22 Primary Roads Plan View
- 5-23 Primary Roads Cross Sections/Detail
- 5-24 Ancillary Roads Typical Cross Section

Sedimentation Diversions/Impoundments (5-25 to 5-34)

- 5-25 Diversion Ditch and Sediment Impoundment Plan View
- 5-26 Sediment Impoundment Watersheds
- 5-27 Diversion Ditch Watersheds
- 5-28 Sediment Impoundment 1 Details
- 5-29 Sediment Impoundment 2 Details
- 5-30 Sediment Impoundment 3 Details
- 5-31 Sediment Impoundment 4 Details
- 5-32 Impoundment Spillway Detail
- 5-33 Diversion Ditch 1 Details
- 5-34 Diversion Ditch 2, 3 and 4 Details

Reclamation/Regrading (5-35 to 5-38)

- 5-35 Post Mining Topography Preferred Scenario
- 5-36 Post Mining Topography Preferred Scenario Cross Sections
- 5-37 Post Mining Topography Alternate Scenario
- 5-38 Reclamation Sequence

Geotechnical (5-39)

- 5-39 Geotechnical Samples and Boring Locations

CHAPTER 5

R645-301-500. ENGINEERING

510. INTRODUCTION.

The engineering section of the Mining and Reclamation Plan (MRP) is divided into the operation plan, reclamation plan, design criteria, and performance standards. 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.

511. GENERAL REQUIREMENTS

511.100 - 511.300. Contents

The operation and reclamation permit application includes descriptions of the coal mining and reclamation operations with attendant Drawings, plans, and cross sections. and its potential impacts to the environment as well as methods and calculations utilized to achieve compliance with design criteria.

All this information can be viewed in this section, Drawings 5-1 through 5-39 and Appendices A5-1 through A5-3.

512. CERTIFICATIONS

512.100. Cross Sections and Drawings.

All cross sections and Drawings required under applicable portions of sections 512.100 through 512.150 have been prepared by, or under the direction of, and certified by: a qualified, registered, professional engineer; a professional geologist; or a qualified, registered, professional land surveyor, with assistance from experts in related fields such as hydrology, geology and landscape architecture.

Compliance with this section has been completed and certifications are available on all cross sections and Drawings.

512.200. Plans and Engineering Designs.

All plans for excess spoil, durable rock fills, coal mine waste, impoundments, primary roads and variances from approximate original contour will be certified by a qualified registered professional engineer.

Plans for excess spoil, sediment impoundments, primary roads, and a variance from approximate original contour have been certified by a qualified registered professional

engineer. These certifications can be viewed on Drawings 5-22 through 5-37. No coal mine waste or durable rock fills are planned.

512.210 Excess Spoil Disposal Areas

A professional engineer experienced in the design and construction of earth and rock fills will certify the design of Excess Spoil Disposal Areas according to 535.100.

A professional engineer with experience in design and construction of earth and rock fills has certified the design of the Excess Spoil Disposal according to 535.100. An expert in the field of slope stability and geotechnical analysis has provided a thorough review of the design. This analysis can be viewed in Appendix A5-1.

512.220 - 230 Durable Rock Fills and Coal Mine Waste Structures

The MRP does not contemplate the construction of any permanent Durable Rock Fills or Coal Mine Waste structures. If such structures become part of the plan, a professional engineer experienced in the design of earth and rock fills and or disposal facilities will certify the design according to 535.100 - 536.

512.240. Impoundments.

A professional engineer experienced in the design and construction of impoundments will use current, prudent, engineering practices and will certify the design of the impoundment according to 743.

A professional engineer experienced in the design and construction of impoundments with assistance from a geotechnical expert has used current, prudent, engineering practices to design the proposed impoundments. The plans have been certified and a detailed geotechnical analysis has been provided. The certifications and drawings can be viewed in Drawings 5-25 through 5-31 and Appendices A5-1 and A5-2.

512.250. Primary Roads.

A professional engineer will certify the design and construction or reconstruction of primary roads as meeting the requirements of 742.420.

Designs of primary roads have been certified as meeting the requirements of 742.420.

512.260. Variance From Approximate Original Contour.

In areas of the MRP where a variance from the approximate original contour is required, a professional engineer will certify the design for the proposed variance from the approximate original contour, as described under 270, in conformance with professional standards established to assure the stability, drainage and configuration necessary for the intended use of the site.

A variance from the approximate original contour has been certified in conformance with professional standards to assure the stability, drainage and configuration necessary for the intended use of the site.

513. COMPLIANCE WITH MSHA REGULATIONS AND MSHA APPROVALS.

513.100. Coal Processing Waste Dams and Embankments

Not applicable

513.200. Impoundments and Sedimentation Ponds

No impoundments or sedimentation ponds meeting the size or other qualifying criteria of MSHA, 30 CFR 77.216(a) exist or are planned within the proposed Mine Permit Area. Should impoundments and sedimentation ponds meeting the size or other qualifying criteria of MSHA, 30 CFR 77.216(a) become necessary, compliance with the requirements of MSHA, 30 CFR 77.216 will be met.

513.300. Disposal of Underground Development Waste, Coal Processing Waste and Excess Spoil in underground mine workings.

Not applicable

513.400. Refuse Piles

Not Applicable

513.500. Capping, Sealing and Backfilling Openings to the Surface from the Underground.

Each shaft, drift, adit, tunnel, exploratory hole, entryway or other opening to the surface from the underground will be capped, sealed, backfilled or otherwise properly managed consistent with MSHA, 30 CFR 75.1711

All wells will be managed to comply with R645-301-748 and R645-301-765. Water monitoring wells will be managed on a temporary basis according to R645-301-738.

Wells constructed for monitoring groundwater conditions in the proposed Coal Hollow Mine permit and adjacent area, including exploration holes and boreholes used for water wells or monitoring wells, will be designed to prevent contamination of groundwater and surface-water resources and to protect the hydrologic balance. A diagram depicting typical monitoring well construction methods is shown in Figure 7-11. Monitoring wells will include a protective hydraulic seal immediately above the screened interval, an annular seal plugging the borehole above the hydraulic seal to near the ground surface, and a concrete surface seal extending from the top of the hydraulic seal to the ground surface which is sloped away from the well casing to prevent the entrance of surface

flows into the borehole area. Well casings will protrude above the ground surface a sufficient height so as to minimize the potential for the entrance of surface water or other material into the well. A steel surface protector with a locking cover will be installed at monitoring wells to prevent access by unauthorized personnel. Where there is potential for damage to monitoring wells, the wells will be protected through the use of barricades, fences, or other protective devices. These protective devices will be periodically inspected and maintained in good operating conditions. Monitoring wells will be locked in a closed position between uses.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of “Administrative Rules for Water Well Drillers”, State of Utah, Division of Water Rights or other applicable state regulations. Abandonment of wells will be performed by a licensed water well driller. The wells to be abandoned will be completely filled using neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout, or other materials approved by the Utah State Engineer’s office. Alternatively, the well may be abandoned using a different procedure upon approval from the Utah State Engineer’s office.

Abandonment materials will be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the State Engineer by the responsible licensed driller giving data related to the abandonment of the well. This shall include the name of the licensed driller or other person(s) performing abandonment procedures, name of well owner at the time of abandonment, the address or location of the well by section, township, and range, abandonment materials and equipment used, water right or file number covering the well, the final disposition of the well, and the date of completion.

Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to minimize disturbance to the prevailing hydrologic balance. Exploration holes and

boreholes will be managed to ensure the safety of people, livestock, fish and wildlife, and machinery.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

If any exploration boreholes are to be used as monitoring wells or water wells, these will meet the provisions of R645-301-731

Boreholes will be backfilled to within 1 foot of the land surface with concrete or other materials approved by the Division as necessary to prevent contamination of groundwater or surface-water resources or to protect the prevailing hydrologic balance. The upper approximately 1 foot will be backfilled with native materials to facilitate reclamation (see Drawing 6-11). Exploration holes and boreholes that may be uncovered during mining and reclamation activities will be permanently closed unless approved for water monitoring or otherwise managed in a manner approved by the Division.

513.600. Discharges into an underground mine

Not Applicable

513.700. Surface Mining Closer than 500 Feet to an Active Underground Mine

Not Applicable

513.800. Coal Mine Waste Fires

Not Applicable

514. **INSPECTIONS**

All engineering inspections, will be conducted by a qualified registered professional engineer or other qualified professional specialist under the direction of the professional engineer.

514.100 – 140 Excess Spoil.

A professional engineer or specialist experienced in the construction of earth and rock fills will conduct inspections, provide reports certified by a registered professional engineer, and otherwise meet the requirements of R645-301-514.100 through R645-301-514.140.:

514.200 - 250. Refuse Piles.

Not Applicable

514.300. Impoundments.

514.310 - 313. Certified Inspection.

A professional engineer or specialist experienced in the construction of impoundments will inspect impoundments. Inspections will be made regularly during construction, upon completion of construction, and at least yearly until removal of the structure or release of the performance bond. The qualified registered professional engineer will promptly, after each inspection, provide to the Division, a certified report that the impoundment has been constructed and maintained as designed and in accordance with the approved plan and the R645 Rules. The report will include discussion of any appearances of instability, structural weakness or other hazardous conditions, 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. A copy of the report will be retained at or near the mine site.

514.320. Inspection Standard and Frequency

The MRP does not contemplate construction of any impoundments meeting the NRCS Class B or C criteria for dams in TR-60, or the size or other criteria of 30 CFR Sec. 77.216. If such impoundments become necessary, they will be examined in accordance with 30 CFR Sec. 77.216-3. Impoundments not meeting the NRCS Class B or C Criteria for dams in TR-60, or subject to 30 CFR Sec. 77.216, will be examined at least quarterly. A qualified person designated by Alton Coal Development LLC will examine impoundments for the appearance of structural weakness and other hazardous conditions.

515. **REPORTING AND EMERGENCY PROCEDURES**

515.100. Slides

Any time a slide occurs which may have a potential adverse effect on public, property, health, safety, or the environment, Alton Coal Development LLC will notify the Division by the fastest available means and comply with any remedial measures required by the Division.

515.200. Impoundment Hazards.

If any examination or inspection of an impoundment discloses that a potential hazard exists, the person who examined the impoundment will promptly inform the Division of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the Division will be notified immediately.

515.300. Temporary Cessation

515.312.

During a temporary cessation, surface facilities in areas in which there are no current operations, but in which operations are to be resumed under an approved permit will be effectively secured.

515.320.

Before temporary cessation of coal mining and reclamation operations for a period of 30 days or more, or as soon as it is known that a temporary cessation will extend beyond 30 days, a notice of intention to cease or abandon operations will be submitted to the division. This notice will include:

- A statement of the exact number of acres which have been affected in the permit area prior to such temporary cessation,
- The extent and kind of reclamation of those areas which has been accomplished, and
- Identification of the backfilling, regrading, revegetation, environmental monitoring, and water treatment activities that will continue during the temporary cessation.

516. **PREVENTION OF SLIDES**

The moderate topography in the area of the planned Coal Hollow Mine will minimize the potential for unplanned slides. A natural barrier will, however, be left undisturbed except as necessary for roads, sedimentation control, temporary topsoil and spoil storage and similar features, beginning at the elevation of the coal seam and extending from the outslope for a distance of at least 50 ft. The barrier will be retained in place to prevent slides and erosion.

520. **OPERATION PLAN.**

521. **GENERAL.**

The proposed Coal Hollow Mine is located approximately 2.5 miles south of Alton, Utah. In order to maximize the use and conservation of the coal resource, coal will be recovered using large hydraulic excavators or front end loaders and off-road trucks. Mined coal will be hauled to a central coal area for crushing and placement into a stockpile. Coal from the stockpile will be transferred into a bin and loaded into over the road trucks for transport.

The plan, with Drawings, cross sections, narrative, descriptions, and calculations indicates how the relevant requirements will be met. The lands subject to coal mining and reclamation operations over the estimated life of the operations are identified and briefly described. All appropriate information is located in the subsequent sections and

Drawings 5-1 through 5-39 and Appendices A5-1 through A5-3. Topsoil piles and removal sequencing is shown on Drawing 2-2.

521.100. Cross Sections and Drawings.

The application includes cross sections, Drawings and plans showing all the relevant information required by the Division. Appropriate information is provided in Drawings and cross sections 5-1 through 5-39.

521.110. Previously Mined Areas.

Not Applicable

521.120. Existing Surface and Subsurface Facilities and Features.

521.121. Buildings

The location of all buildings in and within 1,000 feet of the proposed permit area, with identification of the current use of the buildings are shown on Drawing 1-1.

521.122. Surface and Subsurface Man-Made Features

Not Applicable

521.123. Public Roads

One public road, Kane County Road 136 is located in or within 100 feet of the proposed permit area and is shown on Drawing 5-3.

521.124. Existing areas of spoil, waste, coal development waste, and noncoal waste disposal, dams, embankments, other impoundments, and water treatment and air pollution control facilities.

Not Applicable

521.125. Ponds and Other Impoundments

The MRP does not contemplate construction of any permanent water impoundments; coal processing waste banks and coal processing waste dams or embankments. The planned location of each sedimentation pond is shown on Drawing 5-3.

521.130. Landowners and Right of Entry and Public Interest Drawings.

All boundaries of lands and the names of present owners of record of both surface and subsurface within the Mine Permit Area are shown on Drawing 1-3 (Surface) and Drawing 1-4 (Subsurface).

521.132. Permit Boundary

The boundaries of land within the proposed permit area are shown on all applicable Drawings.

521.133. Public Roads

No mining or reclamation operations are planned within 100 ft. of a public road. However mine vehicles may cross the right-of-way of Kane County Road #136 for a short period early in the operation's life. Appropriate measures, including signage and mine operating practices and training will be implemented to protect the public.

521.133.2 Relocating a Public Road:

The design of any relocated road will be approved by Kane County authorities, or such other authorities as have jurisdiction. Appropriate measures will be taken to prevent entrance into the mining area via the pre-existing road, and appropriate signage and barriers will be installed to protect the public.

521.140. Mine Drawings and Permit Area Drawings.

521.141 The boundaries of all areas proposed to be affected over the estimated total life of the coal mining and reclamation operations, with a description of size, sequence and timing of the mining, the coal mining and reclamation operations to be conducted, the lands to be affected throughout the operation, and changes in facilities or features to be caused by the proposed operations;

These items are depicted on Drawings 5-1 through 5-38.

521.143 The proposed disposal sites for placing excess spoil generated at surface areas affected by surface operations and facilities for the purposes COAL MINING and RECLAMATION ACTIVITIES according to:

- *R645-301-211: The applicant will present a description of the premining soil resources as specified under R645-301-221. Topsoil and subsoil to be saved under R645-301-232 will be separately removed and segregated from other material.*

The soil resources for the proposed excess spoil disposal area are described in A2-1. A plan has been developed for removal of topsoil and suitable subsoil based on the soil descriptions in this appendix. The handling plan can be viewed on Drawing 2-2. Topsoil and acceptable subsoil will be separately removed and segregated from other material prior to placement of any spoil.

- *R645-301-212: After removal, topsoil will be immediately redistributed in accordance with R645-301-242, stockpiled pending redistribution under R645-*

301-234, or if demonstrated that an alternative procedure will provide equal or more protection for the topsoil, the Division may, on a case-by case basis, approve an alternative;

Excess spoil will have topsoil and subsoil redistributed in an approximately uniform, stable thickness with the approved post mining land use, contours and surface water drainage systems. Material handling practices will prevent excess compaction of these materials. Handling practices will also protect the materials from wind and water erosion before and after seeding and planting.

- *R645-301-412.300: Criteria for Alternative Postmining Land Uses.*

Not Applicable

- *R645-301-512.210: Excess Spoil. The professional engineer experienced in the design of earth and rock fills will certify the design according to R645-301-535.100.*

A professional engineer experienced in the design of earth and rock fills with assistance from a geotechnical expert has certified the design according to R645-301-535.100. These certifications can be viewed on Drawings 5-35, 5-36 and 5-17 through 5-19.

