0013

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0013

TECHNICAL ANALYSIS

Beaver Creek Coal Company
Trail Mountain #9 Mine
Federal Lease Tract
UTU-64375
ACT/015/009

APR 17 1991

Emery County, Utah
April 15, 1991

File in:
- ☐ Confidential
- ☐ Shelf
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R614-301-100 GENERAL CONTENTS (SW)

112. Identification of Interests

Beaver Creek Coal Company is a Delaware corporation. The name and address of the applicant and operator is listed on page 2-1. The names and addresses of the officers, directors and principle shareholders are listed on pages 2-3 and 2-4. The applicant's corporation also operates West Elk Coal Company in Colorado and Thunder Basin Coal Company in Wyoming. Surface and coal ownership are identified on page 2-1. Surface and coal owners are the United States of America, State of Utah and Beaver Creek Coal Company. Ownership contiguous to the permit area is identified on page 2-5. The MSHA identification number is 42-01211. The applicant has no current interest in lands adjacent to the proposed permit area.

113. Violation Information

Neither the applicant nor any affiliate or persons under common control with the applicant has had a state or federal permit revoked. Nor has a performance bond or security been forfeited. A list of all violations in the past three years received by the applicant or under common control with the applicant is found in Appendix 2-2.

114. Right-of-Entry Information

The applicants right to enter and begin coal operations are found on page 2-8 through 2-10. The applicant lists the document, date of execution, and identifies the specific land to which the document pertains. A private mineral estate has not been separated from a private surface estate in this lease application.

115. Status of Unsuitability Claims

The proposed permit area is not within an area designated or under study as unsuitable for coal mining and reclamation operations (page 2-10). Additionally, there are no occupied dwellings within five miles of the permit area.

116. Permit Term

The lease permit will be renewed with the Trail Mountain #9 five-year permit renewal on February 21, 1995.

117. Insurance and Proof of Publication

Proof of publication is found in appendix 2-7. The newspaper advertisement was published January 29, 1991, through February 19, 1991, in the Sun Advocate and Emery County Progress. Insurance Certificate is found in the Trail Mountain #9 Mine permit in appendix 2-7.

140. Maps and Plans

All maps are of an acceptable scale and format. There is no mining related activity in the proposed permit area prior to August 3, 1977.

COMPLIANCE:

The applicant is in compliance with all sections of R614-301-100.

R614-301-200 SOILS (HS)

221. Prime Farmland Investigation

An investigation was conducted by the U.S.D.A./Soil Conservation Service to determine if prime farmland exists within the Federal Lease Tract. Ferris P. Allgood, State Soil Scientist, determined that no prime or important farmlands exist (Appendix 8-1{L}).

COMPLIANCE:

The applicant is in compliance with all sections of R614-301-200.

R614-301-300 BIOLOGY (SW)

320. Environmental Resources

No surface disturbance is associated with the proposed lease tract addition, therefore, reference areas and productivity requirements are not applicable.

A detailed description of fish and wildlife resources is found in Chapter 10 of the Trail Mountain #9 Mine permit. The proposed lease area is critical value deer and elk winter range. The fishery in Straight Canyon, from the junction of Cottonwood Creek up to Joes Valley Reservoir, is classified as a crucial-critical use area. Six Buteo nests and one golden eagles nest is identified in Straight Canyon adjacent to the proposed lease tract (Figure 10-4). The US Forest Service has determined that there are no listed threatened, endangered, or sensitive plants in the lease area (page 9-1). A concurrence letter was sent to the US Fish and Wildlife Service by the Division on April 5, 1991. The proposed lease area vegetative plant communities are delineated on Figure 9-1.

330. Operation Plan

Possible subsidence should be the only potential surface impact related to the lease tract addition. The permit identifies possible surface cracks, diminished spring flow, and escarpment failure. The applicant has committed to mitigate any damage caused by subsidence (page 12-4). The lease boundary along Straight Canyon has been set back from the escarpment in order to reduce the risk of escarpment failure (12-4b) and damage to raptor nests. Subsidence will be monitored as described in Chapter 12.

340. Reclamation Plan

This section does not apply.

350. Performance Standards

This section does not apply.

COMPLIANCE:

The applicant is in compliance with all sections of R614-301-300.

R614-301-400 LAND USE AND AIR QUALITY (SW)

411. Environmental Description

The lease tract is on US Forest Service land. Land use is a horse allotment and Deer Herd unit 35 (Figure 4-3). The US Forest Service manages the area for mining, grazing, recreation, wildlife habitat, and timber harvesting (pages 3-5 and 4-4). Cultural evaluations of historical, archeological and paleontological resources is based

on record and archival examination and surveys of the lease exploration drilling areas (Appendix 5-1{L}). No significant cultural or historic resources within the proposed lease tract are shown in Figure 5-1 (page 3-6). The State Historic Preservation Officer has given clearance for the lease area (personal communication with David Schirer, Utah State History, April 9, 1991).

412. Reclamation Plan

Since no surface disturbance is anticipated, the premining land use is the same as the postmining land use.

COMPLIANCE:

The applicant is in compliance with all sections of R614-301-400.

R614-301-500 ENGINEERING (JK)

510. Introduction

The applicant proposes to extend the present mining operation into Federal Lease, UTU-64375. This lease area contains approximately 2,631 acres and lies adjacent to the present mining area on its western and southern borders.

The proposed extension of operations is described in a volume which is separate from the Trail Mountain #9 permit. However, the extension will use the existing Trail Mountain #9 surface facilities and mine portals and will create no additional surface disturbance (see Chapter 1).

512. Certification

All maps which require certification under this and other relevant sections have been certified by a qualified, registered, professional engineer. The certified maps are: Plates 6-4 (Geologic Map--Hiawatha Seam), 6-7 (Hiawatha Seam--Overburden Thickness Map), 7-2 (Location of Seeps and Springs), 7-9 (Water Monitoring Locations), and 7-9A (Underground Water Monitoring Locations). Those maps which are included in the Lease Permit Application but require no certification are 3-10 (Permit Area Map), 4-2 (Surface Ownership Map), 4-3 (Land Use Map), 5-1 (Cultural Resources Survey), and 12--6 (Subsidence Monitoring Plan).

Since the Federal Lease involves no further surface disturbance, there are no plans or engineering designs that require certification.

513. Compliance with MSHA Regulations and MSHA Approval

This section is not applicable. Any and all provisions for sedimentation ponds, refuse plies, closure of entryways, and extinguishing of coal mine waste fires are found in the Trail Mountain #9 permit.

514. Inspections

This section is not applicable. Any and all provisions for the inspection of refuse piles or impoundments are found in the Trail Mountain #9 permit.

515. Reporting and Emergency Procedures

Any time a slide occurs which may have a potential adverse effect on public property, health, safety, or the environment, the applicant will notify the Division by the fastest available means and comply with remedial measures required by the Division (page 3-14).

All provisions for notification and remediation in the case of an impoundment hazard, as well as for temporary cessation of operations, are found in the Trail Mountain #9 permit.

520. Operation Plan

521.110 Previously Mined Areas

Besides the applicant's own operation, there are only two small abandoned mining operations in the vicinity of the Federal Lease: the Oliphant Mine and the Black Diamond Mine. These are located in Straight Canyon, to the south of the Federal Lease Tract. Both are shown on Map 4-2 (Surface Ownership Map).

521.120 Existing Surface and Subsurface Facilities

All existing surface and subsurface facilities and other manmade features are shown in Figure 3-1 (Surface Facilities) in the Trail Mountain #9 permit.

521.130 Landowners and Right of Entry and Public Interest Maps

All boundaries of lands and names of present owners of record of those lands, both surface and subsurface, are shown in Figures 3-10 (Permit Area Map) and 4-2 (Surface Ownership Map). The boundaries of land within the permit area upon which

the applicant has the legal right to enter and carry out coal mining and reclamation operations are shown in Figure 3-1 (Surface Facilities) of the Trail Mountain #9 permit.

521.140 Mine Maps and Permit Area Maps

The boundaries of all areas proposed to be affected over the total life of the operation are shown in Figure 3-10 (Permit Area Map). Underground workings and areas where methods for subsidence prevention or controlled subsidence will be employed are shown in Figure 12--6 (Subsidence Monument Plan).

521.150 Land Surface Configuration Maps

This part is not applicable as no new surface disturbance will be created as a result of the Federal Lease Tract.

521.160 Maps and Cross Sections of the Proposed Features for the Proposed Permit Area

The features, facilities, buildings, etc. mentioned in this part are shown on the Surface Facilities Maps of the Trail Mountain #9 permit.

521.170 Transportation Facilities Maps

Transportation facilities are shown on the Surface Facilities Maps of the Trail Mountain #9 permit.

521.200 Signs and Markers Specifications

This part is not applicable as no new surface disturbance will be created as a result of the Federal Lease Tract.

522. Coal Recovery

The applicant estimates that there are 48,800,000 tons of coal in place in the Federal Lease Tract and 13,200,000 tons are recoverable (page 3-3, Table 3-1). The applicant maintains that this rather low rate of recovery is justified because of the necessity of leaving 12 to 18 inches of top coal to prevent air slacking of the roof. Nevertheless, the applicant has a Resource Recovery and Protection Plan approved by the Bureau of Land Management to attain maximum economic recovery of the coal resource (page 3-4).

523. Mining Method

The method of mining in the Federal Lease Tract will be the same as that employed presently in the Trail Mountain #9 Mine: room-and-pillar mining with continuous mining machinery. Panels will be driven to the property boundaries and pillar extraction will then be carried out as roof and other conditions dictate. Sixty-foot barrier pillars will be left between panels. The applicant expects to increase annual production from the present level of 450,000 tons to a maximum of 1,200,000 tons (pages 3-1 to 3-2).

524. Blasting and Explosives

This section is not applicable. There will be no surface blasting in connection with the Federal Lease Tract.

525. Subsidence (JK/DD)

The applicant has conducted a survey of the surface area above the proposed lease. Timber, wildlife, grazing areas and water seeps are the renewable resources which occur in this area. There are no oil and gas wells, pipelines, utility structures, power transmission lines, or other buildings in the area (see pages 12-2 to 12-3).

The renewable resources in the area are not likely to be adversely affected by subsidence. The seeps that are present are surficial in nature. They are fed by precipitation and are dry most of the summer. In the event that roads, trails, or land surfaces are damaged appreciably by subsidence, the applicant will repair them and restore them to presubsidence usefulness (see page 2-3).

The applicant is committed to using practices which will control and minimize subsidence. Room-and-pillar methods with pillar extraction will be used in the mine. 100-foot barrier pillars will be left between development panels and the main entry pillars will have dimensions of 80 feet by 80 feet. In order to prevent subsidence-induced spalling of rock escarpments, the applicant will mine only to that distance from escarpments which is dictated by the projected 15° angle of draw (see pages 12-1 to 12-4a).

The applicant plans to extend the subsidence monitoring system presently used at the Trail Mountain #9 Mine to include the proposed lease addition. As at the existing Trail Mountain #9 Mine, subsidence will be monitored by conventional surveying of monuments. There will be 52 new monuments, which will be designated "9-1-S" through "9-52-S". Monuments will be placed over the center and ends of each panel except for monuments 9-45-S through 9-52-S, which will be placed over

escarpments and elsewhere outside of the mining area. All monuments will be surveyed and a subsidence reconnaissance survey conducted once a year. All of the information from the combined survey will be submitted to the Division in the Annual Report (see pages 12-5 to 12-5a and Figure 12-6).

Six months prior to mining, the applicant will send to all surface owners who may be affected by subsidence a mining schedule which will detail the area in which mining is to take place and the planned date of that mining activity. Appendix, 12-1(L) contains copies of the letters of notification (see page 12-4b and Appendix 12-1{L}).

The applicant intends to protect perennial streams (page 7-18a) by identifying which drainages are perennial and restricting mining activities to first-mining (development only). The area of mining restriction will be determined by projecting the angle-of-draw from a point 50 feet on each side of the stream down to the coal seam.

526. Mine Facilities

This section is not applicable. The locations and other details of all surface facilities are contained in the Trail Mountain #9 permit.

527. Transportation Facilities

This section is not applicable. Details of all road and conveyors are contained in the Trail Mountain #9 permit.

528. Handling and Disposal of Coal, Overburden, Excess Spoil, and Coal Mine Waste

This section is not applicable. What little spoil and coal mine waste produced in the proposed lease tract addition will be handled as described in the Trail Mountain #9 permit.

529. Management of Mine Openings

This section is not applicable. There will be no additional mine openings as a result of the proposed lease tract addition.

530. Operational Design Criteria and Plans

532. Sediment Control

This section is not applicable. Sediment control measures are described in the Trail Mountain #9 permit.

533. Impoundments

This section is not applicable. Designs, specifications, maintenance and inspection procedures, and other details of impoundments are contained in the Trail Mountain #9 permit.

534. Roads

This section is not applicable. Road designs and other details are contained in the Trail Mountain #9 permit.

535. Spoil

This section is not applicable. Spoil produced in the proposed lease tract addition will be handled as described in the existing Trail Mountain #9 MRP.

536. Coal Mine Waste

This section is not applicable. Coal mine waste produced by the proposed lease tract addition will be disposed of as described in the Trail Mountain #9 permit.

537. Regraded Slopes

This section is not applicable. Regrading of slopes and fills is described in the Trail Mountain #9 permit.

540. Reclamation Plan

542. Narratives, Maps and Plans

This section is not applicable. Maps and plans having to do with all phases of reclamation, including reclamation costs, are contained in the Trail Mountain #9 permit.

550. Reclamation Design Criteria and Plans

551. Casing and Sealing of Underground Openings

This section is not applicable. During reclamation, underground openings, of which there will be none additional as a result of the proposed lease tract addition, will be sealed and backfilled as described in the Trail Mountain #9 permit.

552. Permanent Features

This section is not applicable. Any features which are to remain after final reclamation are described in the Trail Mountain #9 permit.

553. Backfilling and Grading

This section is not applicable. All plans, maps and specifications for backfilling and grading are described in the Trail Mountain #9 permit.