- *R645-301-512.220: Durable Rock Fills*

No durable rock fills are planned.

- *R645-301-514.100: Excess Spoil. The professional engineer or specialist will be experienced in the construction of earth and rock fills and will periodically inspect the fill during construction. Regular inspections will also be conducted during placement and compaction of fill materials.*

A professional engineer or specialist that is experienced in the construction of earth and rock fills will inspect the fill during construction and regular inspections will also be conducted during placement and compaction of fill materials.

- *R645-301-528.310: Excess spoil will be placed in designated disposal areas within the permit area, in a controllable manner to ensure mass stability and prevent mass movement during and after construction. Excess spoil will meet the design criteria of R645-301-535. For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, the permit application must include a description of the proposed disposal site and the design of the spoil disposal structures according to R645-301-211, R645-301-212, R645-301-412.300, R645-301-512.210, R645-528.310, R645-301-535.100 through R645-301-535.130, R645-301-535.300 through R645-301-535.500, R645-536.300, R645-301-*

542.720, R645-301-553.240, R645-301-745.100, R645-301-745.100, R645-301-745.300, and R645-301-745.400.

Excess spoil will be placed in the area designated on Drawing 5-3 and 5-35. This fill will be placed in lifts not to exceed 4 feet. The material will be transported from the overburden removal area to the fill by end dump haul trucks and a dozer(s) will spread the spoil to this lift thickness. The fill will meet at minimum 90% compaction as related to the standard Procter. Final slopes will be regraded to a maximum slope of 3h:1v. The top of the fill will be sloped to approximately 2% to prevent pooling of water and to reestablish drainage similar to original flow patterns. The excess spoil placed on the non-mined areas is approximately 32 acres and varies in height from 35 to 110 feet. The area of excess fill over mined out areas (variance from approximate original contour) is an extension of the fill placed on the non-mined area and is approximately 55 acres. Combined acreage of the excess fill placed on mined and non-mined areas is 87 acres and varies in height from 60 to 100 feet above original contour. Total excess fill is 8.6 million yards. Design of this fill can be viewed in Drawings 5-35 through 5-36 and the geotechnical study can be viewed in Appendix A5-1.

- *R645-301-535.100 through R645-301-130: Disposal of Excess Spoil*

A geotechnical analysis of the excess spoil structure design has been completed by an expert in this field. The long term static safety factor for this structure design is estimated at 1.7 to 1.8. Lifts will be placed in thicknesses not to exceed 4 feet. The lifts will meet 90% compaction by the standard Procter. The fill will be graded to allow for drainage similar to original patterns and to prevent excessive infiltration of water. Fill will be covered with subsoil and topsoil as specified in Chapter 2 to provide conditions suitable for revegetation of the area. The geotechnical study can be viewed in Appendix A5-1.

- *R645-301-535.300 through R645-301-535.500: Disposal of Excess - Spoil Durable Rock Fills.*

Not Applicable

- *R645-301-536.300: Disposal of Coal Mine Waste in Excess Spoil*

No coal mine waste is planned in the excess spoil area.

- *R645-301-542.720: Excess spoil will be placed in designated disposal areas within the permit area, in a controlled manner to ensure that the final fill is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use. Excess spoil that is combustible will be adequately covered with noncombustible material to prevent sustained combustion. The reclamation of excess spoil will comply with the design criteria under R645-301-553.240.*

The excess spoil as shown in Drawing 5-35 and 5-36 will be suitable to the surrounding area and for the postmining land use of primarily grazing. No combustible excess spoil will be placed in the proposed structure. The reclamation of the spoil does not include any terraces and the slopes will not exceed 3h:1v.

- *R645-301-553.240: The final fill configuration of the fill (excess spoil) will be suitable for the approved postmining land use. Terraces may be constructed on the outslope of the fill if required for stability, control of erosion, to conserve soil moisture, or to facilitate the approved postmining land use. The grade of the outslope between terrace benches will not be steeper than 2h:1v (50 percent).*

The excess spoil as shown in Drawings 5-35 and 5-36 will be suitable to the surrounding area and for the postmining land use of primarily grazing. The reclamation of the spoil does not include any terraces and the slopes will not exceed 3h:1v. The long term static safety factor for these slopes is estimated to be 1.7 to 1.8.

- *R645-301-745.100: General Requirements.*

745.110: Excess Spoil will be placed in designated disposal areas within the permit area, in a controlled manner to:

745.111: Minimize the adverse effects of leaching and surface water runoff from the fill on surface and underground water;

Reclamation of the excess spoil will include topsoil and a subsoil layer. Infiltration through the reclamation is expected to be minimal based on the high clay content of these soils. In addition, laboratory data for the overburden shows that there is minimal potential for leaching of pollutants should infiltration rates become higher than expected.

The foundation of the excess spoil area also has high clay content with minimal potential for infiltration. This will provide an additional, natural barrier to protect ground water present beneath the proposed structure.

745.112: Ensure permanent impoundments are not located on the completed fill. Small depressions may be allowed by the Division if they are needed to retain moisture or minimize erosion, create and enhance wildlife habitat or assist revegetation, and if they are not incompatible with the stability of the fill; and

Permanent impoundments are not planned on the excess spoil area. Small depressions may be constructed as allowed by the Division to retain moisture, minimize erosion, create and enhance wildlife habitat or assist revegetation.

745.113: Adequately cover or treat the excess spoil that is acid- and toxic forming with nonacid nontoxic material to control the impact on the surface and ground water in accordance with R645-301-731.300 and to minimize adverse effects on plant growth and approved postmining land use.

Laboratory data representative of the overburden planned for disposal in the excess spoil area does not show acid- and toxic forming characteristics.

745.120: Drainage Control. If the disposal area contains springs, natural or manmade water courses, or wet weather seeps, the fill design will include diversions and underdrains as necessary to control erosion, prevent water infiltration into the fill and ensure stability.

A spring and seep survey available in Chapter 7 has identified no springs or wet weather seeps in the proposed excess spoil area. The final surface will be regraded to a contour that will route water from snowmelt and rainfall around the excess spoil as shown on the final contours Drawing 5-35. There are no manmade water courses present in the excess spoil area. No underdrains are planned for the excess spoil structure.

745.121: Diversions will comply with the requirements of R645-301-742.300

No diversions are planned in the excess spoil area.

745.122 : Underdrains

No underdrains are planned in the excess spoil area.

745.300: Durable Rock Fills

Not Applicable

745.400: Preexisting Benches

Not Applicable

521.150. Land Surface Configuration Drawings.

Surface contours representing the existing land surface configuration of the proposed permit area are shown on Drawing 5-1 and the post mining land configuration is shown on 5-35. Cross sections with both these landforms are shown on Drawing 5-36. The premining landform, with exception of the Facilities area and Lower Robinson Creek, are from an aerial flight that was limited to a five foot contour interval. Therefore, contours have been interpolated down to a 2 foot level using the available aerial flight information. This interpolation provides accuracy for the Division to make the necessary

determinations. The Facilities area and portions of Lower Robinson Creek are actual survey data to the accuracy of 2 foot contours.

521.160. Maps and Cross sections of the Proposed Features for the Proposed Permit Area. These maps and cross sections will clearly show:

521.161 Buildings, utility corridors, and facilities to be used:

These items are shown on Drawings 5-3 through 5-8.

521.162 The area of land to be affected within the proposed permit area, according to the sequence of mining and reclamation:

A yearly and overall disturbance sequence for the permit area is provided on Drawing 5-2.

521.163 Each area of land for which a performance bond or other equivalent guarantee will be posted under R645-301-512;

The area of land that will have a performance bond posted is shown on Drawing 5-3.

521.164 Each coal storage, cleaning and loading area. The map will be prepared and certified according to R645-301-512;

These facilities can be viewed on Drawings 5-3 through 5-5.

521.165 Each topsoil, spoil, coal preparation waste, underground development waste, and noncoal waste storage area. The maps will be prepared and certified according to R645-301-512;

Topsoil storage areas and handling can be viewed on Drawing 2-2. Spoil placement and the excess spoil structure can be viewed on Drawings 5-3, 5-17, 5-18, 5-19, 5-35 and 5-36.

521.166 Each source of waste and each waste disposal area relating to coal processing or pollution control;

Only sizing of the coal is proposed. This process will not produce any waste.

521.167 Each explosive storage and handling facility;

Need for these facilities are not anticipated at this time. Should these facilities become necessary, appropriate drawings will be provided to the Division.

521.168 For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, each air pollution collection and control facility; and

There are no specific air pollution collection or control facilities proposed.

521.169 Each proposed coal processing waste bank, dam or embankment. The map will be prepared and certified according to R645-301-512.

Not applicable

521.170. Transportation Facilities Drawings.

Transportation facilities for the Coal Hollow Mine include two primary haul roads, a conveyor system, and miscellaneous ancillary/temporary roads. Numerous drawings detail the designs and specifications for each one of the proposed facilities. The following is a description of each facility and a reference for the associated drawings:

- Roads: Two primary haul roads are planned within the permit area. The first road extends from the coal unloading area to the first series of pits along the west side of the property. This road will be utilized for access to pits 1 through 15 (pits shown on Drawing 5-10). This road will be approximately 2,600 feet in length and will be utilized mainly during the first two years of mining. There will be three culverts installed along this road all sized for a 100 year, 24 hour storm event. The first culvert will be across a tributary of Lower Robinson Creek and will be a 36 inch corrugated steel pipe. The second culvert is the main crossing over Lower Robinson Creek and is a 96 inch corrugated steel pipe. Both of these culverts have been sized based on analysis of the Lower Robinson Creek watershed. This analysis can be viewed in Appendix A5-3. The third culvert is crossing over a diversion ditch that will route water mainly from disturbed areas along the south side of Lower Robinson Creek to a sediment impoundment. This culvert will be a 24 inch corrugated steel pipe.

The second road extends from an intersection with the first road, located just south of the Lower Robinson Creek crossing, and proceeds south to approximately pit 25. This road is approximately 2,500 feet in length and will be used for the south pits 16 through 30. There is one culvert crossing along this road to cross a diversion ditch. This culvert will be a 24 inch culvert sized for maximum anticipated flows in the diversion.

The following specifications apply to these Primary roads:

- 1) Roads will be approximately 80' in width
- 2) Approximately a 2% crown
- 3) Approximately one foot deep cut ditches along shoulders for controlling storm water
- 4) 18" of crushed rock or gravel for road surfacing
- 5) Cut and fill slopes of 1.5 h:1v
- 6) Minimum fill over each culvert will be 2 times diameter of culvert
- 7) Berms placed as necessary along fills

The ancillary roads will have similar specifications except surfacing will occur only as needed and may be narrowed to a 40 foot road width.

The location and details for all these roads can be viewed on Drawings 5-3 and 5-22 through 5-24.

The ramps, benches and equipment travel paths within the active surface mining area are temporary in nature and will be relocated frequently as mining progresses. These temporary travelways are considered part of the pit due to their short term use, and are not individually designed nor engineered. They will be built and maintained to facilitate safe and efficient mine and reclamation operations.

- **Conveyors:** A conveyor system will be used to stockpile coal and to load highway approved haul trucks for transportation to market. The first conveyor is mainly a stacker system for the coal stockpile which will be located at the coal unloading area and will be approximately 575' in length. This conveyor is estimated to be a 54" solid frame system.

The second conveyor is a coal reclaim belt that will be loaded from chutes beneath the coal stockpile and will convey coal to the loadout chute which will load the highway approved coal haulage trucks. This section will be approximately 222' in length. Similar to the first section, this conveyor is estimated to be a 54" solid frame system.

Drawings of this system can be viewed on Drawings 5-3 through 5-5.

521.180. Support facilities.

The mine support facilities will include an office, shop, wash bay, oil containment, fuel containment, coal stacking system, and a coal loadout system. These facilities will be constructed on an isolated section of the permit area that is approximately 29 acres. This area is located immediately north of Lower Robinson Creek, in Township 39 South, Range 5 West, Section 19. A diversion ditch will route water from the upgradient area immediately east of the area around the facilities area and into a tributary of Lower Robinson Creek as shown on Drawing 5-3. Storm water and snow melt that occurs within the facilities area will be routed to an impoundment that will contain sediment. This impoundment will have a drop-pipe spillway installed that will allow removal of any oil sheens that may result from parking lots or maintenance activities by using absorbent materials to remove the sheen. Details for this impoundment can be viewed on Drawing 5-28.

The following is a detailed description of each proposed facility and a reference to where detailed drawings can be found:

- Office: The office will be located on the northwest corner of the facilities area, immediately adjacent to the facilities access road. This building will be a steel structure with concrete footers. This structure will be 150 feet long by 100 feet wide and will be two stories in height. The office will provide working space for administrative and technical personnel. Details for the office can be viewed on Drawings 5-3 and 5-6.
- Shop: The shop will be located on the northeast side of the facilities area. This building will be a steel structure with concrete floors and foundation. The structure will be approximately 200 feet long by 100 feet wide and 50 feet high. This building will be used for maintenance of equipment, parts storage, tool storage, and office space for maintenance personnel. Details for this building can be viewed on Drawings 5-3 and 5-7.
- Wash Bay: The wash bay will be located immediately east of the shop. This building will be a steel structure with a concrete foundation. The structure will be 50 feet long by 60 feet wide and 50 feet high. Included will be a closed circuit water recycle system. This system will eliminate and store water impurities and reroute water back through the wash bay for cleaning equipment. Details for this structure can be viewed on Drawings 5-3, 5-8, and Appendix A5-4.
- Oil and Fuel Containments: The oil and fuel containments will be concrete structures appropriately sized for storage. The oil containment will contain 55 gallon barrels and up to 2,000 gallon totes. This containment will be 80 feet long by 30 feet wide and 3 feet deep. The fuel containment will store 3 fuel tanks. Included will be a 4,000 gallon unleaded fuel tank and two 12,000 gallon diesel tanks. This structure will 50 feet long by 30 feet wide and 3 feet deep. Details for this structure can be viewed on Drawings 5-3 and 5-8.
- Coal Stacking System: The coal stacking system will be located in the central part of the facilities area. This system will include a coal hopper, coal feeder breaker, feed conveyor, crusher, and an inclined conveyor belt. Trucks will dump coal into the coal hopper which will funnel coal through the feeder breaker onto a short feed conveyor belt. This conveyor belt will transport the coal approximately 253 feet to a crusher that will size the coal appropriately for market. Once the coal is sized through the crusher, it will enter an inclined stacker conveyor belt that is angled at approximately 16 degrees and is 322 feet long. This system will be a radial conveyor which will feed a coal stock pile with a live storage of approximately 150,000 tons. This system can be viewed on Drawings 5-3 through 5-5.
- Coal Loadout System: The coal loadout system will be located in the central part of the facilities area. This system will include feeder chutes, a coal reclaim conveyor and an inclined conveyor. The feeder chutes will be located beneath the coal stockpile and provide a method for loading the coal onto the reclaim conveyor. The coal reclaim system includes two sections of conveyor. One conveyor is approximately 480 feet in length and the other is 260 feet. These conveyor sections feed an inclined belt that puts coal into the loadout hopper. This loadout hopper will load highway approved haul trucks that transport coal to market.

During mine development and the initial mining period, some facilities of a temporary nature such as mobile buildings and crusher/stacking conveyors may be utilized.