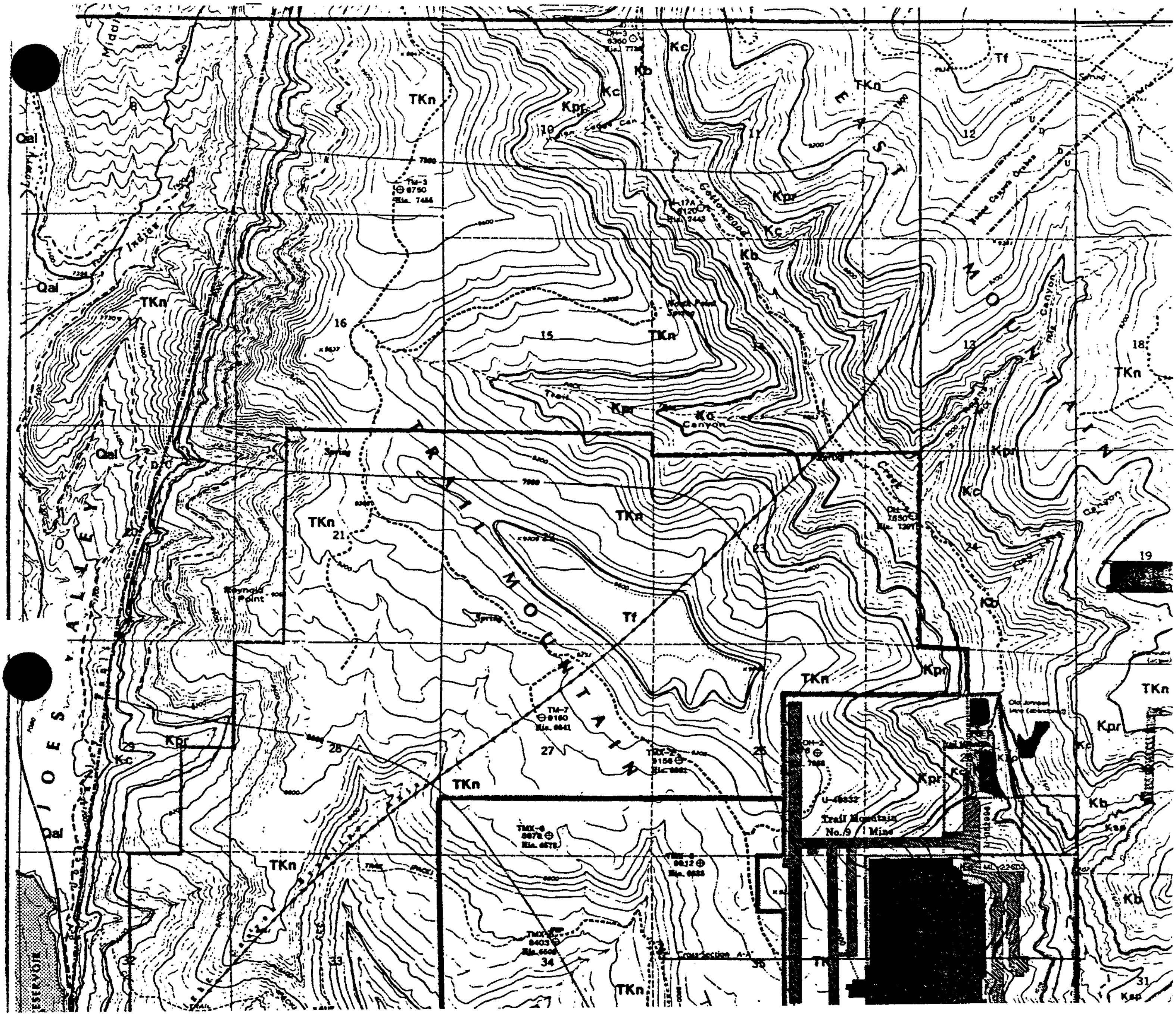
COMPLIANCE:

The applicant is in compliance with all sections of R614-301-500.

R614-301-600 GEOLOGY (DD)

The geology for the mine permit and adjacent area is discussed in Section 6 of the Lease Application Package. The applicant has presented a geologic description of the permit and adjacent area. A geologic map, Figure 6-4 identifies that mining will take place in the Hiawatha coal seam. The attitude of the coal seam is indicated to strike northwest and dip from 3 to 4.5 degrees to the southwest. An overburden isopach map (Figure 6-7) identifies a thickness over the mine plan area to be over 1000 feet. This lease area was established with the overburden thickness in mind. The proposed mining is designed to take place inside the limits of the escarpment to help ensure against escarpment failure, slumping and rockfalls. About one-third of Section 6 along Cottonwood Canyon, which is administered by the BLM, allows mining under lower cover (overburden), beyond the escarpment. However, mining is restricted to a maximum of fifty percent recovery. This is in conformance with the previous mining practices for earlier Trail Mountain leases.

The applicant has collected coal, roof and floor quality data. The results indicate very low pyritic sulfur and high neutralizing potentials. Monitoring will continue at intervals not to exceed 2000 feet intervals.



EAST MOUNTAIN
TRAIL MOUNTAIN
JOES VALLEY
TKn
Kpr
Kc
Kb
Tf
Qal
Canyon
Spring
Reynolds Point
TM-3
TM-7
TMX-2
U-46832
Trail Mountain
No. 9 Mine
Cross Section A-A'

In a conference held with Ken Fleck on April 4, 1991 information and data was presented identifying coal resources, thickness, quality and minability. The information was reviewed separate from the mine plan because the operator had requested confidentiality and non-disclosure in accordance with Title 40-10-10 , Utah Code Annotated and R614-300-124.300 of the Utah Coal Mining and Reclamation Regulations. Ken presented a structure contour map of the Hiawatha coal seam, cross-section B-B', coal isopach map of the Hiawatha coal seam, the coal quality and geology study and analysis workbook, a geologic conditions map (Figure 5.4), minable reserves estimates and geophysical studies for ground water conditions.

The applicant has accumulated data from 10 explorations drill holes, as well as drilling data that is public domain from monitoring wells developed by U.S. Geological Survey for a hydrologic study (Lines, 1985). Surveys of the property from the surface and adjacent mines indicate that there is no large scale faulting and fracturing over the lease area. The axis of the Straight Canyon Syncline runs diagonally from northeast to southwest along the northwest corner of the lease area. A geophysical study by the applicant indicates that no structural displacement occurs that presents an anomalous ground water zone or adversely affects mining operations.

COMPLIANCE:

The applicant is in compliance with all sections of R614-301-600.

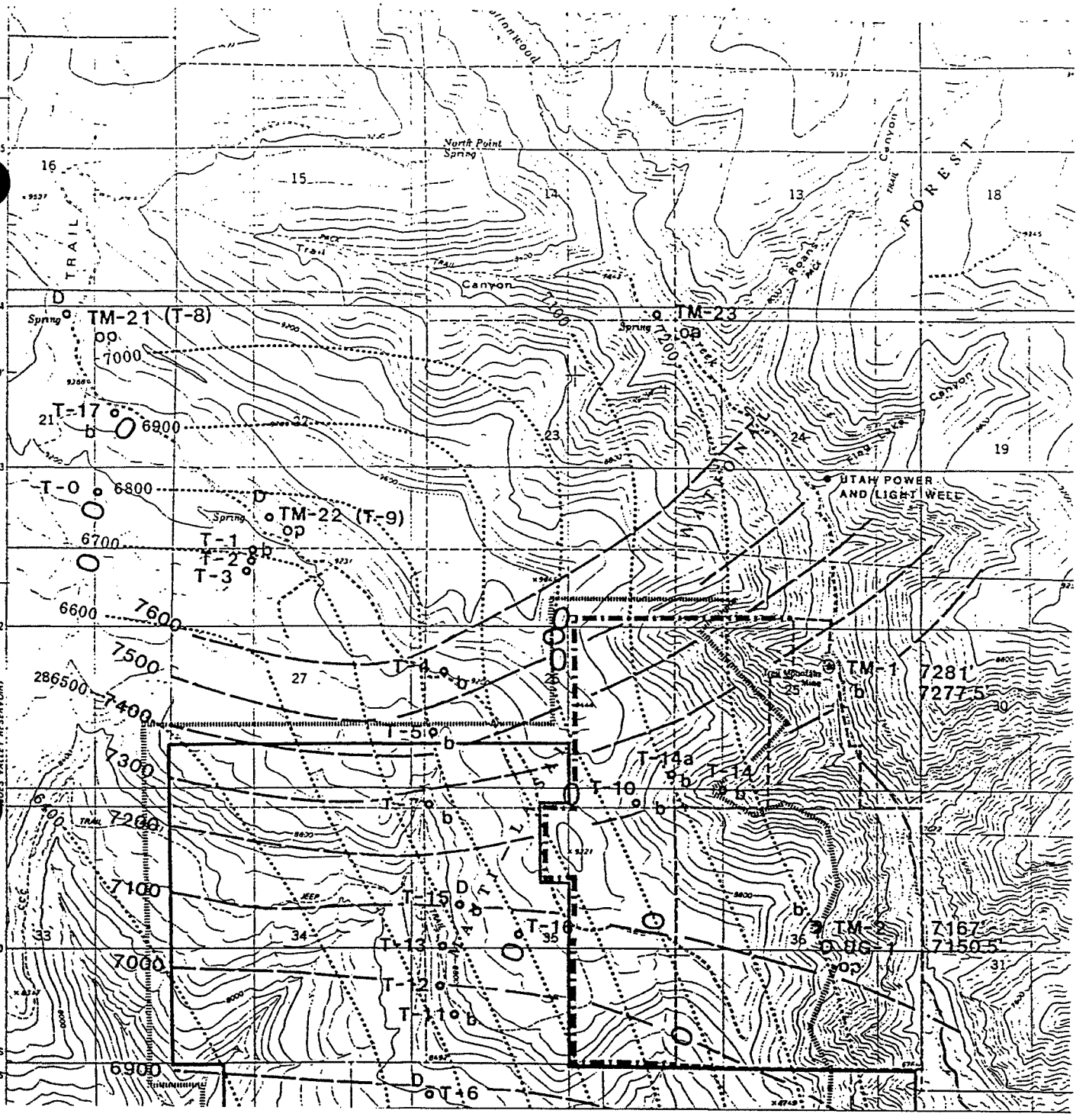
R614-301-700 HYDROLOGY (TM/DD)