521.200. Signs and Markers Specifications.

Signs and markers will be posted, maintained, and removed by Alton Coal Development LLC. Signs and markers will be a uniform design that can be easily seen and read; made of durable material; conform to local laws and regulations, and be maintained during all activities to which they pertain;

521.240. Mine and Permit Identification Signs.

Identification signs showing the name, business address, and telephone number of Alton Coal Development LLC and the identification number of the permanent program permit authorizing coal mining and reclamation operations will be displayed at each point of access to the permit area from public roads, and will be retained and maintained until after the release of all bonds for the permit area;

521.250. Perimeter Markers.

The perimeter of a permit area will be clearly marked before the beginning of surface mining activities;

521.260. Buffer Zone Markers.

Buffer zones will be marked along their boundaries as required under 731.600

521.270. Topsoil Markers.

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

522. COAL RECOVERY.

The MRP is designed to maximize recovery of the coal resource within technological, safety and legal limitations. Coal will be recovered from the Smirl Seam which ranges in thickness from 13.5 to 18.5 feet averaging approximately 16 feet in the planned mining area. The Smirl Seam is the only surface mineable seam in the permit area. Isopach maps of the coal thickness and strip ratio can be viewed on Drawings 5-13 and 5-14

Some coal along the boundaries of the mine area will not be recovered in conjunction with the proposed operation. This includes coal underlying the pit highwalls and areas where drainage or sedimentation control structures (diversions, ditches, ponds, etc) are located. The mine is designed to minimize such losses by locating haulage ramps in the spoil rather than on the pit wall, by oversteepening the coal face at the pit edges, and by minimizing the use of out of pit ancillary roads. Coal which is left in place in these areas may be recovered in the future when adjacent property rights are secured. Current plans are for a planned maximum mining depth of approximately 200 ft. and a strip ratio of 10:1; however, the ultimate mining depth will depend on cost related factors.

A detailed mine plan has been developed for the proposed permit area and the following table along with Drawing 5-9 summarize the coal extraction for the permit area:

Description	Extraction Status	Average Coal Thickness (ft)	Average Strip Ratio* (yd ³ /Ton)	Quantity (**Ton)
Total Coal within Permit Boundary	N/A	16.3	7.7	9,159,000
High Strip Ratio Area (NE corner of permit area)	Not Mined	16.5	13.5	2,764,000
Coal under highwalls and sedimentation structures	Not Mined	17.2	4.8	1,207,000
Coal under Robinson Creek Diversion	Not Mined	15.5	3.9	172,000
Recoverable Coal	Mined	16.3	6.4	5,016,000

*All strip ratios are bank cubic yards of overburden to tons of coal

**All coal tons are based on a 95% recovery factor

The application of highly flexible, open pit truck/shovel techniques will minimize losses of coal due to pit geometry or spoil support requirements, allowing the maximum possible exposure of the coal resource. The full seam section will be loaded primarily using large hydraulic backhoes. The backhoes, which can work from the top of the seam, provide the ability to efficiently and cleanly excavate the lower part of the coal seam without disturbing the pit floor. This, along with the machine's high degree of bucket horizon control will minimize floor losses. The backhoes can also work safely from the top of the seam to oversteepen the loading face along the pit walls, thus recovering the maximum amount of coal.

Where pit geometry or operational factors preclude the use of backhoes for loading, a large rubber tire front end loader will be used. These machines provide similar horizon control, can operate on the floor of the pit or on an intermediate bench, and can recover coal from confined areas such as the ends of the pits.

Rear dump haul trucks, loaded by the backhoes or front end loader, will be used to move the coal from the pit via in-pit roads and the primary haulroad to the crusher and stockpile. The trucks will be equipped with "combo" beds suitable for hauling both coal and overburden, and configured to minimize coal spillage.

A net recovery of 95% (including the effects of in-pit coal losses and out-of-seam dilution) of the coal exposed in the pit is anticipated. Normal coal losses are expected due to cleaning of the top of the seam, loading losses at the seam floor, and coal oxidation near the outcrop.

No coal washing is contemplated at this time, thus there will be no coal processing losses.

Maps and cross sections providing detailed information related to coal recovery activities can be viewed on Drawings 5-9 through 5-14.

523. MINING METHOD(s).

The Coal Hollow Mine will be a surface coal mining operation using open pit mining methods to produce up to 2 million tons of coal per year. Primary mining equipment will include hydraulic excavators and end-dump mining trucks. The coal will be crushed at the mine site, and hauled to market in over-the-road coal trucks.

The mine is planned to produce approximately 5.02 million tons of coal over a life of approximately 3 years. The estimated production schedule is summarized below:

	Tons Produced
Year	(000)
1	2,000
2	2,000
3	1,016
Total	5,016

Initial mine development will involve removal and storage of topsoil from mine infrastructure locations. Facilities for equipment maintenance/warehouse, coal handling, and offices will be constructed. During the development and initial mining period, facilities temporary in nature may be used until permanent facilities can be built. Construction of sedimentation ponds, diversion ditches, and mine roads accessing the initial mining areas will also be ongoing.

Mining will employ typical open pit methods using truck/loader type equipment to remove overburden and recover the coal. Mining will advance across the property in successive cuts approximately 250 ft. in width and 800 to 1,300 ft. long (generally equal to the width of the property less property barriers). Layout of these pits can be viewed on Drawing 5-10. The overburden will be removed in layers or lifts approximately 20 to 40 feet deep. In practice, these overburden lifts are mined in a stairstep fashion ahead of the coal removal operation to provide adequate working room for the equipment and stable advancing slopes. Once mining is complete, excavated overburden (spoil) from a successive cut is used to backfill the excavation. General cross sections of this process can be viewed on Drawings 5-11 and 5-12.

Prior to beginning mining, the area will be cleared of vegetation, and the topsoil will be recovered and either stockpiled or live hauled to regraded areas. It is not anticipated that blasting of the overburden will be necessary based on drilling data. Should this process become necessary, this is the phase where it would be implemented. Overburden will then be removed using large hydraulic excavator(s) or front end loaders and off-road trucks which will haul the spoil and place it in parts of the pit where the coal has been removed, or in the excess spoil area shown on Drawings 5-3 and 5-35. Overburden is

removed in successively deeper benches until the coal seam is exposed. Some overburden in lower lifts may be moved by direct dozing into the mined out pit by large bulldozers.

When overburden removal is finished in a particular pit, the top of the coal will be cleaned (removal of any roof rock or other non-coal material on top of the seam) using a motor grader, dozer or front end loader. The material removed will be placed in the adjacent mined out pit. If necessary, the coal seam will be loosened by drilling and blasting or ripping prior to loading. Drilling and blasting of the coal is not expected to be necessary. The cleaned, exposed coal is then excavated by backhoe or front end loader and placed into off-road rear dump trucks.

Once the coal is removed, the pit will be backfilled by spoil from adjacent mine pits. Spoil will be placed in lifts and spread with a dozer. Once the pit is backfilled to the planned final surface contour, suitable topsoil and subsoil will be replaced, and the area reseeded. Revegetation work will proceed seasonally as appropriate for planting.

Overburden excavation and coal mining at Coal Hollow will begin near the subcrop of the coal seam at the western end of the permit area in the NW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 30, T39S, R5W. Topsoil will be removed and stored separately in topsoil stockpiles as shown on Map 2-2. Overburden from the initial pits will be hauled to the excess spoil pile east of the mining area. Once the initial pits are established, as much spoil as possible will be placed directly in the pit backfill, allowing reclamation to closely follow mining. This initial phase includes pits 1 through 8 as shown on Drawing 5-10. The mining and reclamation process for this phase can be viewed on Drawing 5-17.

From the initial mining area, operations will proceed eastward through the NE $\frac{1}{4}$ of Section 30 to the NW $\frac{1}{4}$ of Section 29 (as shown on Drawing 5-10). The mining and reclamation process for this phase can be viewed on Drawing 5-18. The pit will then turn south, and advance to the north edge of Section 31 T39S, R5W. This mining and reclamation phase can be viewed on Drawing 5-19. As shown on Drawing 5-19, the final pits will not be backfilled at this stage. The proposed method for filling these pits back to approximate original contour will be accomplished by utilizing overburden from the pit(s) in the adjacent federal reserves located immediately west of this area. Alton Coal Development, LLC is currently in the process of an Environmental Impact Study for these reserves with the intent of acquiring the rights to mine. It is expected that these rights will be acquired prior to the completion of the final phase in the proposed Permit Area. The final landform for the Permit Area is shown on Drawings 5-35 and 5-36.

In the case that Alton Coal Development, LLC is not successful with acquiring the rights to the adjacent federal coal reserves, spoil will be rehandled from the excess spoil and variance from the approximate original contour to fill the remaining pits. The final landform for this alternate scenario is shown on Drawing 5-37.

An estimate of the primary mining equipment planned for use at the Coal Hollow Mine is listed below:

Diesel - Hydraulic Excavators (15 to 38 cu. yd. capacity).
Rubber Tired Front End Loaders (8 to 20 cu. yd. capacity)
End Dump Trucks (100 to 240 ton capacity class)
Track Dozers (Caterpillar D7 through D11 Class)
Motor Graders (Caterpillar 16H to 24H Class)
Water Trucks (8,000 to 20,000 Gallon Class)

A variety of other equipment will also be used to support the mining operation.

Proposed engineering techniques for meeting the proposed mining methods will include:

- Design support for roads, pits, sediment impoundments etc...
- Field staking of designs utilizing high precision GPS survey systems.
- Weekly field engineering support to view and provide guidance related to designs and environmental controls.
- Ongoing geotechnical support for ensuring highwall stability
- As additional information becomes available, update geological models to ensure full recovery of resource.
- Weekly mine plans that specify appropriate engineering and environmental specifications.

There are no known underground mines within 500 feet of the permit boundary; therefore, no surface mining or reclamation activities will take place within 500 feet of any underground mine.

524. **BLASTING AND EXPLOSIVES**

As a result of the 2005 drilling program and overburden characterization, it was determined that the soil over the coal seam is void of any solid structure and that the overburden is extremely homogenous consisting of soft clay and soft shale. As results of this cursory investigation, it is anticipated that there would be no need to drill and blast the overburden to facilitate the removal of the spoil above the coal seam. Also, due to the fact that the coal will have to be mined from on top of the seam due to wet clay zone beneath the coal seam it is anticipated that there would be no need to drill and blast the coal seam to facilitate coal removal.

As a safeguard or fallback position if mining condition should change, all blasting and explosive criteria will be addressed.

Though not anticipated, explosives may be utilized as necessary at Coal Hollow Mine to break the overburden over the coal and may be used to break the coal for loading if necessary. In accordance with the requirements of this section, a blasting plan will be provided to MSHA and the Division. Each blasting plan will contain a description of any system to be used to monitor compliance with the standards of 524.600 including the type, capability, and sensitivity of any blast-monitoring equipment and the proposed procedures. Blasts that use more than five pounds of explosives or blasting agents will be conducted according to the schedule provided in 524.400.

524.100 Blaster Certification

Alton Coal Development LLC will, prior to conducting any surface blasting operations, ensure that all surface blasting incident to surface mining in Utah is conducted under the direction of a Utah Certified Blaster. Certificates of blaster certification will be carried by the blasters or will be on file at the mine permit area during blasting operations. A blaster and at least one other person will be present at the firing of a blast.

Persons responsible for blasting operations at a blasting site will be familiar with the blasting plan 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.

There are no dwellings, public buildings, schools, churches, or community or institutional building within 1,000 feet of the planned blasting area in the initial (year 1) mining period. There are also no underground mines within 500 feet of the permit. The anticipated blast design for blasts requiring more than five pounds of explosives or agents for blasts conducted within 1000 ft. of a dwelling, public building, school, church, or community or institutional building will be submitted for Division and MSHA approval, prior to blasting. The blast design will contain sketches of the drill and delay patterns, decking, type and amount of explosives required per blast, critical dimensions, design factors utilized to protect the public, general location drawings of protected structures, which meet the applicable airblast, flyrock, and ground vibration standards in 524.600.

The blast design will be prepared and signed by a Utah certified blaster.

524.300 - 350 Preblasting Survey

A preblasting survey will be conducted when more than five pounds of explosives or blasting agents are to be used. As part of the preblasting survey Alton Coal Development LLC will:

- Notify, in writing, all residents or owners of dwellings or other structures located within one-half mile of the permit area how to request a preblasting survey at least 30 days before initiation of blasting.
- Prepare a written report of any preblasting survey. A resident or owner of a dwelling or structure within one-half mile of any part of the permit area may request a preblasting survey. This request will be made, in writing, directly to Alton Coal Development LLC or to the Division, who will promptly notify Alton Coal Development LLC. Alton Coal Development LLC will promptly conduct a preblasting survey of the dwelling or structure and promptly prepare the written report. An updated survey of any additions, modifications, or renovation will be performed by Alton Coal Development LLC if requested by the resident or owner.

- Determine the condition of the dwelling or structure and will document any preblasting damage and other physical factors that could reasonably be affected by the blasting. Structures such as pipelines, cables, transmission lines, and cisterns, wells, and other water systems warrant special attention; however, the assessment of these structures may be limited to surface conditions and other readily available data.
- Require the written report of the survey be signed by the person who conducted the survey. Copies of the report will be promptly provided to the Division and to the person requesting the survey. If the person requesting the survey disagrees with the contents and/or recommendations contained therein, he or she may submit to both Alton Coal Development LLC and the Division a detailed description of the specific areas of disagreement.
- Complete any survey requested more than ten days before the planned initiation of blasting, before blasting occurs.

524.400 Blasting Schedule

524.420. Timing of Blasting

All blasting will be conducted between sunrise and sunset unless nighttime blasting is approved by the Division. Alton Coal Development LLC will conduct blasting operations at times approved by the Division and announced in the blasting schedule.

524.410. Unscheduled Blasts

Unscheduled blasts will be conducted only where public or operator health and safety so requires and for emergency blasting actions. When an unscheduled surface blast incidental to coal mining and reclamation operations is conducted, Alton Coal Development LLC, using audible signals, will notify residents within one-half mile of the blasting site and document the reason in accordance with 524.760.

524.450 - 453. Blasting Schedule Publication and Distribution.

Alton Coal Development LLC will:

- Publish the blasting schedule in a newspaper of general circulation in the locality of the blasting site at least ten days, but not more than 30 days, before beginning a blasting program;
- Distribute copies of the schedule to local governments and public utilities and to each local residence within one-half mile of the proposed blasting site described in the schedule; and
- Republish and redistribute the schedule at least every 12 months and revise and republish the schedule at least ten days, but not more than 30 days, before blasting

whenever the area covered by the schedule changes or actual time periods for blasting significantly differ from the prior announcement; and

524.460 - 465. Blasting Schedule Contents.

The blasting schedule will contain, at a minimum:

- Name, address, and telephone number of operator;
- Identification of the specific areas in which blasting will take place;
- Dates and time periods when explosives are to be detonated;
- Methods to be used to control access to the blasting area; and
- Type and patterns of audible warning and all-clear signals to be used before and after blasting.

524.500 - 532 Blasting and Warning Signs, Access Control

Blasting signs will read **“Blasting Area”** and be conspicuously placed along the edge of any blasting area that comes within 100 feet of any public right-of-way, and at the point where any other road provides access to the blasting area. At all entrances to the mine permit area from public roads or highways, signs will be conspicuously placed which read **“Warning! Explosives in Use”**, clearly list and describe the meaning of the audible blast warning and all-clear signals in use, and explain the identification of blasting areas where charged holes await firing at the blasting site in the mine permit area.

Warning and all-clear signals of different character or pattern that are audible within a range of one-half mile from the point of the blast will be given. Each person within the permit area and each person who resides or works regularly within one-half mile of the blast site in the mine permit area will be notified of the meaning of the signals in the blasting schedule and notification.

Access within the blasting areas will be controlled to prevent presence of livestock or unauthorized persons during blasting and until an authorized representative of Alton Coal Development LLC has reasonably determined that no unusual hazards exist, such as imminent slides or un-detonated charges; and access to and travel within the blasting area can be safely resumed.

524.600 - 610 Adverse Effects Of Blasting

Blasting will be conducted to prevent injury to persons, damage to public or private property outside the mine permit area, and changes in the course, channels, or availability of surface or ground water outside the mine permit area.

524.620 Airblast Limits

Airblast will not exceed the maximum limits listed below at the location of any dwelling, public building, school, church, or community or institutional building outside the mine permit area, except for those structures and facilities owned by Alton Coal Development LLC as approved by the Division. Maximum airblast limits are as follows:

Lower Frequency Limit of Measuring System, HZ (+3dB)	Maximum Level dB
0.1 Hz or lower – flat response ⁽¹⁾	134 peak
2 Hz or lower – flat response	133 peak
6 Hz or lower – flat response	129 peak
C-weighted – slow response ⁽¹⁾	105 peak dBC

(1) Only when approved by the Division.

524.630. Monitoring:

Periodic monitoring will be conducted to ensure compliance with the airblast standards. Airblast measurements will be taken as required by the Division at locations specified by the Division. The measuring system used will have an upper-end flat frequency response of at least 200 Hz.

524.633. Flyrock:

Flyrock traveling in the air or along the ground will not be cast from the blasting site more than one-half the distance to the nearest dwelling or other occupied structure; beyond the area of blasting access control or beyond the mine permit area boundary.

524.640 - 662. Ground Vibration.

In all blasting operations, except as otherwise authorized by the Division, the maximum ground vibration will not exceed the values approved by the Division. The maximum ground vibration for protected structures will be in accordance with either the maximum peak-particle velocity limits, the scaled-distance equation, the blasting-level chart, or by the Division. All other structures in the vicinity of the blasting area such as water towers, pipelines and other utilities, tunnels, dams, impoundments, and underground mines will be protected from damage by establishment of a maximum allowable limit on the ground vibration. These limits will be submitted by Alton Coal Development LLC and approved by the Division prior to blasting. A seismographic record will be provided for each blast.

Maximum Peak-Particle Velocity Method: The maximum ground vibration will not exceed the following limits at the location of any dwelling, public building, school, church, or community or institutional building outside the mine permit area in accordance with the following:

Distance (D) from Blast Site in feet	Maximum allowable Particle Velocity (Vmax) for ground vibration, in inches/second ⁽¹⁾	Scaled distance factor to be applied without seismic monitoring (Ds) ⁽²⁾
0 to 300	1.25	50
301 to 5,000	1.00	55
5,001 and beyond	0.75	65

- (1) Ground vibration will be measured as the particle velocity. Particle velocity will be recorded in three mutually perpendicular directions. The maximum allowable peak particle velocity will apply to each of the three measurements.
- (2) Applicable in the scale-distance equation of 524.651.

Scaled Distance Equation Method: Alton Coal Development LLC will use the scaled-distance equation, $W=(D/Ds)^2$, to determine the allowable charge weight of explosives to be detonated in any eight-millisecond period, without seismic monitoring: where W = the maximum weight of explosives, in pounds: D = the distance, in feet, from the blasting site to the nearest protected structure: and Ds = the scaled-distance factor, which may initially be approved by the Division using the values for scaled-distance factor listed in 524.642.

The development of a modified scaled-distance factor may be authorized by the Division on receipt of a written request by Alton Coal Development LLC, supported by seismographic records of blasting at the mine site. The modified scaled-distance factor of the predicted ground vibration will not exceed the prescribed maximum allowable peak particle velocity of 524.642 at a 95% confidence level.

Blasting-Level-Chart. Alton Coal Development LLC may use the ground-vibration limits in Figure 1 (Figure 1, showing maximum allowable ground particle velocity at specified frequencies, is incorporated by reference. Figure 1 may be viewed at 30 CFR 817.67 or at the Division of Oil, Gas and Mining State Office.) to determine the maximum allowable ground vibration. If the Figure 1 limits are used, a seismographic record including both particle velocity and vibration-frequency levels will be provided for each blast. The method for the analysis of the predominant frequency contained in the blasting records will be approved by the Division before application of this alternative blasting criterion.

524.690. Standards not Applicable

The maximum airblast and ground-vibration standards of 524.620 through 524.632 and 524.640 through 524.680 will not apply at the following locations: At structures owned by Alton Coal Development LLC and not leased to another person; and at structures owned by Alton Coal Development LLC and leased to another person, if a written waiver by the lessee is submitted to the Division before blasting.

524.700 Records of Blasting Operations:

Blasting records will be maintained at the mine site for at least three years and upon request, records will be available for inspection by the Division or the public. A blasting record will contain the name of Alton Coal Development LLC; location, date, and time of the blast; name, signature, and Utah certification number of the blaster conducting the blast. It will also include the identification, direction, and distance, in feet, from the nearest blast hole to the nearest dwelling, public building, school, church, community or institutional building outside the permit area, except those described in 524.690 and weather conditions, including those which may cause possible adverse blasting effects.

The blasting record will include: The type of material blasted; sketches of the blast pattern including number of holes, burden, spacing, decks, and delay pattern; diameter and depth of holes; types of explosives used; total weight of explosives detonated in an eight-millisecond period; initiation system; type and length of stemming; and mats or other protection used.

If required, a record of seismographic and airblast information will include: type of instrument, sensitivity, and calibration signal or certification of annual calibration; exact location of instrument and the date, time, and distance from the blast; name of the person and firm analyzing the seismographic record; and the vibration and/or airblast level recorded; and the reasons and conditions for each unscheduled blast.

524.800 Use of Explosives:

Alton Coal Development LLC will comply with all appropriate Utah and federal laws and regulations in the use of explosives.

525. SUBSIDENCE CONTROL PLAN

Not applicable

526. MINE FACILITIES:

526.110-115 Existing Structures.

There are no existing structures within the permit area.

526.116. Public Roads:

526.116.1. Operations Within 100 ft. of a Public Road

Initial mining operations at the Coal Hollow Mine will be on the western edge of the property, and will require rerouting Kane County Road #136 so that operations do not come within 100 feet of this road. During the initial development phase (topsoil

removal, diversion construction, etc.), equipment traffic may cross the county road right-of-way to access the necessary area. see Drawing 5-3.

526.116.2 Relocating a Public Road:

Following the initial development period, Alton Coal Development LLC will relocate Kane County Road #136 to a route that bypasses the permit area. The right-of-way of this relocated road will not be within 100 ft. of any mining operation. The design and route of the relocated road will be approved by Kane County authorities, or such other authorities as have jurisdiction. The current road will be barricaded to prevent entrance, and appropriate signs installed to protect the public. The proposed relocation of Kane County Road #136 is shown on Drawing 5-3.

526.200 Utility Installation and Support Facilities

526.210 Existing Utilities.

There are no known oil, gas, and water wells; oil, gas, and coal-slurry pipelines, railroads; electric and telephone lines; and water and sewage lines passing over, under, or through the permit area. Should such facilities be installed, mining and reclamation operations will be conducted in a manner that minimizes damage, destruction, or disruption of services provided by such facilities unless otherwise approved by the owner of those facilities and the Division.

526.220 Support Facilities

The mine support facilities will include an office, shop, wash bay, oil containment, fuel containment, coal stacking system, and a coal loadout system. These facilities will be constructed on an isolated section of the permit area that is approximately 29 acres. This area is located immediately north of Lower Robinson Creek, in Township 39 South, Range 5 West, Section 19. A diversion ditch will route water from the upgradient area immediately east of the area around the facilities and into a tributary of Lower Robinson Creek as shown on Drawing 5-3. Storm water and snow melt that occurs within the facilities area will be routed to an impoundment that will contain sediment. This impoundment will have a drop-pipe spillway installed that will allow removal of any oil sheens that may result from parking lots or maintenance activities by using absorbent materials to remove the sheen. Details for this impoundment can be viewed on Drawings 5-28.

The following is a detailed description of each proposed facility and a reference to where detailed drawings can be found:

- Office: The office will be located on the northwest corner of the facilities area, immediately adjacent to the facilities access road. This building will be a steel structure with concrete footers. This structure will be 150 feet long by 100 feet wide and will be two stories in height. The office will provide working space for

administrative and technical personnel. Details for the office can be viewed of Drawings 5-3 and 5-6.

- Shop: The shop will be located on the northeast side of the facilities area. This building will be a steel structure with concrete floors and foundation. The structure will be approximately 200 feet long by 100 feet wide and 50 feet high. This building will be used for maintenance of equipment, parts storage, tool storage, and office space for maintenance personnel. Details for this building can be viewed on Drawings 5-3 and 5-7.
- Wash Bay: The wash bay will be located immediately east of the shop. This building will be a steel structure with a concrete foundation. The structure will be 50 feet long by 60 feet wide and 50 feet high. Included will be a closed circuit water recycle system. This system will eliminate and store water impurities and reroute water back through the wash bay for cleaning equipment. Details for this structure can be viewed on Drawings 5-3, 5-8, and Appendix A5-4.
- Oil and Fuel Containments: The oil and fuel containments will be concrete structures appropriately sized for containing metal tanks. The oil containment will contain 55 gallon barrels and up to 2,000 gallon totes. This containment will be 80 feet long by 30 feet wide and 3 feet deep. The fuel containment will store 3 fuel tanks. Included will be a 4,000 gallon unleaded fuel tank and two 12,000 gallon diesel tanks. This structure will 50 feet long by 30 feet wide and 3 feet deep. Details for this structure can be viewed on Drawings 5-3 and 5-8.
- Coal Stacking System: The coal stacking system will be located in the central part of the facilities area. This system will include a coal hopper, coal feeder breaker, feed conveyor, crusher, and an inclined conveyor belt. Trucks will dump coal into the coal hopper which will funnel coal through the feeder breaker onto a short feed conveyor belt. This conveyor belt will transport the coal approximately 253 feet to a crusher that will size the coal appropriately for market. Once the coal is sized through the crusher it will enter an inclined stacker conveyor belt that is angled at approximately 16 degrees and is 322 feet long. This system will be a radial conveyor which will feed a coal stock pile with a live storage of approximately 150,000 tons. This system can be viewed on Drawings 5-3 through 5-5.
- Coal Loadout System: The coal loadout system will be located in the central part of the facilities area. This system will include feeder chutes, a coal reclaim conveyor and an inclined conveyor. The feeder chutes will be located beneath the coal stockpile and provide a method for loading the coal onto the reclaim conveyor. The coal reclaim system includes two sections of conveyor. One conveyor is approximately 480 feet in length and the other is 260 feet. These conveyor sections feed an inclined belt that puts coal into the loadout hopper. This loadout hopper will load highway approved haul trucks that transport coal to market.

During mine development and the initial mining period, some facilities of a temporary nature such as mobile buildings and crusher/stacking conveyors may be utilized.

The support facilities will be located, maintained, and used in a manner that prevent or control erosion and siltation, water pollution, and damage to public or private property; and to the extent possible use the best technology currently available to minimize damage

to fish, wildlife, and related environmental values; and minimize additional contributions of suspended solids to stream flow or runoff outside the mine permit area. Any such contributions will not be in excess of limitations of Utah or Federal law.

The facilities will be fully reclaimed at the end of mining operations. The final contour for this area can be viewed on Drawing 5-35.

526.300 Water Pollution Control Facilities:

Water pollution associated with mining and reclamation activities within the permit areas will be controlled by:

- Construction of berms and/or diversion ditches to control runoff from all facilities areas.
- Roads will be constructed with ditches to capture runoff
- Diversion ditches will be constructed as necessary around active mining and reclamation areas to capture runoff from those areas.
- Sedimentation impoundments will be constructed to control discharges
- In areas where impoundments or diversions are not suitable to the surrounding terrain, silt fence or straw bales will be utilized to control sediment discharge from the permit area.

In order to accomplish these objectives, watershed analysis of the permit and adjacent areas has been completed and specific designs are established for each water pollution control structure. Primary control structures include four sediment impoundments, four diversion ditches and miscellaneous berms. The locations of these structures can be viewed on Drawing 5-3. The detailed analysis for these structures and specific designs can be viewed on Drawings 5-25 through 5-34. In addition, a geotechnical analysis of the impoundments to ensure stability can be viewed in Appendix A5-1. The watershed and structure sizing analysis can be viewed in Appendix A5-2.

In addition to these primary structures, temporary diversions and impoundments may also be implemented, as necessary, in mining areas to further enhance pollution controls.

All these facilities will be reclaimed to approximate original contour. The reclamation sequence and final landform can be viewed on Drawings 5-35 and 5-38.

526.400 Air Pollution Control Facilities:

Air pollution (fugitive dust) emissions from mining and reclamation operations in the permit area will be controlled by a number of means, including:

- Haul roads will be maintained and will have water or other dust suppressants applied as appropriate.
- Road surfaces will be graded to stabilize/remove dust-forming debris as required.
- Areas adjoining primary roads will be stabilized and vegetated as required.

- Mobile equipment speeds will be controlled to minimize dusting conditions.
- Cleared vegetation debris within the mine area will be disposed of by placement in pit backfills.

For details related to air pollution control and monitoring, refer to Chapter 4 and Appendix 4-2.

527. TRANSPORTATION FACILITIES

527.100 Classification of Roads

All roads used for transporting coal or spoil outside the active mining area are classified as primary roads and all other roads outside the active mining area are classified as ancillary roads; see Drawing 5-3 for location of Primary Roads.

527.200 Description of Roads

Transportation facilities for the Coal Hollow Mine include two primary haul roads, a conveyor system, and miscellaneous ancillary/temporary roads. Numerous drawings detail the designs and specifications for each one of the proposed facility. The following is a description of each facility and a reference to the associated drawings:

- Roads: Two primary haul roads are planned within the permit area. The first road extends from the coal unloading area to the first series of pits along the west side of the property. This road will be utilized for access to pits 1 through 15 (pits shown on Drawing 5-10). This road will be approximately 2,600 feet in length and will be utilized mainly during the first two years of mining. There will be three culverts installed along this road all sized for a 100 year, 24 hour storm event. The first culvert will be across a tributary of Lower Robinson Creek and will be a 36 inch corrugated steel pipe. The second culvert is the main crossing over Lower Robinson Creek and is a 96 inch corrugated steel pipe. Both of these culverts have been sized based on analysis of the Lower Robinson Creek watershed. This analysis can be viewed in Appendix A5-1. The third culvert is crossing over a diversion ditch that will route water mainly from disturbed areas along the south side of Lower Robinson Creek to a sediment impoundment. This culvert will be a 24 inch corrugated steel pipe appropriately sized for the maximum flows expected in the diversion.

The second road extends from an intersection with the first road, located just south of the Lower Robinson Creek crossing, and proceeds south to approximately pit 25. This road is approximately 2,500 feet in length and will be used for the south pits 16 through 30. There is one culvert crossing along this road to cross a diversion ditch. This culvert will be a 24 inch culvert sized for maximum anticipated flows in the diversion.

The following specifications apply to these Primary roads:

- 1) Roads will be approximately 80' in width
- 2) Approximately a 2% crown

- 3) Approximately one foot deep cut ditches along shoulders for controlling storm water
- 4) 18" of crushed rock or gravel for road surfacing
- 5) Cut and fill slopes of 1.5 h:1v
- 6) Minimum fill over each culvert will be 2 times diameter of culvert
- 7) Berms placed as necessary along fills

The ancillary roads will have similar specifications except surfacing will occur only as needed and the roads may be narrowed to a 40 foot road width.

The location and details for all these roads can be viewed on Drawings 5-3 and 5-22 through 5-24.

The ramps, benches and equipment travel paths within the active surface mining area are temporary in nature and will be relocated frequently as mining progresses. These temporary travelways are considered part of the pit due to their short term use, and are not individually designed nor engineered. They will be built and maintained to facilitate safe and efficient mine and reclamation operations.

- **Conveyors:** A conveyor system will be used to stockpile coal and to load highway approved haul trucks for transportation to market. The first conveyor is mainly a stacker system for the coal stockpile which will be located at the coal unloading area and will be approximately 575' in length. This conveyor is estimated to be a 54" solid frame system.

The second conveyor is a coal reclaim belt that will be loaded from chutes beneath the coal stockpile and will convey coal to the loadout chute which will load the highway approved coal haulage trucks. This section will be approximately 222' in length. Similar to the first section, this conveyor is estimated to be a 54" solid frame system.