722. Cross-Sections and Maps

722.100 Location and Content of Surface Water. The applicant has provided sufficient drillhole information to document that significant subsurface water was not encountered, therefore, this requirement is waived. See data presented in Appendix 7-15(L).

722.200 The locations of surface water bodies such as streams, lakes, ponds and springs within the permit area and adjacent area are shown on Figure 7-9.

722.300 The locations of monitoring stations used to gather baseline data on water quality and quantity is shown in Figure 7-9. The water monitoring program is discussed in Appendix 7-1(L).


North Point Spring
TRAIL
Canyon
FOREST
TM-21 (T-8)
op
7000
TM-23
op
7200
T-17
6900
T-0
6800
6700
TM-22 (T-9)
op
T-1
T-2
T-3
6600
7600
7500
7400
7300
7200
7100
7000
6900
T-4
T-5
T-14a
T-14
T-10
T-15
T-16
T-13
T-12
T-11
T-6
UTAH POWER AND LIGHT WELL
TM-1
7281'
7277.5
TM-2
7167'
7150.5
UG-1
op
T 17 S
T 18 S

722.400 One monitoring well, TM-1 located near the portal is monitored quarterly and shown on Figure 7-9. This well is used strictly for water monitoring (see page 7-9).

724. Baseline Information

724.100 Ground Water Information

The location and ownership for the permit area and adjacent areas of existing wells, springs, and other ground water sources is shown on Figure 7-9. The seasonal quality and quantity is collected on selected springs, wells, and surface water sources according to the schedule identified in Appendix 7-1(L).

The applicant has submitted information to describe the ground water regime to the extent as could be evaluated from the hydrologic studies that have been conducted adjacent to the area and from information and data collected by the applicant (i.e., occurrence and geologic framework).

Through an extensive drilling program no extensive ground water aquifers were shown to exist and therefore the ground water that does exist is most probably isolated and perched in nature and would be potentially impacted by mining. Since no regional aquifers appear to exist based on drilling data found in Appendix 7-15(L), no data on approximate rates of discharge or usage and depth to the water in the coal seam, and each water bearing stratum above and potentially impacted stratum below the coal seam was requested from the applicant. This assessment was based on the data submitted to date.

Spring inventories were conducted during the spring seasons of 1981 and 1985. Most springs were located in the North Horn Formation which is interbedded with sands, siltstones and mudstones. The applicant attributes the majority of springs in the area to perched aquifers that exist several hundred feet above the coal seam, and anticipates that mining will not have an influence or effect on their flow. The applicant has committed to conducting another spring study during the summer of 1991.

Information describing the ground water in the Blackhawk Formation and Star Point Sandstone Formations was derived from Lines (1985) hydrologic report. Hydraulic conductivity of the sandstones and shales, and the rapid change in facies in the Blackhawk severely restrict the flow of ground water through the formation.

The applicant identifies a potentiometric surface in the Star Point Sandstone (page 7-6). Figure 7-2 illustrates the potentiometric surface of the Blackhawk-Star Point aquifer at the level of the Hiawatha Coal Seam, which ranges from the 6400 feet

elevation at the southwest part of the lease area to 7200 feet elevation along the escarpment of the Cottonwood Creek.

724.200 Surface Water Information

The baseline water quality and quantity information is sufficient to demonstrate seasonal variation and water usage which is found in Chapter 7 of the Trail Mountain #9 Mine permit.

No wells are known to exist within or adjacent to the new lease. Water is produced in mine development from roof leaks, roof bolt holes and tension cracks. The current mine workings in Cottonwood Canyon are producing about 75 gallons per minute in the form of discharge. It is expected that expansion of the mine workings will increase mine water production proportionately. The applicant has committed to monitoring significant mine inflows.

725. Baseline Cumulative Impact Area Information

The necessary baseline hydrologic and geologic information has been submitted to assess the probable cumulative hydrologic impacts of the mining operations on surface and ground water.

Data from the applicant's drilling program has been submitted, as well as baseline data on existing surface and ground water monitoring points as shown on Figure 7-9 and in Appendix 7-15(L).

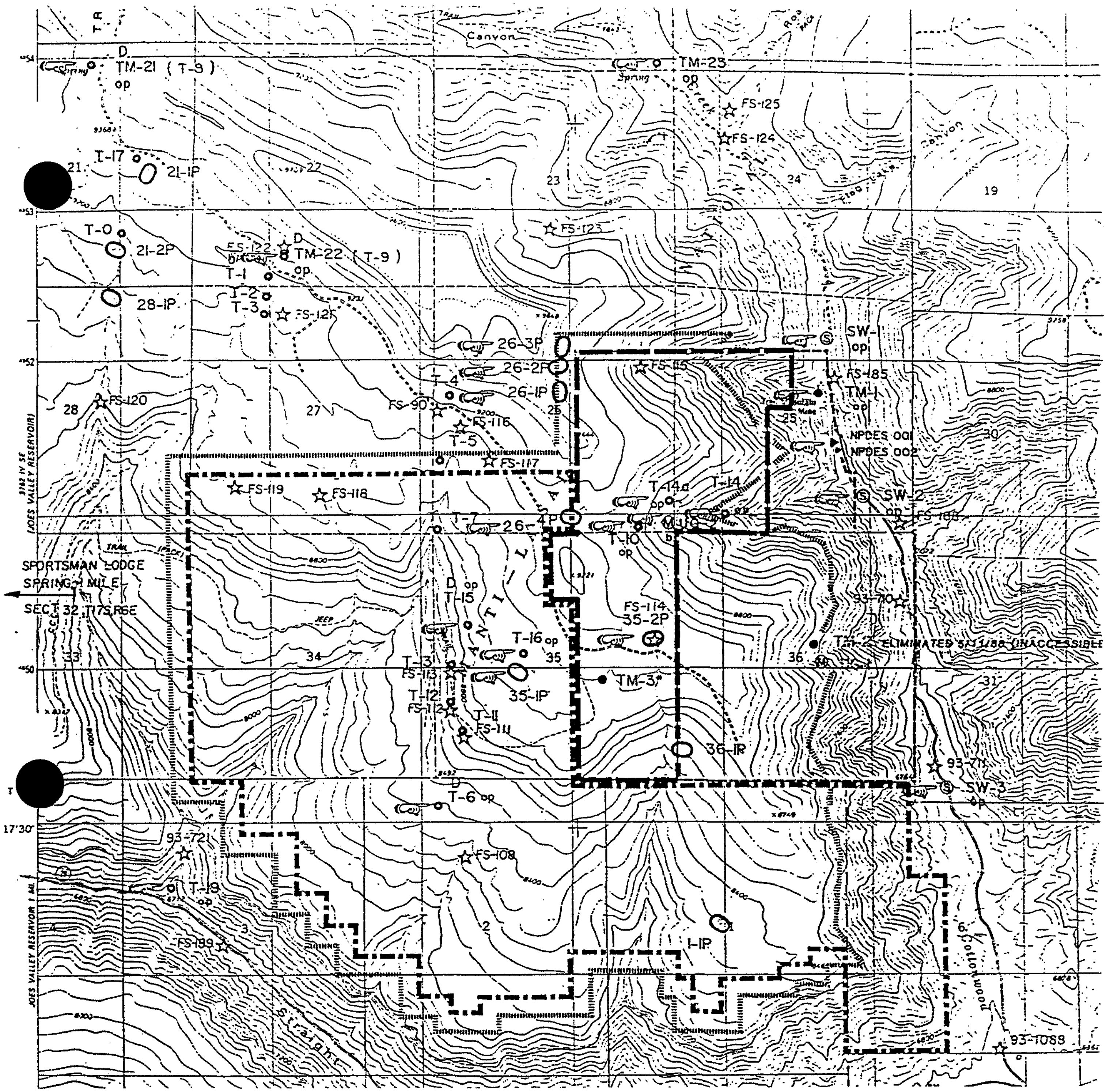
727. Alternative Water Source Information