Drawings of this system can be viewed on Drawings 5-3 through 5-5.

The ramps, benches and equipment travel paths within the active surface mining area are temporary in nature and will be relocated frequently as mining progresses. These temporary travelways are considered part of the pit due to their short term use, and are not individually designed nor engineered. They will be built and maintained to facilitate safe and efficient mine and reclamation operations.

527.220 Alteration or Relocation of Natural Drainageways.

As currently planned, no natural drainageways will be altered or relocated due to road construction. If such alterations or relocations are necessary, appropriate measures will be taken to obtain Division approval for such alterations or relocations.

Mine development work will include a permanent diversion of Lower Robinson Creek away from the mining area. This diversion has been designed for a flow capacity of a 100 year, 24 hour storm event. The sides will be graded to a 3h:1v slope and rip-rap will be appropriately placed to minimize erosion of the channel beyond current channel conditions. All specifications required to meet the requirements for such a diversion have been included in this diversion design with the exception of R645-301-742.322. R645-301-742.322 specifies that the design capacity of the diversion be at minimum the capacity of the natural channel immediately above and below the diversion. Due to the excessive erosion that has occurred in the natural channel, this diversion is not designed to this excess capacity and instead is designed beyond the capacity standard set forth in R645-301-742.323 (100 year, 6 hour). Appendix A5-2 details the analysis/specifications for this diversion and Drawings 5-20 and 5-21 show the details of this design.

527.230 Road Maintenance

All roads will be maintained on an as needed basis using motor graders, water trucks for dust suppression, and other equipment as necessary. Crushed stone and/or gravel will be used as a surface course for primary roads outside the active mining area, and may be used as needed for ramps and travelways within the pit. Should the roads be damaged by a catastrophic event, such as an earthquake or a flood, repairs will be made as soon as possible after the damage has occurred or the road will be closed and reclaimed.

527.250. Geotechnical Analysis

No alternative specifications or steep cut slopes associated with roads are anticipated outside the active mine area. A report of appropriate geotechnical analysis will be provided should such alternative specifications or steep cut slopes where approval of the Division is required, become necessary.

528. HANDLING AND DISPOSAL OF COAL, OVERBURDEN, EXCESS SPOIL, AND COAL MINE WASTE:

528.100. Coal removal, handling, storage, cleaning, and transportation areas and structures;

Coal handling activities are confined to the active pit, and the coal sizing/loading areas located north of the pit. All areas and facilities will be designed and constructed, utilized and maintained in conformance with industry standards and all applicable regulations. At the conclusion of mining, the facilities will be removed as part of final mine reclamation activities. Material from coal stockpile areas, and other areas of potential coal accumulation will be excavated and the excavated material placed in the final mined out pit.

528.200. Overburden:

Overburden will be excavated after the removal of topsoil and subsoil as defined in Chapter 2. The overburden excavation will be accomplished by utilizing hydraulic excavators with end dump haul trucks and dozers. This process will include excavating this material in a stairstep fashion that will include benches approximately every 40 feet in depth. These benches are planned to be approximately 40 feet in width and will create an overall 2h:1v slope for the highwalls to create a stable and safe working area. This a conservative approach for initial mining and once mining begins, ongoing geotechnical studies and monitoring will be used to further define the proper slope angle to ensure slope stability while maximizing resource recovery.

Based on the overburden isopach map (Drawing 5-15), the overburden removal has been separated into three major stages. The first stage of overburden removal is the initial mining area, Pits 1-8. These pits have a relatively low strip ratio, approximately 5:1 (refer to Drawing 5-13). In order to efficiently remove overburden for this phase, spoil from the first three pits will be placed in an excess spoil area. This excess spoil structure will hold approximately 2.7 million loose cubic yards (LCY) of material. Once the excess spoil pile is filled, overburden from Pits 4 through 8 can then be used as pit backfill as the mining progresses through Pit 8. The completion of this phase is shown on Drawing 5-17.

As mining progresses through Pits 9-15, the isopach (Drawing 5-15) shows that the overburden significantly increases. This increase and the shape of the mining boundary for the Permit Area requires a fill above approximate original contour. Material from Pits 9-15 significantly exceeds the backfill capacity available from the preceding pits (Pits 1-8). The fill above approximate original contour blends in with the excess spoil structure from Stage 1 and extends an additional 2,500 feet to the east as the mining sequence proceeds to Pit 15. In this stage, the fill above original contour is approximately 5.8 million LCY. Drawing 5-18 (Stage 2) shows the details of this stage of the overburden removal and resulting landform.

Stage 3 overburden removal begins in Pit 16 and proceeds through Pit 30. During this stage, the strip ratio reduces significantly from Stage 2 as mining progresses to the south end of the property. As the strip ratio reduces to the south, significant backfill capacity is available in the preceding pits. This results in the distance between the backfill and the active coal face increasing. At the end of mining, an area will not be completely backfilled that is approximately 2,000 feet in length and 1,300 feet wide and will require 6.8 million yards of fill to complete reclamation to approximate original contour. The backfill configuration at the end of this stage is shown in Drawing 5-19.

The proposed plan for backfilling these final pits includes acquiring the right to mine the adjacent federal coal reserves, located immediately west of this area. This plan provides an efficient method for transitioning operations into the federal reserves. At the time that this transition occurs, overburden will be removed from the federal reserves and placed in

the final pits to approximate original contour. This final landform can be viewed on Drawing 5-35 and 5-36.

In the case that Alton Coal Development is not successful with acquiring the adjacent federal coal reserves, all the fill above approximate original contour and part of the excess spoil structure will be rehandled and placed back in the remaining backfill area. The final landform for this scenario is shown on Drawing 5-37. This step requires rehandle of approximately 6.8 million yards of spoil.

The following tables show the material balance during the different phases of overburden removal for each scenario:

Preferred Scenario (Adjacent Federal Reserves Acquired)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	7,945,000	5,204,000	2,741,000	2,741,000
2	15,145,000	9,303,000	5,842,000	8,583,000
3	15,447,000	22,247,000	0	8,583,000
4 (Federal)	6,800,000	6,800,000	0	8,583,000
Total	45,337,000	36,754,000	8,583,000	8,583,000

*Loose Cubic Yards is estimated based on an overall 22% swell factor (Caterpillar Performance Handbook)

Alternate Scenario (Adjacent Federal Reserves Not Acquired)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	7,945,000	5,204,000	2,741,000	2,741,000
2	15,145,000	9,303,000	5,842,000	8,583,000
3	15,447,000	22,247,000	0	8,583,000
4 (Rehandle)	0	6,800,000	-6,800,000	1,783,000
Total	38,537,000	36,754,000	1,783,000	1,783,000

*Loose Cubic Yards is estimated based on an overall 22% swell factor (Caterpillar Performance Handbook)

The Preferred scenario for overburden removal will minimize overall disturbance and maximize resource recovery by providing a transition into the adjacent federal reserves with minimal effect to existing reclamation and backfill in the Permit Area. This scenario will also minimize variances from approximate original contour on the federal lands by eliminating the need for an excess spoil structure from the initial boxcut once operations are transitioned into these reserves.

During the course of mining, some additional excavated overburden may be placed temporarily on mined over and backfilled areas due to operational considerations. This material will be re-excavated and moved to it's final placement location as operations allow.

All maps related to the overburden removal process can be viewed on Drawings 5-15 through 5-19.

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

Not Applicable.

528.310. Excess Spoil. Excess spoil will be placed in designated disposal areas within the permit areas, in a controllable manner to ensure mass stability and prevent mass movement during and after construction. Excess spoil will meet the design criteria of R645-301-535. For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, the permit application must include a description of the proposed disposal site and the design of the spoil disposal structures according to R645-301-211, R645-301-212, R645-301-412.300, R645-301-512.210, R645-528.310, R645-301-535.100 through R645-301-535.130, R645-301-535.300 through R645-301-535.500, R645-536.300, R645-301-542.720, R645-301-553.240, R645-301-745.100, R645-301-745.100, R645-301-745.300, and R645-301-745.400.

Excess spoil will be placed in the area designated on Drawing 5-3 and 5-35. This fill will be placed in lifts not to exceed 4 feet in thickness. The material will be transported from the overburden removal area to the fill by end dump haul trucks and a dozer(s) will spread the spoil to this lift thickness. The fill will meet at minimum 90% compaction as related to the standard Procter. Final slopes will be regraded to a maximum slope of 3h:1v. The top of the fill will be sloped to approximately 2% to prevent pooling of water and to reestablish drainage similar to original flow patterns. The excess spoil placed on the non-mined areas is approximately 32 acres and varies in height from 35 to 110 feet. The area of excess fill over mined out areas (variance from approximate original contour) is an extension of the fill placed on the non-mined area and is approximately 55 acres. Combined acreage of the excess fill placed on mined and non-mined areas is 87 acres and varies in height from 60 to 100 feet above original contour. Total excess fill is 8.6 million yards. Design of this fill can be viewed in Drawings 5-35 through 5-36 and the geotechnical study can be viewed in Appendix A5-1.

- *R645-301-211: The applicant will present a description of the premining soil resources as specified under R645-301-221. Topsoil and subsoil to be saved under R645-301-232 will be separately removed and segregated from other material.*

The soil resources for the proposed excess spoil disposal area are described in A2-1. A plan has been developed for removal of topsoil and suitable subsoil based on the soil descriptions in this appendices. The handling plan can be viewed on Drawing 2-2. Topsoil and acceptable subsoil will be separately removed and segregated from other material prior to placement of any spoil.

- *R645-301-212: After removal, topsoil will be immediately redistributed in accordance with R645-301-242, stockpiled pending redistribution under R645-301-234, or if demonstrated that an alternative procedure will provide equal or more protection for the topsoil, the Division may, on a case-by case basis, approve an alternative;*

Excess spoil will have topsoil and subsoil redistributed in an approximately uniform, stable thickness with the approved post mining land use, contours and surface water drainage systems. Material handling practices will prevent excess compaction of these materials. Handling practices will also protect the materials from wind and water erosion before and after seeding and planting. These practices include seeding and grading stockpiles that will exist for more than year to stabilize the soil.

- *R645-301-412.300: Criteria for Alternative Postmining Land Uses.*

Not Applicable

- *R645-301-512.210: Excess Spoil. The professional engineer experienced in the design of earth and rock fills will certify the design according to R645-301-535.100.*

A professional engineer experienced in the design of earth and rock fills with assistance from a geotechnical expert has certified the design according to R645-301-535.100. These certifications can be viewed on Drawings 5-35, 5-36 and 5-17 through 5-19.

- *R645-301-512.220: Durable Rock Fills*

No durable rock fills are planned.

- *R645-301-514.100: Excess Spoil. The professional engineer or specialist will be experienced in the construction of earth and rock fills and will periodically inspect the fill during construction. Regular inspections will also be conducted during placement and compaction of fill materials.*

A professional engineer or specialist that is experienced in the construction of earth and rock fills will inspect the fill during construction and regular inspections will also be conducted during placement and compaction of fill materials.

- *R645-301-535.100 through R645-301-130: Disposal of Excess Spoil*

A geotechnical analysis of the excess spoil structure design has been completed by an expert in this field. The long term static safety factor for this structure design is estimated at 1.7 to 1.8. Lifts will be placed in thicknesses not to exceed 4 feet. The lifts will meet 90% compaction by the standard Procter. The fill will

be graded to allow for drainage similar to original patterns and to prevent excessive infiltration of water. Fill will be covered with subsoil and topsoil as specified in Chapter 2 to provide conditions suitable for revegetation of the area. The geotechnical study can be viewed in Appendix A5-1.

- *R645-301-535.300 through R645-301-535.500: Disposal of Excess - Spoil Durable Rock Fills.*

Not Applicable

- *R645-301-536.300: Disposal of Coal Mine Waste in Excess Spoil*

No coal mine waste is planned in the excess spoil area.

- *R645-301-542.720: Excess spoil will be placed in designated disposal areas within the permit area, in a controlled manner to ensure that the final fill is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use. Excess spoil that is combustible will be adequately covered with noncombustible material to prevent sustained combustion. The reclamation of excess spoil will comply with the design criteria under R645-301-553.240.*

The excess spoil as shown in Drawing 5-35 and 5-36 will be suitable to the surrounding area and for the postmining land use of primarily grazing. No combustible excess spoil will be placed in the proposed structure. The final reclamation of the spoil does not include any terraces and the slopes will not exceed 3h:1v.

- *R645-301-553.240: The final fill configuration of the fill (excess spoil) will be suitable for the approved postmining land use. Terraces may be constructed on the outslope of the fill if required for stability, control of erosion, to conserve soil moisture, or to facilitate the approved postmining land use. The grade of the outslope between terrace benches will not be steeper than 2h:1v (50 percent).*

The excess spoil as shown in Drawings 5-35 and 5-36 will be suitable to the surrounding area and for the postmining land use of primarily grazing. The reclamation of the spoil does not include any terraces and the slopes will not exceed 3h:1v. The long term static safety factor for these slopes is estimated to be 1.7 to 1.8.

- *R645-301-745.100: General Requirements.*

745.110: Excess Spoil will be placed in designated disposal areas within the permit area, in a controlled manner to:

745.111: Minimize the adverse effects of leaching and surface water runoff from the fill on surface and underground water;

Reclamation of the excess spoil will include a topsoil cover and subsoil layer. Infiltration through the reclamation is expected to be minimal based on the high clay content of these soils. In addition, laboratory data for the overburden shows that there is minimal potential for leaching of pollutants should infiltration rates become higher than expected.

The foundation of the excess spoil area also has high clay content with minimal potential for infiltration. This will provide an additional, natural barrier to protect ground water present beneath the proposed structure.

745.112: Ensure permanent impoundments are not located on the completed fill. Small depressions may be allowed by the Division if they are needed to retain moisture or minimize erosion, create and enhance wildlife habitat or assist revegetation, and if they are not incompatible with the stability of the fill; and

Permanent impoundments are not planned on the excess spoil area. Small depressions may be constructed as allowed by the Division to retain moisture, minimize erosion, create and enhance wildlife habitat or assist revegetation.

745.113: Adequately cover or treat the excess spoil that is acid- and toxic forming with nonacid nontoxic material to control the impact on the surface and ground water in accordance with R645-301-731.300 and to minimize adverse effects on plant growth and approved postmining land use.

Laboratory data representative of the overburden planned for disposal in the excess spoil area does not show acid- and toxic forming characteristics.

745.120: Drainage Control. If the disposal area contains springs, natural or manmade water courses, or wet weather seeps, the fill design will include diversions and underdrains as necessary to control erosion, prevent water infiltration into the fill and ensure stability.

A spring and seep survey available in Chapter 7 has identified no springs or wet weather seeps in the proposed excess spoil area. The final surface will be regraded to a contour that will route water from snowmelt and rainfall around the excess spoil as shown on the final contours Drawing 5-35. There are no manmade water courses present in the excess spoil area. No underdrains are planned for the excess spoil structure.

745.121: Diversions will comply with the requirements of R645-301-742.300

No diversions are planned in the excess spoil area.

745.122 : Underdrains

No underdrains are planned in the excess spoil area.

745.300: Durable Rock Fills

Not Applicable

745.400: Preexisting Benches

Not Applicable

528.320. Coal Mine Waste.

Not Applicable

528.322. Refuse Piles.

Not Applicable

528.323. Burning and Burned Waste Utilization.

Not Applicable

528.330. Noncoal Mine Waste.

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 temporarily stored in appropriate containers and removed from the permit area and will be properly disposed of according to applicable State and Federal regulations.

528.332.

Final disposal of noncoal mine wastes will be in a State-approved solid waste disposal site not located within the permit area.

528.333.

At no time will any noncoal mine waste be deposited in a refuse pile or impounding structure, nor will any excavation for a noncoal mine waste disposal site be located within eight feet of any coal outcrop or coal storage area.

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.

528.340. Underground Development Waste.

Not Applicable

528.350. Acid-Forming and Toxic Materials

Debris, acid-forming, toxic-forming materials and materials constituting a fire hazard will be identified and 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. Appropriate measures will be implemented to preclude sustained combustion of such materials; and

528.400. Dams, embankments and other impoundments.

Plans do not include using dams, embankments or other impoundments for disposal of coal, overburden, excess spoil or coal mine waste

529. **MANAGEMENT OF MINE OPENINGS.**

All wells will be managed to comply with R645-301-748 and R645-301-765. Water monitoring wells will be managed on a temporary basis according to R645-301-738.

Wells constructed for monitoring groundwater conditions in the proposed Coal Hollow Mine permit and adjacent area, including exploration holes and boreholes used for water wells or monitoring wells, will be designed to prevent contamination of groundwater and surface-water resources and to protect the hydrologic balance. A diagram depicting typical monitoring well construction methods is shown in Drawing 7-11. Monitoring wells will include a protective hydraulic seal immediately above the screened interval, an annular seal plugging the borehole above the hydraulic seal to near the ground surface, and a concrete surface seal extending from the top of the hydraulic seal to the ground surface which is sloped away from the well casing to prevent the entrance of surface flows into the borehole area. Well casings will protrude above the ground surface a sufficient height so as to minimize the potential for the entrance of surface water or other material into the well. A steel surface protector with a locking cover will be installed at

monitoring wells to prevent access by unauthorized personnel. Where there is potential for damage to monitoring wells, the wells will be protected through the use of barricades, fences, or other protective devices. These protective devices will be periodically inspected and maintained in good operating conditions. Monitoring wells will be locked in a closed position between uses.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of “Administrative Rules for Water Well Drillers”, State of Utah, Division of Water Rights or other applicable state regulations. Abandonment of wells will be performed by a licensed water well driller. The wells to be abandoned will be completely filled using neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout, or other materials approved by the Utah State Engineer’s office. Alternatively, the well may be abandoned using a different procedure upon approval from the Utah State Engineer’s office.

Abandonment materials will be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the State Engineer by the responsible licensed driller giving data related to the abandonment of the well. This shall include the name of the licensed driller or other person(s) performing abandonment procedures, name of well owner at the time of abandonment, the address or location of the well by section, township, and range, abandonment materials and equipment used, water right or file number covering the well, the final disposition of the well, and the date of completion.

Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to minimize disturbance to the prevailing hydrologic balance. Exploration holes and boreholes will be managed to ensure the safety of people, livestock, fish and wildlife, and machinery.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

If any exploration boreholes are to be used as monitoring wells or water wells, these will meet the provisions of R645-301-731

Boreholes will be backfilled to within 1 foot of the land surface with concrete or other materials approved by the Division as necessary to prevent contamination of groundwater or surface-water resources or to protect the prevailing hydrologic balance. The upper approximately 1 foot will be backfilled with native materials to facilitate reclamation (see Drawing 6-11). Exploration holes and boreholes that may be uncovered during mining and reclamation activities will be permanently closed unless approved for water monitoring or otherwise managed in a manner approved by the Division.

530 OPERATIONAL DESIGN CRITERIA AND PLANS:

531 GENERAL:

There are four sediment impoundments proposed for the permit area. These structures will be constructed using a combination of dozers and backhoes. The structures have been designed to contain the required storm events as specified in Appendix A5-2. The structures will have sediment removed as necessary to ensure the required capacities. Details for these structures can be viewed on Drawings 5-25, 5-26 and 5-28 through 5-32. Calculations and supporting text can be viewed in Appendix A5-2.

There are no other coal processing waste banks, dams or embankments proposed within the permit area.

Underground mining has not occurred within the permit area.

532 SEDIMENT CONTROL:

Four diversion ditches along with four sediment impoundments are proposed for the permit area. In addition, miscellaneous controls such as silt fence and berms are also proposed for specific areas. The proposed locations for these structures are shown on Drawing 5-3. Details associated with these structures can be viewed on Drawings 5-25 through 5-34 and Appendix A5-2.

Mulch will be placed on the seedbed surface once soil amendments have been incorporated and seeding has been accomplished in areas that will be reclaimed to native plant communities (areas used for pasture lands will not be mulched). The mulch should control erosion by wind and water, decrease evaporation and seed predation, and increase survivability of the seeded species. Like the seeding methods, mulch will be applied with a variety of techniques and materials depending on the reclaimed area.

532.100 Disturbed Area:

The smallest practicable area, consistent with reasonable and safe mine operational practices will be disturbed at any one time during the mining operation and reclamation phases. This will be accomplished through progressive backfilling, grading, and prompt revegetation of disturbed areas. An estimated reclamation schedule is shown on Drawing 5-38.

532.200 Backfill Stabilization:

The backfilled material will be stabilized by grading to promote a reduction of the rate and volume of runoff in accordance with the applicable requirements. The excess spoil and fill above approximate original contour will be graded to a 3h:1v slope and revegetated to minimize erosion. A geotechnical analysis of this configuration has been completed and the factor of safety is estimated at 1.7 to 1.8. This analysis can be viewed in Appendix A5-1. The remaining backfill will be placed in the mined out pit, and thus confined on all sides. The backfill will be inherently stable.

Mulch will be placed on the seedbed surface once soil amendments have been incorporated and seeding has been accomplished in areas that will be reclaimed to native plant communities (areas used for pasture lands will not be mulched). The mulch should control erosion by wind and water, decrease evaporation and seed predation, and increase survivability of the seeded species. Like the seeding methods, mulch will be applied with a variety of techniques and materials depending on the reclaimed area.

533. IMPOUNDMENTS.

533.100.

No impoundments meeting the NRCS Class B or C criteria for dams in TR-60, or the size or other criteria of 30 CFR Sec. 77.216(a) are planned for the Coal Hollow Mine.

533.110

Impoundments not included in 533.100, will be designed and constructed with a minimum static safety factor of 1.3 for a normal pool with steady state seepage saturation conditions or meet the requirements of R645-301-733.210.

The proposed sediment impoundments are expected to impound seasonal water and storms. A geotechnical analysis of these designs has been performed and can be reviewed in Appendix A5-1. Static safety factors for the proposed designs range from 2.1 to 3.8.

533.200. Foundations.

Foundations for temporary and permanent impoundments will be designed so that

- *Foundations and abutments for the impounding structure are stable during all phases of construction and operation. Such foundations for temporary and permanent impoundments will be designed based on adequate and accurate information on the foundation conditions*

Refer to Appendix A5-1 for information related to foundations of the proposed impounding structures. No permanent impoundments are proposed.

- *All vegetative and organic materials will be removed and foundations excavated and prepared to resist failure. Cutoff trenches will be installed if necessary to ensure stability.*

All vegetation, topsoil and subsoil as identified in Chapter 2 will be removed from the impoundment areas prior to construction. Cutoff trenches will not be necessary for stability.

- *Slope protection will be provided to protect against surface erosion at the site and protect against sudden drawdown.*

Slopes of impoundments will be seeded and sloped to protect against erosion at the site. The high clay content and compaction characteristics of the material present at the impoundments will also assist with minimizing erosion of the slopes.

- *Faces of embankments and surrounding areas will be vegetated except that faces where water is impounded may be riprapped or otherwise stabilized in accordance with accepted design practices.*

Faces of embankments will be vegetated to minimize erosion. Standing water in the ponds is expected to be minimal and therefore these faces will also be seeded for erosion control.

- *The vertical portion of any remaining highwall will be located far enough below the low- water line along the full extent of highwall to provide adequate safety and access for the proposed water users.*

All highwalls will be fully covered following active use and backfilling of pits.

533.600.

Not Applicable

533.610-620.

Not Applicable

533.700 - 714. Plans.

Each detailed design plan for structures not included in 533.610 shall:

- *Be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, except that all coal processing waste dams and embankments covered by R645-301-536 and R645-301- 746.200 shall be certified by a qualified, registered, professional engineer;*

Designs for the proposed impoundments have been prepared by a qualified, registered, professional engineer, with assistance from a geotechnical expert. These certifications can be viewed on Drawings 5-28 through 5-31.

- *Include any design and construction requirements for the structure, including any required geotechnical information;*

A geotechnical analysis of the impoundments has been prepared by an expert in this field. This analysis can be viewed in Appendix A5-1. Embankments will be constructed in 2 foot lifts as recommended by the analysis.

- *Describe the operation and maintenance requirements for each structure; and*

The proposed impoundments are designed to temporarily store water from storm events and snow melt. Long term standing water in the impoundments is anticipated to be seasonal and sediment will be removed as necessary to provide the required storage capacities. Emergency spillways have been included in the designs to provide a non-destructive discharge route should the capacities ever be exceeded. Surveys of these impoundments will be regularly conducted to ensure that design capacities are available.

- *Describe the timetable and plans to remove each structure, if appropriate.*

All impoundments will be reclaimed at the end of operations. The estimated timeline for removal of these structures are shown on Drawing 5-38. Expected removal is year four of the mining and reclamation process. In areas where soils are not stabilized following the removal of these sediment impoundments, silt fence will be appropriately installed and maintained to provide sediment control until stable conditions are met.

Detailed designs of impoundments can be viewed on Drawings 5-28 through 5-31. Locations can be viewed on Drawing 5-3 and 5-25.

534. **ROADS**

534.100-200 Roads will be located, designed, constructed, reconstructed, used, maintained, and reclaimed so as to:

- *Prevent or control damage to public or private property;*

All roads will be reclaimed to approximate original contour as shown on Drawings 5-35, 5-36 and 5-38. These roads are designed to control damage to public and private property.

- *Use nonacid - or nontoxic-forming substances in road surfacing; and*
There will be no acid or toxic forming substances used in road surfacing.
- *Have, at a minimum, a static safety factor of 1.3 for all embankments.*
All embankments are designed with static safety factors that exceed 1.3.
- *Have a schedule and plan to remove and reclaim each road that would not be retained under an approved postmining land use.*
All roads will be removed and reclaimed according to Drawings 5-35 and 5-36. The estimated timetable for removing these roads is shown on Drawing 5-38.
- *Control or prevent erosion, siltation and the air pollution attendant to erosion by vegetating or otherwise stabilizing all exposed surfaces in accordance with current, prudent engineering practices.*
Cut ditches will be established on the shoulders of all primary roads to control drainage and erosion. Cut and fill slopes along the primary roads will be minimal and are not expected to cause significant erosion. In locations where there are culvert crossings (i.e. Lower Robinson Creek), the fills slopes will be stabilized by utilizing standard methods such as grass matting or straw wattles.
- *To ensure environmental protection and safety appropriate for their planned duration and use, including consideration of the type and size of equipment used, the design and reconstruction of roads will incorporate appropriate limits for grade, width, surface materials, and any necessary design criteria established by the Division.*

The following specifications apply to these Primary roads:

- 1) Roads will be approximately 80' in width
- 2) Approximately a 2% crown
- 3) Approximately one foot deep cut ditches along shoulders for controlling storm water
- 4) 18" of crushed rock or gravel for road surfacing
- 5) Cut and fill slopes of 1.5 h:1v
- 6) Minimum fill over each culvert will be 2 times diameter of culvert
- 7) 6 foot berms placed as necessary along fills

The ancillary roads will have similar specifications except surfacing will occur only as needed and may be narrowed to a 40 foot road width.

The location and details for all these roads can be viewed on Drawings 5-3 and 5-22 through 5-24.

The ramps, benches and equipment travel paths within the active surface mining area are temporary in nature and will be relocated frequently as mining progresses. These temporary travelways are considered part of the pit due to their short term use, and are not individually designed nor engineered. They will be built and maintained to facilitate safe and efficient mine and reclamation operations.

534.300-340. Primary Roads.

Primary roads will:

- *Be located, insofar as practical, on the most stable available surfaces;*
These roads are designed on the most practicable, stable surfaces.
- *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;*

Primary roads will be surfaced with approximately 18” of crushed rock or gravel to provide a durable surface for the anticipated volume of traffic and equipment.

- *Be routinely maintained to include repairs to the road surface, blading, filling potholes and adding replacement gravel or asphalt. It will also include revegetation, brush removal, and minor reconstruction of road segments as necessary; and*

All roads will be maintained on an as needed basis using motor graders, water trucks for dust suppression, and other equipment as necessary. Crushed stone and/or gravel will be used as a surface course for primary roads outside the active mining area, and may be used as needed for ramps and travelways within the pit. Should the roads be damaged by a catastrophic event, such as an earthquake or a flood, repairs will be made as soon as possible after the damage has occurred or the road will be closed and reclaimed. Roads will be reclaimed once they are no longer needed for their intended use.

- *Have culverts that are designed, installed, and maintained to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road.*

Road fill over culverts will be at minimum two times the diameter of the culvert. This is a conservative standard that has been effectively utilized at mining operations with similar equipment and mining practices.

535. **SPOIL**

535.100 -150 Disposal of Excess Spoil. *Excess spoil will be placed in designated disposal areas within the permit area in a controlled manner. The fill and appurtenant structures will be designed using current, prudent engineering practices and will meet any design criteria established by the Division.*

- *The fill will be designed to attain a minimum long-term static safety factor of 1.5. The foundation and abutments of the fill must be stable under all conditions of construction.*

A geotechnical analysis has been completed for the proposed excess spoil structure. This analysis estimates the long-term safety factor to be 1.7 to 1.8 based on the proposed design. Following proper construction practices of building the structure in maximum four foot lifts and meeting 90% compaction based on the standard Procter will ensure that the structure will be stable under all conditions of construction. This construction will occur only in the designated excess spoil area as shown on Drawing 5-3 and 5-35. The fill will be placed with end dump haul trucks and lifts will be constructed using dozers. High precision GPS systems will be regularly utilized to check grades and appropriate lift thickness. The geotechnical analysis for this structure can be viewed in Appendix A5-1.

- *Be located on the most moderately sloping and naturally stable areas available, as approved by the Division, and placed, where possible, upon or above a natural terrace, bench or berm, if such placement provides additional stability and prevents mass movement;*

The excess spoil is planned to be placed in an area where natural grades range from 0 to 5%. This is one of the most moderately sloping locations in the Permit Area. Stability of this structure is estimated to be 1.7 to 1.8 based on the Appendix A5-1.

- *Be subject of sufficient foundation investigations. Any necessary laboratory testing of foundation material, will be performed in order to determine the design requirements for foundation stability. The analyses of foundation conditions will take into consideration the effect of underground mine workings, if any, upon the stability of the fill and appurtenant structures; and*

Geotechnical borings were completed in the foundation of the proposed disposal area. Laboratory analysis of these borings has also been completed. Details of this analysis can be viewed in Appendix A5-1.

- *Incorporate keyway cuts (excavations to bedrock) or rock buttresses to ensure stability where the slope in the disposal area is in excess of 2.8h:1v (36 percent), or such lesser slope as may be designated by the Division based on local conditions. Where the toe of the spoil rests on a downslope, stability analyses will be performed in accordance with R645-301-535.150 to determine the size of rock toe buttresses and keyway cuts*

Permanent slopes for the proposed excess spoil will not exceed 3h:1v (33 percent), therefore no keyway cuts have been proposed in the design. Appendix A5-1 details the stability analysis for the proposed structure.

- *Excess spoil may be disposed of in underground mine workings...*

Excess spoil will not be disposed of in underground mine workings.