The available source of water, if needed, would come from 20 shares of Cottonwood Creek Water owned by the applicant, Beaver Creek Coal Company. Beaver Creek Coal Company also owns 800 shares of the Huntington-Cleveland Water Rights (page 7-15).

A commitment for the repair or replacement of water rights affected by mining is found on pages 7-14 and 7-15.

728. Probable Hydrologic Consequences (PHC) Determination

The determination of the PHC is found in Section 7.1.5 of the PHC. There has been no indication of increased ground water occurrence from recent drilling in the Federal Lease Tract. There have been no documented impacts from mining on surface water resources. Adequate mitigation plans have been presented in the event



Canyon
TM-21 (T-8)
op
TM-23
op
Spring
FS-125
FS-124
T-17
21-IP
22
23
24
19
T-0
21-2P
FS-122
TM-22 (T-9)
op
T-1
T-2
T-3
FS-121
28-IP
FS-123
26-3P
26-2P
26-IP
T-4
FS-90
FS-116
T-5
FS-117
FS-115
SW-1
op
FS-185
TM-1
op
NPDES 001
NPDES 002
SW-2
op
FS-186
28
FS-120
27
25
30
FS-119
FS-118
T-14a
op
T-14
op
26-4P
T-10
op
SPORTSMAN LODGE
SPRING-1 MILE
SECT 32, T17S,R6E
JOES VALLEY RESERVOIR
T-15
D op
FS-114
35-2P
T-16 op
33
34
35
36
ELIMINATED 5/11/88 (INACCESSIBLE
93-710
T-13
FS-113
TM-3
31
T-12
FS-112
35-IP
T-11
FS-111
36-IP
93-711
SW-3
op
T-6 op
17'30"
93-721
FS-108
T-19
op
3
2
6
1-IP
FS-189
Straight
93-1088
JOES VALLEY RESERVOIR 1 MI.

large amounts of ground water are encountered or surface water resources are impacted from subsidence. Current projections of 72.62 gallons per minute of water being produced within the mine is based on estimates of the amount of water discharged during 1990 as documented on page 7-11e of the PAP. The overall occurrence of ground water being encountered within the mine falls in line with the theory that inflows are localized and not of a regional, large aquifer.

731.200 Water Monitoring

731.210 Ground Water Monitoring

The permit application contains a monitoring plan for ground water in Appendix 7-1(L). A commitment has been made to monitoring any water sources not previously identified at the completion of the 1991 water survey. This commitment is found on page 7-13 of the PAP.

However, the applicant needs to submit information to completely identify impacts to deep ground water sources, effects of mining on the Star Point aquifer. Information presented by the applicant indicates that the Star Point aquifer will be contacted during the mining process. A positive hydrostatic head will likely be contacted as the working extend west. Monitoring of the Star Point aquifer should take place to detect any changes in water quality and to identify the any impacts. Monitoring information is needed to identify the cumulative hydrologic impacts for the Star Point aquifer as ground water moves from the mine to locations off site. Therefore, special condition R614-301-731.200 must be addressed for the applicant to be in compliance.

731.220 Surface Water Monitoring

The surface water monitoring plan is presented in Appendix 7-1(L). This plan is in compliance with Division guidelines regarding parameters and frequency of monitoring. Any new surface water sources identified in 1991 water survey will be added to the monitoring plan.

Special Condition, R614-301-731.200 Water Monitoring

The applicant must monitor quality and quantity of the Star Point aquifer at a point where the flow in the aquifer leaves the permit area. The most likely place to develop this monitoring site is in the area near DH-5 (Figure 6-4). The applicant will be required to develop a well to monitor aquifer parameters, seasonal fluctuation, mining influence and hydrologic tests. The applicant will be required to construct the monitoring well within 90 days of permit approval. This information is requested in

accordance with the requirements for water monitoring regulations R614-301-731.200 through R614-301-731.215.

731.300 Acid- and Toxic-Forming Materials (HS)

The permittee has committed to regularly sample roof and floor material to determine its acid- and toxic-forming potential. Analysis will include taking samples at intervals not to exceed 2000' along the main entries and in at least one panel entry. Samples will be bagged and analyzed in accordance with the Division Guidelines for the Management of Topsoil and Overburden, Table 6 (page 6-12).

Previous analysis of roof, floor and midseam material may be located in Tables 6-2, 6-3 and in Appendix 6-2. Results indicate (2nd Left-Floor) an acid-forming potential of -81.7 Tons $CaCO_3$/1000 Tons Material. This is unacceptable when compared with Division criteria for acid forming potential (i.e., -5 Tons $CaCO_3$/1000 Tons Material, Division Guidelines for the Management of Topsoil and Overburden, Table 2). Underground waste rock material will be backstowed in the mine or trucked to the Castle Valley Spur Loadout Facility (Refer to C.V. Spur PAP). Backstowed material eminating from areas having acid- and/or toxic-forming roof and floor material, will be sampled further to determine its acid- and/or toxic-forming potentials.

The acid-forming floor material (Hiawatha Bed) will be closely monitored in the future. Continued roof and floor analysis and in mine water monitoring must proceed to determine the extent and impact of this material on the ground water resource.

COMPLIANCE:

The applicant is in compliance with sections of R614-301-700, except R614-301-731.200 through R614-301-731.215 (Special Condition).

jbe
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TECHNICAL ANALYSIS
TRAIL MOUNTAIN #9 MINE
ACT/015/009

Beaver Creek Coal Company
Emery County, Utah
February 21, 1990

UMC 783.27 Prime Farmland Investigation-(HS)

Existing Environment and Applicant's Proposal

The applicant asserts that there are no lands identified as prime farmland within the proposed permit area (page 8-6).

Compliance

On the basis of soil survey information and field review of lands within the permit area, there are no soil map units that have been designated prime farmland by the Soil Conservation Service (SCS). The negative prime farmland determination was authorized on February 4, 1986 by Ferris P. Allgood, State Soil Scientist (Appendix 4-3).

The applicant is in compliance with this section.

Stipulations

None.

UMC 785.19 Alluvial Valley Floors-(RVS)

Existing Environment and Applicant's Proposal

The lower portion of Cottonwood Creek (Section 31, T17S, R7E and Section 6, T18S, R7E) encompasses limited unconsolidated streamlaid deposits (Plate 6-4).