- *Placement of Excess Spoil. Excess spoil will be transported and placed in a controlled manner in horizontal lifts not exceeding four feet in thickness; concurrently compacted as necessary to ensure mass stability and to prevent mass movement during and after construction; graded so that surface and subsurface drainage is compatible with the natural surroundings; and covered with topsoil or substitute material in accordance with R645-301-232.100 through R645-301-232.600, R645-301-234, R645-301-242, and R645-301-243. The Division may approve a design which incorporates placement of excess spoil in horizontal lifts other than four feet in thickness when it is demonstrated by the operator and certified by a professional engineer that the design will ensure the stability of the fill and will meet all other applicable requirements.*

Horizontal lifts will not exceed four feet in thickness unless otherwise approved by the Division. The lifts will be concurrently compacted to meet 90% of the standard Procter. The geotechnical analysis (Appendix A5-1), provides information showing that these construction standards will provide mass stability and will prevent mass movement during and after construction. The excess spoil will be graded to provide drainage similar to original flow patterns. Topsoil and subsoil as designated in Chapter 2 will be removed and separated from other materials prior to placement of spoil.

- *For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES the design of the spoil disposal structures will include the results of geotechnical investigations as follows:*

- 1) *The Character of the bedrock and any adverse geologic conditions in the disposal area;*

Refer to Appendix A5-1.

- 2) *A survey identifying all springs, seepage, and ground water flow observed or anticipated during wet periods in the area of the disposal site;*

Spring and seep survey information is provided on Drawing 7-1. There are no springs or seeps identified in the excess spoil area.

- 3) *A survey of the potential effects of subsidence of the subsurface strata due to past and future mining operations;*

There no historical underground mining operations in the proposed excess spoil area. There are also no future underground operations proposed.

- 4) *A technical description of the rock material to be utilized in the construction of those disposal structures containing rock chimney cores or underlain by a rock drainage blanket; and*

There are no rock chimneys or drainage blankets proposed.

- 5) *A stability analysis including, but not limited to, strength parameters, pore pressures and long-term seepage conditions. These data will be accompanied by a description of all engineering design assumptions and calculations and the alternative considered in selecting the specific design specifications and methods.*

The stability analysis and all supporting data are available in Appendix A5-1.

- *If for the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, under R645-301-535.112 and R645-301-535.113, rock-toe buttresses or key-way cuts are required, they will include the following:*

Neither rock-toe buttresses or key-way cuts are required under R645-301-535.112 or R645-301-535.113.

535.200. Disposal of Excess Spoil: Valley Fills/Head-of-Hollow Fills.

Not Applicable

535.300. Disposal of Excess Spoil: Durable Rock Fills.

Not Applicable

535.400. Disposal of Excess Spoil: Preexisting Benches.

Not Applicable

535.500. Faceup operations for underground coal mine development.

Not Applicable

536. Coal Mine Waste.

Not Applicable

537 **REGRADED SLOPES:**

537.100 Geotechnical Analysis:

The excess spoil structure and fill above approximate original contour are the only alternative specifications proposed. A geotechnical analysis has been completed for this proposal and can be viewed in Appendix A5-1. All other mined areas will be restored to approximate original contour.

540 RECLAMATION PLAN:

541.100 - 400 General

When coal mining is completed, all pits will be backfilled and reclaimed in accordance with the R645 rules and this permit. All equipment, structures, and other facilities, unless approved by the Division as suitable for the postmining land use or environmental monitoring, will be removed and the affected land reclaimed.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of "Administrative Rules for Water Well Drillers", State of Utah, Division of Water Rights or other applicable state regulations. Abandonment of wells will be performed by a licensed water well driller. The wells to be abandoned will be completely filled using neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout, or other materials approved by the Utah State Engineer's office. Alternatively, the well may be abandoned using a different procedure upon approval from the Utah State Engineer's office.

Abandonment materials will be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the State Engineer by the responsible licensed driller giving data related to the abandonment of the well. This shall include the name of the licensed driller or other person(s) performing abandonment procedures, name of well owner at the time of abandonment, the address or location of the well by section, township, and range, abandonment materials and equipment used, water right or file number covering the well, the final disposition of the well, and the date of completion.

Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to

minimize disturbance to the prevailing hydrologic balance. Exploration holes and boreholes will be managed to ensure the safety of people, livestock, fish and wildlife, and machinery.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

If any exploration boreholes are to be used as monitoring wells or water wells, these will meet the provisions of R645-301-731

Boreholes will be backfilled to within 1 foot of the land surface with concrete or other materials approved by the Division as necessary to prevent contamination of groundwater or surface-water resources or to protect the prevailing hydrologic balance. The upper approximately 1 foot will be backfilled with native materials to facilitate reclamation (see Drawing 6-11). Exploration holes and boreholes that may be uncovered during mining and reclamation activities will be permanently closed unless approved for water monitoring or otherwise managed in a manner approved by the Division.

542 **NARRATIVE, DRAWINGS AND PLANS:**

542-100 through 600 Plan and Timetable.

Reclamation at the Coal Hollow Mine includes both ongoing reclamation and final reclamation activities. Ongoing reclamation will follow mining operations as closely as practicable during the mine production phase. Major steps in the ongoing reclamation process are:

- **Backfilling and Grading.** The planned backfilling and grading operations are described more fully under section 553 below.
- **Topsoil and Subsoil Replacement.** Following grading, suitable topsoil and subsoil will be replaced on the regraded area. Topsoil may be direct placed from areas ahead of the mine, or may be taken from available stockpiled material. The planned topsoil operation will have topsoil ahead of the operation dozed into windrows, and loaded into trucks by a front end loader. The trucks will haul the topsoil to the regraded area, or to a temporary topsoil stockpile. Subsoil will be handled similar to topsoil. Once dumped on the regraded area, topsoil and subsoil layers will be dozed to a consistent thickness. Approximately 8 inches of topsoil is expected to be removed ahead of mining and replaced over the regraded area. Subsoil removed and replaced will average 40 inches thick and will be placed between the topsoil layer and run of mine spoil. The total profile thickness of topsoil and subsoil in mined areas will average 48 inches. Once in place, the area will be fine graded to remove small erosion features and depressions.
- **Revegetation.** Following replacement of topsoil the area will be revegetated by seeding. Mulch will be placed on the seedbed surface once soil amendments have been incorporated and seeding has been accomplished in areas that will be reclaimed to native plant communities (areas used for pasture lands will not be

mulched). The mulch should control erosion by wind and water, decrease evaporation and seed predation, and increase survivability of the seeded species. Like the seeding methods, mulch will be applied with a variety of techniques and materials depending on the reclaimed area.

Generally, mined areas will be backfilled and graded within approximately 180 days following coal removal, or 1,500 feet of the active coal removal face. One exception to this standard is during mining and backfilling of the final pits in the south end of the permit area. During this phase of mining, backfilling will follow approximately 2,000 feet from the active coal face. A detailed description of the reason for this variation are fully described in section 528 (Overburden) and the major steps can be viewed on Drawings 5-17 through 5-19. Areas needed for in-pit roads, ramps, drainage controls or areas which must be left open temporarily for operational reasons will be backfilled and graded when they are no longer needed. The rate of backfilling will depend on the availability of mined out pit areas for backfilling, and the rate of production at the mine. Based on anticipated production rates, Drawing 5-38 provides an estimated sequence and timing for reclamation.

Topsoil will be replaced on the graded areas as soon as operationally practicable. This work will depend on weather and soil conditions in the removal and replacement areas, but is generally anticipated to occur within 90 days of completion of regrading.

Revegetation activities will be seasonal in nature. As currently planned, initial seeding will occur at the first planting opportunity following replacement of topsoil. Supplemental seeding may be done subsequently as needed.

Some delay is unavoidable in reclamation of the initial mining areas due to the time required to establish the initial working pit and backfill area, and to achieve a steady state excavation/backfill operation. As currently planned the initial mining areas will be backfilled to the planned post mining contour, graded, and the topsoil replaced by late in the first year or in the first half of the second year of mining. Reclamation activities will proceed at the regular planned rate thereafter. Proposed final reclamation contours and cross sections can be viewed on Drawings 5-35 and 5-36.

The sequence and timing of reclamation activities is dependent on the coal production rate. Should that rate differ significantly from the current plan, the reclamation schedule will also vary.

Final reclamation includes the following:

- Backfilling and Grading. Backfilling of all final pits will commence at the conclusion of coal production. All highwalls, spoil piles, and depressions will be removed, except that small depressions may be constructed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation. No permanent final pit impoundments are currently planned. The

excess spoil structure will remain. All exposed coal seams, and acidic or toxic-forming strata will be covered with at least five feet of noncombustible material.

- Topsoil and Subsoil Replacement. 8 inches of topsoil underlain by 40 inches of subsoil will be placed on the backfilled pits and excess spoil. Other disturbed areas will have topsoil replaced (including facilities sites, roads etc.).
- Removal of Structures. Before abandoning the permit area or seeking bond release, all structures not needed for the approved post mining land use will be removed and reclaimed. The Lower Robinson Creek diversion is proposed to be permanent. Material from the coal stockpile base area and other areas where coal spillage may accumulate will be excavated and placed in a controlled manner in the final pit and covered with noncombustible material to prevent sustained combustion.
- Removal of Roads. Roads not retained for use under an approved postmining land use will be reclaimed immediately after they are no longer needed for mining and reclamation operations. Roads that are no longer needed will be closed to traffic; and all bridges and culverts removed, unless approved as part of the postmining land use. Prior to reclamation, surface material that is incompatible with the postmining land use and revegetation requirements will be removed from the roads and properly disposed of at the mine site. The roadbeds will be scarified or ripped to break up the surface. Topsoil will be replaced on the roadbed and the surface revegetated in accordance with the standards set forth in R645.
- Removal of Water Control Structures. All sedimentation control structures, including ditches, berms and sedimentation ponds not retained as part of the approved post-mining land use will be removed, the areas regraded, topsoiled, and revegetated.

Final pit backfilling, removal of buildings, roads and other facilities, along with replacement of topsoil is expected to require approximately 15 months after the last coal is removed. The bulk of this period will be required to backfill the final pits.

542.700. Final Abandonment of Mine Openings and Disposal Areas.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of “Administrative Rules for Water Well Drillers”, State of Utah, Division of Water Rights or other applicable state regulations. Abandonment of wells will be performed by a licensed water well driller. The wells to be abandoned will be completely filled using neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout, or other materials approved by the Utah State Engineer’s office. Alternatively, the well may be abandoned using a different procedure upon approval from the Utah State Engineer’s office.

Abandonment materials will be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the State Engineer by the responsible licensed driller giving data related to the abandonment of the well. This shall include the name of the licensed driller or other person(s) performing abandonment procedures, name of well owner at the time of abandonment, the address or location of the well by section, township, and range, abandonment materials and equipment used, water right or file number covering the well, the final disposition of the well, and the date of completion.

Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to minimize disturbance to the prevailing hydrologic balance. Exploration holes and boreholes will be managed to ensure the safety of people, livestock, fish and wildlife, and machinery.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

If any exploration boreholes are to be used as monitoring wells or water wells, these will meet the provisions of R645-301-731

Boreholes will be backfilled to within 1 foot of the land surface with concrete or other materials approved by the Division as necessary to prevent contamination of groundwater or surface-water resources or to protect the prevailing hydrologic balance. The upper approximately 1 foot will be backfilled with native materials to facilitate reclamation (see Drawing 6-11). Exploration holes and boreholes that may be uncovered during mining and reclamation activities will be permanently closed unless approved for water monitoring or otherwise managed in a manner approved by the Division.

542.720. Disposal of Excess Spoil.

A geotechnical analysis has been completed for the proposed excess spoil structure. This analysis estimates the long-term safety factor to be 1.7 to 1.8 based on the proposed design. Following proper construction practices of building the structure in maximum four foot lifts and meeting 90% compaction based on the standard Procter will ensure that the structure will be stable under all conditions of construction. This construction will occur only in the designated excess spoil area as shown on Drawing 5-3 and 5-35. The fill will be placed with end dump haul trucks and lifts will be constructed using dozers. High precision GPS systems will be regularly utilized to check grades and appropriate lift thickness. The geotechnical analysis for this structure can be viewed in Appendix A5-1.

Excess spoil that is combustible will be adequately covered with noncombustible material to prevent sustained combustion.

542.730. Disposal of Coal Mine Waste.

Not applicable

542.740. Disposal of Noncoal Mine Wastes.

Noncoal mine waste 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 temporarily stored in a controlled manner in a designated portion of the permit area and hauled offsite to a state approved recycling or solid waste disposal site. Final disposal of noncoal mine waste will not take place within the permit area.

542.800. Reclamation Cost.

The amount of the bond will depend upon the requirements of the *approved* permit and reclamation plan (R645-830.120).

A preliminary estimate of reclamation costs is included in Appendix 8-1. This estimate is based upon the proposed plan. A final bond estimate will be provided by the applicant to the Division upon completion of the approved permit and reclamation plan.

550. RECLAMATION DESIGN CRITERIA AND PLANS

551. SEALING AND CASING OF UNDERGROUND OPENINGS

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of “Administrative Rules for Water Well Drillers”, State of Utah, Division of Water Rights or other applicable state regulations. Abandonment of wells will be performed by a licensed water well driller. The wells to be abandoned will be completely filled using neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout, or other materials approved by the Utah State Engineer’s office. Alternatively, the well may be abandoned using a different procedure upon approval from the Utah State Engineer’s office.

Abandonment materials will be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the State Engineer by the responsible licensed driller giving data related to the abandonment of the well. This shall include the name of the licensed driller or other person(s) performing abandonment procedures, name of well owner at the time of abandonment, the address or location of the well by section, township, and range, abandonment materials and equipment used, water right or file number covering the well, the final disposition of the well, and the date of completion.

Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to minimize disturbance to the prevailing hydrologic balance. Exploration holes and boreholes will be managed to ensure the safety of people, livestock, fish and wildlife, and machinery.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

If any exploration boreholes are to be used as monitoring wells or water wells, these will meet the provisions of R645-301-731

Boreholes will be backfilled to within 1 foot of the land surface with concrete or other materials approved by the Division as necessary to prevent contamination of groundwater or surface-water resources or to protect the prevailing hydrologic balance. The upper approximately 1 foot will be backfilled with native materials to facilitate reclamation (see Drawing 6-11). Exploration holes and boreholes that may be uncovered during mining and reclamation activities will be permanently closed unless approved for water monitoring or otherwise managed in a manner approved by the Division.

552. PERMANENT FEATURES.

552.100

Small depressions may be constructed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation.

552.200

All impoundments will be reclaimed, no permanent impoundments are proposed.

553 BACKFILLING AND GRADING:

Backfilling and Grading of the mined area will proceed in conjunction with coal recovery operations.

The planned mine will recover approximately 5.02 million tons of coal, and remove approximately 31.6 million Bank Cubic Yards (BCY) of overburden. The following is a description of the overburden removal and backfilling process:

Based on the overburden isopach map (Drawing 5-15), the overburden removal and backfilling process has been separated into three major stages. The first stage of this process is for the initial mining area, Pits 1-8. These pits have a relatively low strip ratio, approximately 5:1 (refer to Drawing 5-13). In order to efficiently remove overburden for this phase, spoil from the first three pits will be placed in an excess spoil area. This excess spoil structure will hold approximately 2.7 million loose cubic yards (LCY) of material. Once the excess spoil pile is filled, overburden from Pits 4 through 8 can then be used as pit backfill as the mining progresses through Pit 8. The completion of this phase is shown on Drawing 5-17.

As mining progresses through Pits 9-15, the isopach (Drawing 5-15) shows that the overburden significantly increases. This increase and the shape of the mining boundary for the Permit Area require a fill above approximate original contour. Material from Pits 9-15 significantly exceeds the backfill capacity available from the preceding pits (Pits 1-8). The fill above approximate original contour blends in with the excess spoil structure

from Stage 1 and extends an additional 2,500 feet to the east as the mining sequence proceeds to Pit 15. In this stage, the fill above original contour is approximately 5.8 million LCY. Drawing 5-18 (Stage 2) shows the details of this stage of the overburden removal and resulting landform.