The valley floor along Cottonwood Creek has limited potential for agricultural development because of steep topography. Technical staff inspections have not identified the presence of flood irrigation. Moreover, the document entitled "Reconnaissance Maps to Assist in Identifying Alluvial Valley Floors, Central Utah" does not delineate potential alluvial valley floors within or adjacent to the permit area (Plate 3).

Compliance

Sufficient information about alluvial deposits and irrigation is available to determine as required by UMC 785.19(c)(2) that no alluvial valley floors exist.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.11 Signs and Markers-(PGL)

Existing Environment and Applicant's Proposal

The applicant has and will maintain mine identification signs, perimeter markers and stream buffer zone signs at this mine site until bond release (page 3-22).

Compliance

The applicant's commitment to maintain the required signs meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.13-.15 Casing and Sealing of Exposed Underground Openings-(RVS)

Existing Environment and Applicant's Proposal

Permanent abandonment of monitoring wells includes sealing water-bearing units with cement, backfilling other portions of the well with heavy mud, drill cuttings or cement, and installing a five-foot cement plug at the surface (Figure 3-11A).

During monitoring, wells will be temporarily sealed by installing casing and a threaded cap for access.

Portals will be permanently sealed with concrete blocks located 25 feet into the entryway (pages 3-52 and 3-53 and Figure 3-11). The entryway will be backfilled with noncombustible materials to the concrete seal. Seals will incorporate drain pipes to prevent blowouts (page 3-53). Portals will be temporarily sealed by installing chain link fence or wire mesh across the opening to prevent access (page 3-26).

Compliance

The applicant has provided adequate plans for temporary and permanent borehole sealing that are designed to prevent acid or toxic drainage from entering surface or ground waters and to minimize disturbance to the prevailing hydrologic balance.

The applicant has provided adequate plans for temporary and permanent sealing of mine portals.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.22 Topsoil: Removal-(HS)

Existing Environment and Applicant's Proposal

Topsoil was not separately removed from the majority of the surface disturbance (8.8 acres) created by mining activities at the Trail Mountain #9 Mine (page 3-36). Most of the existing disturbance occurred prior to the 1977 enactment of Public Law 95-87, the Surface Mining Control and Reclamation Act (SMCRA) (page 3-7). A small quantity of topsoil was separately removed and stockpiled from the borrow area (Figure 3-16). The borrow area provided fill material for culverting 2,000 feet of Cottonwood Creek and the embankment for the sedimentation pond (Appendix 8-1, page 1).

The applicant has proposed using substitute topsoil material as a plant growth medium for final reclamation (page 3-37). Existing on-site material (pad and fill material) is presently being field tested to determine the suitability of the surficial material. In 1984, a test plot was designed and installed just north of the bath house at the Trail Mountain #9 Mine site (Figure 3-1). A complete description of the revegetation test plot and the records of vegetative and soil sampling is included in Chapter 9 and in Appendix 9-1.

No new surface disturbance is planned. However, in the future, during upgrading operations or facility modification, all salvageable topsoil will be analyzed, separately removed, and stockpiled (page 3-52).

No premining soils descriptions and analysis were conducted for the disturbed area. However, soils were characterized from adjacent reference areas (page 8-1, Appendix 9-1-15). Two vegetative communities (riparian and grassland-shrub) were considered similar to the premining soil conditions. Profile descriptions and chemical and physical analyses of these communities are included on page 8-8 through 8-12.

Compliance

The applicant has proposed to use substitute topsoil material (i.e., pad and fill material) as a plant growth medium for final reclamation. Preliminary soils data from the proposed substitute topsoil material (Appendix 9-1, Table 6) indicate elevated salt activity (Electrical conductivity [E.C.]), Sodium Adsorption Ratio (SAR) and pH. Most of the soil samples (99.97 percent) were above an E.C. of 4 mmhos/cm at 25°C. Seventeen percent of the soil samples were sodic, i.e., an SAR of 12 or greater for fine-textured soils and an SAR of 15 or greater for coarse-textured soils. Saturated extract pH was greater than 8.2 in 31.7 percent of the soil samples. Hence, the material which constitutes the greater part of the proposed substitute topsoil may be considered a saline/sodic material as defined by the U.S.D.A. Agriculture Handbook No. 60, Saline and Alkali Soils, February 1954.

The soils placed in the revegetation test plots are reputed to be representative of the proposed substitute topsoil material. However, soil samples were not collected from the test plots at the time of construction. Therefore, only a qualitative assessment should be drawn from the determination below.

Analyses conducted in 1987 within the revegetation test plot indicate lower salt activity, SAR, and pH than in the pad and fill material, i.e., proposed substitute topsoil material. For example, 12.5 percent of the soil samples taken from the test plot had E.C. values greater than 4mmhos/cm at 25°C., none had an SAR greater than 12, and only 18.7 sobel percent had pH values greater than 8.2. Statistical manipulation (Student test) indicates a significant difference at a 95 percent confidence level between the E.C., pH, and SAR of the inplace fill material (proposed substitute topsoil material) and the E.C., pH, and SAR of the soil material in the revegetation test plots. (NOTE: Sample adequacy was not attained.) The soils in the revegetation test plots are reputed to be representative of the proposed substitute topsoil material (i.e., pad and fill material). However, soils samples were not collected from the test plots at the time of their construction, and hence, only qualitative conclusions should be drawn from these calculations.

Vegetative test plot data (Appendix 9-1) indicate favorable establishment of desirable perennial species. Continued monitoring (i.e., years 5, 9 and 10) of the revegetation test plots may reveal reference area comparability and suitable substitute topsoil material.

Soil sampling will be conducted at the time of final reclamation after backfilling and grading and prior to seedbed preparation to determine the E.C. value in the top 12 inches and the underlying 36 inches. The goal of this randomized block design sampling is to determine if the plant growth medium after grading has an E.C. value of 8 mmhos/cm (or less) for the top 12 inches and 16 mmhos/cm (or less) for the underlying 36 inches. If E.C. values exceed the above-noted limits, additional sampling will be necessary to isolate problem soils so that mitigation procedures may be implemented (Appendix 9-1-15).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.23 Topsoil: Storage-(HS)

Existing Environment and Applicant's Proposal

Topsoil was separately removed from the borrow area and stockpiled west of the intake portal (Figure 3-1). The stockpile has been seeded (page 3-36) to protect it from wind and water erosion.

Compliance

The applicant has adequately protected (i.e., perennial vegetative cover) the topsoil stockpile, located on a stable surface, from wind and water erosion.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.24 Topsoil: Redistribution-(HS)

Existing Environment and Applicant's Proposal

The applicant has committed to identify and test supplemental topsoil material in the event that the proposed substitute topsoil is determined to be unsuitable as a plant growth medium for final reclamation (page 8-10, Section 8.8). The applicant has committed to apply/prepare topsoil material to a depth of no less than six inches (page 8-13).

Stockpiled topsoil will be applied to the regraded spoils to a depth of six inches, starting at the north end of the topsoil storage area and continuing as far as material is available (page 3-56b).

In the event that soil analyses and visual surveys conducted during and after backfilling and grading operations indicate an acid- and/or toxic-forming potential or greater than 50 percent coal fines, the applicant has committed to cover all identified material with four feet of suitable non-acid and non-toxic forming materials or disposing of said material within the coal processing waste bank at C.V. Spur Coal Processing and Loadout Facility (pages 3-48, 3-58 and 3-58a).

Regraded soil/spoils will be ripped to a depth of 12 inches to 24 inches (page 3-57). If necessary, a disk or rototiller will be employed to pulverize large surficial clods (page 3-57). The surface of the reclaimed area will be left in a roughened condition (page 3-56b).

Compliance

The topsoil redistribution plan to uniformly apply/treat soil material to a depth of six inches is adequate to support the postmining land use.

Existing disturbed landfill material, if demonstrated to be suitable (see discussion under UMC 817.22), will be prepared to promote favorable vegetation establishment.

Scarification of regrade spoils should alleviate compaction and ensure good soil/spoil contact. Grading operationss will be conducted in such a manner as to maximize surface roughness, thereby creating surface water storage and decreasing erosive water velocities (i.e., decrease slope length).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.25 Nutrients and Soil Amendments-(HS)

Existing Environment and Applicant's Proposal

After backfilling and grading and prior to seeding, randomized soil samples (20-30) will be collected from the top six inches of regraded soil/spoils and analyzed to determine fertilizer type and application rates (Appendix 9-1-15, page 3-58a).

Compliance

The applicant has committed to sampling redistributed soil/spoil to determine types and rates of fertilizer application.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.41 Hydrologic Balance: General Requirements-(TM/RVS)

Existing Environment and Applicant's Proposal

Surface Water - (TM)

Runoff from all disturbed areas will be passed through sediment control facilities and will be monitored in accordance with the applicant's NPDES permit (page 7-63, PAP).

All changes in water quality or quantity are minimized by the use of the Best Sediment Control Technology Available. The effects of the mining operation on the surface water system are monitored as described in Appendix 7-1.

Ground Water - (RVS)

The applicant provides information about aquifers, springs and mine inflows in Chapter 7 and Appendices 7-1, 7-2, 7-5, 7-7, 7-9 and 7-10.

The applicant identifies the North Horn Formation, Price River Formation, Blackhawk Formation, and Star Point Sandstone as the major water-bearing lithostratigraphic units in the permit and adjacent area. The applicant concludes that zones of "perched" aquifers occur within certain permeable lithologies of the North Horn Formation and Price River Formation, whereas a regional aquifer occurs within the lower Blackhawk Formation and Star Point Sandstone.

Ground water within and adjacent to the permit area is used by wildlife, livestock watering and underground mine operations.

Figure 7-9 depicts three springs, designated T-10, T14A (North Horn Formation) and T-14 (Price River Formation), occurring within the permit area and projected subsidence area. Water monitoring data indicate flow to be less than 2.0 gpm for these springs (Appendix 7-2).

Potential mine inflow is calculated to be 70 gpm (7-10) and is collected in three sump areas entitled Main Sump, Sump 49 and Sump 68. At present, mine inflow is not sufficient to fulfill the needs for underground mine operations and water must be diverted to the workings from Cottonwood Creek.

Two boreholes, TM-1 and TM-2, have been developed in the permit area for the purpose of evaluating the regional aquifer. Data from these boreholes (page 7-9 and Appendix 7-2) agree with previously published information and indicate water levels occur within 20 feet of the mine floor in areas that are presently developed (Figure 7-1), the potentiometric surface slopes towards the south (Figure 7-1) and transmissivity is approximately 0.68 $ft.^2$/day (Appendix 7-2). The applicant proposes to develop an additional ground-water monitoring well, designated TM-3, following completion of development of the 1st South Mains (Figure 7-9A).

Water quality data presented in Appendix 7-2 indicate the North Horn Formation and Price River Formation springs are elevated with respect to calcium and magnesium, whereas data from the regional aquifer indicates increased TDS and sodium levels.

The applicant proposes to extract the Hiawatha seam using room and pillar methods with secondary pillaring everywhere within the permit area, except beyond the outcropping Castlegate Sandstone (Figure 3-6). Secondary pillaring will not occur where the Castlegate Sandstone does not overlie the Hiawatha seam. Approximately 1,300 acres will be mined in an area where overburden ranges in thickness from 900 to 2,200 feet (Figure 6-4).

The applicant projects that mining will encounter the regional aquifer and estimates that inflows will total approximately 70 to 165 gpm (Appendix 7-5). Furthermore, the applicant commits to providing specific mitigation plans for ground water supplies that have been impacted by mining (page 3-33).

Compliance

Surface Water - (TM)

The surface disturbance at the Trail Mountain #9 Mine is confined to 8.8 acres on and near the floor of the canyon. The applicant proposes no new surface disturbances over the life of the mine. The disturbed area is currently treated by the Best Sediment Control Technology currently available. No adverse changes to the hydrologic balance have been documented to date.

All undisturbed drainage is diverted through the site by the use of culverts. These culverts will be removed and channels reclaimed as described in Section 7.4 of the PAP. Riprap, filter blanket, flow designs and calculations are acceptable to the Division to document compliance with the regulations.

The sedimentation pond will remain in place during reclamation of the site, until such time that federal and state effluent limits are met.

The applicant is in compliance with this section.

Stipulations

None.

Ground Water - (RVS)

The applicant has provided adequate information about the use, occurrence and characteristics of ground-water resources within and adjacent to the proposed permit area.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.42 Hydrologic Balance: Water Quality Standards and Effluent Limitations-(TM)

Existing Environment and Applicant's Proposal

All surface drainage from the disturbed area is routed to a sedimentation pond via the disturbed area diversion system. All designs and calculations for sizes and flows in the diversion system at maximum discharge are presented in Table 7-8 of the PAP.

The sedimentation pond will remain in place during reclamation (page 3-56) to treat reclaimed area runoff until revegetation standards are reached and state and federal effluent limits are met. Two sections of culvert will be left in place following reclamation during Phase 1. All other diversions and culvert sections will be removed during Phase 1. Once revegetation standards are met, the sedimentation pond and remaining culvert sections will be removed and alternative sediment controls will be installed to ensure protection of the creek.

Compliance

The applicant provides adequate treatment of all surface and underground water discharged from the permit area and the mine during active mining operations and reclamation.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.43 Hydrologic Balance: Diversions and Conveyance of Overland Flow, Shallow Ground Water Flow, and Ephemeral Streams-(TM)

Existing Environment and Applicant's Proposal

The applicant has provided plans describing flows, velocities, and protection measures necessary for all disturbed and undisturbed area diversions (pages 7-49 through 7-51).

All disturbed area drainage and a small amount of undisturbed drainage is routed to a sedimentation pond. Cottonwood Creek and one major tributary is routed through the site (see Appendix 7-3 for culvert specifications).

Compliance

The applicant has adequately sized all conveyance systems (disturbed and undisturbed ditches and culverts) for the mine. The culvert in Cottonwood Creek is capable of passing the 50-year, 24-hour flood. Appendices 7-1, 7-3, and 7-4 provide information which demonstrate compliance with design specifications for all undisturbed culverts and diversions.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.44 Hydrologic Balance: Stream Channel Diversions-(TM)

Existing Environment and Applicant's Proposal

Because the mine is in close proximity to a perennial stream, it is proposed the sedimentation pond remain to treat reclaimed area runoff until revegetation standards are reached. A side canyon drainage and Cottonwood Creek will be restored as described in Appendix 7-3, using a trapezoidal channel configurations. All designs are based on the 100-year, 24-hour storm event and are described in Appendix 7-3.

Compliance

The applicant will reclaim Cottonwood Creek and the side canyon drainage in phases, leaving a portion of the culverts in place during the first phase of reclamation and removing them with the final reclamation of the sedimentation ponds. Large boulders will be used in Cottonwood Creek, creating a more natural setting. They will also provide additional habitat for aquatic organisms (page 3, Appendix 7-3).

The designs and calculations are exhibited in Appendix 7-3 and meet the requirements of this regulation.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.45 Hydrologic Balance: Sediment Control Measures-(TM)

Existing Environment and Applicant's Proposal

The main sediment control facilities consist of: (1) a 66-inch bypass culvert for Cottonwood Creek; (2) a 48-inch bypass culvert for the side canyon drainage; (3) a concrete curb and gutter system; (4) a sedimentation pond; and (5) various ditches and berms to convey runoff to the sedimentation pond (Appendix 3-4). In addition to these structures, the applicant has installed various sediment control structures (silt fences and straw bales) to minimize off-site sediment loading. Disturbed areas that are not needed for the operations will be seeded and mulched to provide protection and reduce erosion (Section 3.5.1, page 3-49).