Stage 3 overburden removal begins in Pit 16 and proceeds through Pit 30. During this stage, the strip ratio reduces significantly from Stage 2 as mining progresses to the south end of the property. As the strip ratio reduces to the south, significant backfill capacity is available in the preceding pits. This results in the distance between the backfill and the active coal face increasing. At the end of mining, an area will not be completely backfilled that is approximately 2,000 feet in length and 1,300 feet wide and will require 6.8 million yards of fill to complete reclamation to approximate original contour. The backfill configuration at the end of this stage is shown in Drawing 5-19.

The proposed plan (Preferred Scenario) for backfilling the final pits is based on the assumption that Alton Coal Development, LLC will be successful with acquiring the adjacent federal coal reserves, located immediately to the west of the project area. This Preferred scenario for backfilling will minimize overall disturbance and maximize resource recovery by providing a transition into the adjacent federal reserves with minimal effect to existing reclamation and backfill in the Permit Area. This scenario will also minimize variances from approximate original contour on the federal lands by eliminating the need for an excess spoil structure from the initial boxcut as operations are transitioned into these reserves. In addition, this scenario provides a method for implementing concurrent reclamation during the project.

At the time that the transition occurs into the federal reserves, overburden will be removed from the federal reserves and placed in the final pits to approximate original contour. This final landform can be viewed on Drawings 5-35 and 5-36.

The following is an overburden and backfill balance for this scenario:

Preferred Scenario (Adjacent Federal Reserves Acquired)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	7,945,000	5,204,000	2,741,000	2,741,000
2	15,145,000	9,303,000	5,842,000	8,583,000
3	15,447,000	22,247,000	0	8,583,000
4 (Federal)	6,800,000	6,800,000	0	8,583,000
Total	45,337,000	36,754,000	8,583,000	8,583,000

*Loose Cubic Yards is estimated based on an overall 22% swell factor (Caterpillar Performance Handbook)

In the case that Alton Coal Development is not successful with acquiring the adjacent federal coal reserves, an alternate scenario has been developed. The Alternate scenario requires that all fill above approximate original contour and part of the excess spoil structure will be rehandled and placed in the remaining backfill area. The final landform

for this scenario is shown on Drawing 5-37. This step requires rehandle of approximately 6.8 million yards of spoil. In this scenario, reclamation of the project area will be significantly delayed and the transition into adjacent federal coal reserves will disturb additional backfill along the west permit boundary approximately 2,000 feet in length by 230 feet wide (10 acres). An additional excess spoil structure will need to be constructed on the federal lands if this area is mined to place material from the initial boxcut. Part of the excess spoil would likely be material removed from the Permit Area to access the coal beneath the Permit Area highwalls and provide the proper layback of the backfill material along the Permit boundary.

The following table summarizes the overburden and backfill balance for this scenario:

Alternate Scenario (Adjacent Federal Reserves Not Acquired)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	7,945,000	5,204,000	2,741,000	2,741,000
2	15,145,000	9,303,000	5,842,000	8,583,000
3	15,447,000	22,247,000	0	8,583,000
4 (Rehandle)	0	6,800,000	-6,800,000	1,783,000
Total	38,537,000	36,754,000	1,783,000	1,783,000

Backfilling and grading operations will follow coal removal operations as closely as practicable. Major steps in the backfilling and grading process are:

- Backfilling of the Mined Out Pit. Material from active pits will be used to backfill mined out pits as mining progresses. Material will be placed in the in-pit backfill in lifts, until the approximate planned final elevation is reached. Working stability in the backfill will be achieved by placement of the material, and control of the overall spoil face slope at stable angles. The mined out area will be filled to its planned post-mining elevation, which approximates the pre-mining land contour. The backfill will be inherently stable because the exposed surface will have shallow slopes, and the backfill surface will not be significantly higher than the surrounding undisturbed ground with the exception of the variance shown on Drawing 5-3.
- Backfilling of Ramps. Ramps and travelways within the active mining will be moved as necessary for safe operation and efficient hauling of overburden and coal. When a particular ramp or travelway is no longer needed, it will be backfilled with excavated overburden from the advancing pit.
- Grading. After backfilling is complete in each mined out area, the area will be graded using dozers and motor graders to achieve the planned post-mining contour, facilitate stable positive drainage patterns, and to blend in with the surrounding topography. Postmining slopes will not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long-term static

safety factor of 1.3 and prevent slides. A geotechnical analysis has been completed for the excess spoil structure and can be found in Appendix A5-1.

Timing of backfilling and grading operations will depend on the rate of mine advance and the availability of backfill space and material. Generally, it is planned that mined areas will be backfilled and graded within approximately 180 days following coal removal, or 1,500 feet of the active coal removal face. As described in the previous text and shown on Drawing 5-19, there will be a variance from this standard in the final pits. Areas needed for in-pit roads, ramps, drainage controls or areas which must be left open temporarily for operational reasons will be backfilled and graded as they become available.

Some delay is unavoidable in backfilling the initial mining areas due to the time required to establish the initial working pit and backfill area, and to achieve a steady state excavation/backfill operation. As currently planned, the initial mining areas will be backfilled to the planned post mining contour, graded, and the topsoil replaced in late Year 1.

553.110

Where practicable, the land will be restored to approximate original contour as shown on Drawing 5-35. In areas where excess spoil and variance from approximate original contour occur, the slopes will be regraded to a maximum angle of 3h:1v. A geotechnical analysis has been completed to verify that the spoil material will be stable long term. This analysis can be viewed in Appendices A5-1.

553.120

All highwalls will be eliminated in the final landform. Small depressions may be constructed as needed to retain moisture, minimize erosion, create and enhance wildlife habitat or assist vegetation. All spoil piles will be eliminated with the exception of the planned excess spoil and variance from original contour as shown on Drawing 5-35.

553.130

Postmining slopes will not exceed the angle of repose. Long-term static safety factors for slopes will exceed 1.3.

553.140

Slopes will be regraded and vegetated to minimize erosion and water pollution on and off the site.

553.150

Backfilling and grading will be conducted to support the approved postmining land use.

553.200 Spoil and Waste.

Spoil located in the excess spoil area and the variance from approximate original contour will be compacted to 90% of the standard Procter to provide long term stability of these structures. Remaining backfill in mined out areas will be confined and regraded to approximate original contour and will therefore not require compaction for long term stability. Subsoil will be placed over spoils and waste prior to placement of topsoil. This subsoil layer will provide a covering with minimal infiltration rate to prevent leaching of toxic materials.

553.210

Excess spoil from surface mining activities will be disposed of according to R645-301-211, R645-301-212, R645-301-412.300, R645-301-512.210, R645-528.310, R645-301-535.100 through R645-301-535.130, R645-301-535.300 through R645-301-535.500, R645-536.300, R645-301-542.720, R645-301-553.240, R645-301-745.100, R645-301-745.100, R645-301-745.300, and R645-301-745.400. Detail for meeting these standards can be reviewed in the corresponding sections.

553.220

Not Applicable

553.300. Covering of Exposed Coal Seams, and Acid- and Toxic-Forming Materials.

Exposed coal seams, acid- and toxic-forming materials, and combustible materials exposed, used, or produced during mining will be adequately covered with nontoxic and noncombustible materials, or treated, to control the impact on surface and ground water in accordance with R645-301-731.100 through R645-301-731.522 and R645-301-731.800, to prevent sustained combustion, and to minimize adverse effects on plant growth and on the approved postmining land use.

553.400. Cut and Fill Terraces

Not Applicable

553.500. Previously Mined Areas (PMA's) and Continuously Mined Areas (CMA's).

Not Applicable

553.600. Highwall Management

Not Applicable

553.700. Backfilling and Grading: Thin Overburden.

Not Applicable

553.800. Backfilling and Grading: Thick Overburden.

553.810

The spoil will be placed to attain the lowest practicable grade, and will not exceed the angle of repose for the material. A sequence of the steps for practicable movement of the excess spoil is shown on Drawings 5-17 through 5-19. The slopes on the excess spoil and variance from the approximate original contour will not exceed 3h:1v which will provide a long-term, stable structure.

553.820 - 553.830

Backfilling and Grading of thick overburden will meet the following requirements:

- *R645-301-211: The applicant will present a description of the premining soil resources as specified under R645-301-221. Topsoil and subsoil to be saved under R645-301-232 will be separately removed and segregated from other material.*

The soil resources for the proposed excess spoil disposal area are described in A2-1. A plan has been developed for removal of topsoil and suitable subsoil based on the soil descriptions in this appendices. The handling plan can be viewed on Drawing 2-2. Topsoil and acceptable subsoil will be separately removed and segregated from other material prior to placement of any spoil.

- *R645-301-212: After removal, topsoil will be immediately redistributed in accordance with R645-301-242, stockpiled pending redistribution under R645-301-234, or if demonstrated that an alternative procedure will provide equal or more protection for the topsoil, the Division may, on a case-by case basis, approve an alternative;*

Excess spoil will have topsoil and subsoil redistributed in an approximately uniform, stable thickness with the approved post mining land use, contours and surface water drainage systems. Material handling practices will prevent excess compaction of these materials. Handling practices will also protect the materials from wind and water erosion before and after seeding and planting.

- *R645-301-412.300: Criteria for Alternative Postmining Land Uses.*

Not Applicable

- *R645-301-512.210: Excess Spoil. The professional engineer experienced in the design of earth and rock fills will certify the design according to R645-301-535.100.*

A professional engineer experienced in the design of earth and rock fills with assistance from a geotechnical expert has certified the design according to R645-301-535.100. These certifications can be viewed on Drawings 5-35, 5-36 and 5-17 through 5-19.

- *R645-301-512.220: Durable Rock Fills*

No durable rock fills are planned.

- *R645-301-514.100: Excess Spoil. The professional engineer or specialist will be experienced in the construction of earth and rock fills and will periodically inspect the fill during construction. Regular inspections will also be conducted during placement and compaction of fill materials.*

A professional engineer or specialist that is experienced in the construction of earth and rock fills will inspect the fill during construction and regular inspections will also be conducted during placement and compaction of fill materials.

- *R645-301-528.310: Excess spoil will be placed in designated disposal areas within the permit areas within the permit area, in a controllable manner to ensure mass stability and prevent mass movement during and after construction. Excess spoil will meet the design criteria of R645-301-535. For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, the permit application must include a description of the proposed disposal site and the design of the spoil disposal structures according to R645-301-211, R645-301-212, R645-301-412.300, R645-301-512.210, R645-528.310, R645-301-535.100 through R645-301-535.130, R645-301-535.300 through R645-301-535.500, R645-536.300, R645-301-542.720, R645-301-553.240, R645-301-745.100, R645-301-745.100, R645-301-745.300, and R645-301-745.400.*

Excess spoil will be placed in the area designated on Drawing 5-3 and 5-35. This fill will be placed in lifts not to exceed 4 feet. The material will be transported from the overburden removal area to the fill by end dump haul trucks and a dozer(s) will spread the spoil to this lift thickness. The fill will meet at minimum 90% compaction as related to the standard Procter. Final slopes will be regraded to a maximum slope of 3h:1v. The top of the fill will sloped to approximately 2% to prevent pooling of water and to reestablish drainage similar to the original flow patterns. The excess spoil placed on the non-mined areas is approximately 32 acres and varies in height from 35 to 110 feet. The area of excess fill over mined out areas (variance from approximate original contour) is an extension of the fill placed on the non-mined area and is approximately 55 acres. Combined acreage of the excess fill placed on mined and non-mined areas is 87 acres and varies in

height from 60 to 100 feet above original contour. Total excess fill is 8.6 million yards. Design of this fill can be viewed in Drawings 5-35 through 5-36 and the geotechnical study can be viewed in Appendix A5-1.

- *R645-301-535.100 through R645-301-130: Disposal of Excess Spoil*

A geotechnical analysis of the excess spoil structure design has been completed by an expert in this field. The long term static safety factor for this structure design is estimated at 1.7 to 1.8. Lifts will be placed in thicknesses not to exceed 4 feet. The lifts will meet 90% compaction by the standard Procter. The fill will be graded to allow for drainage similar to original patterns and to prevent excessive infiltration of water. Fill will be covered with subsoil and topsoil as specified in Chapter 2 to provide conditions suitable for revegetation of the area. The geotechnical study can be viewed in Appendix A5-1.

- *R645-301-535.300 through R645-301-535.500: Disposal of Excess - Spoil Durable Rock Fills.*

Not Applicable

- *R645-301-536.300: Disposal of Coal Mine Waste in Excess Spoil*

No coal mine waste is planned in the excess spoil area.

- *R645-301-542.720: Excess spoil will be placed in designated disposal areas within the permit area, in a controlled manner to ensure that the final fill is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use. Excess spoil that is combustible will be adequately covered with noncombustible material to prevent sustained combustion. The reclamation of excess spoil will comply with the design criteria under R645-301-553.240.*

The excess spoil as shown in Drawing 5-35 and 5-36 will be suitable to the surrounding area and for the postmining land use of primarily grazing. No combustible excess spoil will be placed in the proposed structure. The reclamation of the spoil does not include any terraces and the slopes will not exceed 3h:1v.

- *R645-301-553.240: The final fill configuration of the fill (excess spoil) will be suitable for the approved postmining land use. Terraces may be constructed on the outslope of the fill if required for stability, control of erosion, to conserve soil moisture, or to facilitate the approved postmining land use. The grade of the outslope between terrace benches will not be steeper than 2h:1v (50 percent).*

The excess spoil as shown in Drawings 5-35 and 5-36 will be suitable to the surrounding area and for the postmining land use of primarily grazing. The

reclamation of the spoil does not include any terraces and the slopes will not exceed 3h:1v. This slope angle has been utilized at similar mining operations and found to be suitable for erosion control and revegetation of reclaim slopes. The long term static safety factor for these slopes is estimated to be 1.7 to 1.8.

- *R645-301-745.100: General Requirements.*

745.110: Excess Spoil will be placed in designated disposal areas within the permit area, in a controlled manner to:

745.111: Minimize the adverse effects of leaching and surface water runoff from the fill on surface and underground water;

Reclamation of the excess spoil will include a topsoil cover and subsoil layer. Infiltration through the reclamation is expected to be minimal based on the high clay content of these soils. In addition, laboratory data for the overburden shows that there is minimal potential for leaching of pollutants should infiltration rates become higher than expected.

The foundation of the excess spoil area also has high clay content with minimal potential for infiltration. This will provide an additional, natural barrier to protect ground water present beneath the proposed structure.

745.112: Ensure permanent impoundments are not located on the completed fill. Small depressions may be allowed by the Division if they are needed to retain moisture or minimize erosion, create and enhance wildlife habitat or assist revegetation, and if they are not incompatible with the stability of the fill; and

Permanent impoundments are not planned on the excess spoil area. Small depressions are also not planned in the excess spoil and are not viewed as a necessary enhancement to final reclamation based on average annual moisture data and the proposed slope configuration of the pile.

745.113: Adequately cover or treat the excess spoil that is acid- and toxic forming with nonacid nontoxic material to control the impact on the surface and ground water in accordance with R645-301-731.300 and to minimize adverse effects on plant growth and approved postmining land use.

Laboratory data representative of the overburden planned for disposal in the excess spoil area does not show acid- and toxic forming characteristics.

745.120: Drainage Control. If the disposal area contains springs, natural or manmade water courses, or wet weather seeps, the fill design will include diversions and underdrains as necessary to control erosion, prevent water infiltration into the fill and ensure stability.

A spring and seep survey available in Chapter 7 has identified no springs or wet weather seeps in the proposed excess spoil area. The final surface will be appropriately regraded to a contour that will route natural water from snowmelt and rainfall around the excess spoil as shown on the final contours Drawing 5-35. There are no manmade water courses present in the excess spoil area. No underdrains are planned for the excess spoil structure.

745.121: Diversions will comply with the requirements of R645-301-742.300

No diversions are planned in the excess spoil area.

745.122 : Underdrains

No underdrains are planned in the excess spoil area.

745.300: Durable Rock Fills

Not Applicable

745.400: Preexisting Benches

Not Applicable

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.