The applicant has committed to using the best technology currently available (BTCA) to provide adequate sediment control during current operations and during reclamation (page 3-57). Two "BTCA" areas exist as shown on Figure 3-16. These two areas do not drain to the sedimentation pond but are treated as discussed on page 7-52a of the PAP.

Compliance

To reduce the amount of runoff that crosses the disturbed area, two bypass culverts have been installed for the Cottonwood Creek and Side Canyon drainages. All disturbed drainage is conveyed to the sedimentation pond, a NPDES discharge point. Water quality data provided in Appendix 7-2 demonstrates that the overall quality of the receiving water (Cottonwood Creek) is not degraded. In addition to culvert, ditches and berms, the applicant has installed other sediment controls at strategic locations to minimize erosion and insure water quality. Further, the applicant commits to disturb the smallest possible area, and revegetate areas that are not needed for the operations.

The appropriate sediment control measures are designed, constructed, and maintained to prevent erosion to the extent possible and prevent additional contributions of sediment to streamflow or to runoff outside the permit area.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.46 Hydrologic Balance: Sedimentation Ponds-(TM)

Existing Environment and Applicant's Proposal

The applicant discusses all designs and calculations for the sedimentation pond on pages 7-52 through 7-62 of the PAP. The sedimentation pond was designed to contain a sediment storage volume of .05 acre-feet of sediment per acre of disturbed area. The sediment yield for 5.5 acres of disturbed area will be 0.28 acre-feet. Sediment cleanout will be conducted at 60 percent of the sediment storage level (see Figure 7-13). All design details are shown on Figure 7-13.

Compliance

The applicant has met the design requirements of this regulation by providing adequate detention time, sediment storage and the proper combination of principal and emergency spillways. The sedimentation pond will not be removed during the bond period of reclamation until the vegetation success standards have been met (pages 3-56 and 3-57).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.47 Hydrologic Balance: Discharge Structures-(TM)

Existing Environment and Applicant's Proposal

The aplicant provides the design details for the erosion protection provided for discharge from the sedimentation pond on page 7-60, Figure 7-13, and Appendix 7-4.

Compliance

The applicant has provided adequate protection for the inlet and outlet of the sedimentation pond.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.48 Hydrologic Balance: Acid and Toxic-Forming Materials-(HS)

Existing Environment and Applicant's Proposal

The applicant provided chemical analyses of roof, floor, and interburden materials (transmitted to the Division February 21, 1990; to be submitted officially in the 1989 Annual Report). Underground development waste is disposed of in the mine or hauled to the coal processing waste bank at C. V. Spur Coal Processing and Loadout Facility (page 3-48a). Analyses of the bank material are conducted annually for the purpose of determining the acid- and/or toxic- forming potential (C.V. Spur Coal Processing and Loadout Facility PAP, Chapter 3 and Annual Monitoring Report). Sedimentation pond waste will be temporarily stored, analyzed and disposed of as outlined on page 3-48.

Analyses of the proposed substitute topsoil are located in Appendix 9-1, Table 6. Additionally, analyses will be conducted (pages 3-48, 3-58 and 3-58a) prior to backfilling and grading operations to characterize the acid- and/or toxic-forming potential and percent coal content of the disturbed landfill material.

The applicant has committed to covering all acid- and/or toxic-forming materials, materials having greater than a 50 percent coal content and material contaminated with oil and grease with four feet of suitable fill material.

Compliance

Roof and floor analyses indicate low potential for acid- and/or toxic-formation from underground development waste. Preliminary analyses of the proposed substitute topsoil material indicate high E.C. and SAR levels. During and after backfilling and grading operations, the applicant will determine the extent of elevated E.C. levels. The saline soil material and all other acid- and/or toxic-forming materials and materials having greater than a 50 percent coal content will be disposed of on site and covered with four feet of suitable non-acid and non-toxic forming material, or hauled to the C.V. Spur Coal Processing and Loadout Facility.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.49 Hydrologic Balance: Permanent and Temporary Impoundments-(TM)

Existing Environment and Applicant's Proposal

No permanent or temporary impoundments are proposed to be left in place following final reclamation. The single sedimentation pond will be left in place until the disturbed area is stabilized and applicable state and federal water quality standards are met (Section 3.5.3.3, page 3-56).

Compliance

The applicant does not propose to retain any impoundments for postmining land use at the Trail Mountain #9 Mine location.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.50 Hydrologic Balance: Underground Mine Entry and Access Discharges-(RVS)

Existing Environment and Applicant Proposal

Rocks in the permit and adjacent area strike N20°W and dip approximately S3.5°W (Figure 6-4). Mine inflow is estimated to be 57 gpm and is collected in three sump areas prior to dispersal throughout the mine.

Portals are updip from the workings and located at elevations between 7,260 and 7,290 feet (Figure 7-9). The belt entry and exhaust portals are at the lowest elevations. Permanent portal seals will incorporate a two-to-four-inch water drain pipe (Figure 3-11) to accommodate the flooding of workings and associated buildup of hydraulic head following mine closure.

Compliance

Portals are located and constructed to control gravity discharge from the mine. The mine currently experiences an approximate inflow of 57 gpm, a rate that is projected to increase to 130-200 gpm upon complete development of coal reserves.

Following mine closure, workings will flood and unplanned discharges may occur. The applicant commits to monitoring on a quarterly basis, as accessible, unplanned discharges (Section 7.1.7, page 10). Through monitoring, data will be derived pertinent to assessing whether or not discharges are in compliance with effluent standards. The applicant also commits to providing discharge treatment, if necessary, during the period of discharge, or until bond release.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.52 Surface and Groundwater Monitoring-(TM/RVS)

Existing Environment and Applicant's Proposal

Surface Water - (TM)

Section 7.2.6 (page 7-63) and Appendix 7-1 outline the Water Monitoring Program, stations sampled, parameters sampled, and duration of sampling. Updated water quantity and quality data are submitted to the Division in Annual Reports. The applicant monitors stations SW1, SW2, and SW3 on the North Fork of Cottonwood Creek monthly for field parameters and quarterly for laboratory measurements as identified in Attachment I of Appendix 7-1.

Ground Water - (RVS)

Section 7.1.7 of the application provides the discussion on ground-water monitoring. Springs T-10, T-14, and T-14A emanate within the zone of potential subsidence (Figure 7-9). T-10 and T-14 will be monitored in accordance with the schedule and parameters outlined in Appendix 7-1.

One well (TM-1) is monitored on a quarterly basis as outlined in Appendix 7-1. Proposed well TM-3 will be incorporated into the quarterly underground monitoring program upon completion of the 1st South Main (Appendix 7-1). On a quarterly basis, the operator will inventory the active portion of the mine to document location, rate, and geologic occurrence of inflows. Upon consultation with the Division, the operator will select, if any, certain inflows to be monitored. Ground-water monitoring data collected during the calendar year will be summarized and submitted to the Division on an annual basis (Section 7.1.7).

Compliance

Surface Water - (TM)

The applicant provides a monitoring plan for the runoff-fed ponds within the zone of potential subsidence. Quarterly inspections for subsidence fractures will be conducted when areas are accessible.

The applicant is in compliance with the Division's water monitoring guidelines and submits quarterly raw data reports to the Division. An Annual Report is submitted to the Division on March 31st of each year.

The applicant is in compliance with this section.

Stipulations

None.

Ground Water - (RVS)

The applicant has an up-gradient monitoring location (TM-1) in the regional (Blackhawk-Star Point) aquifer. Down-gradient monitoring will be at locations T-18 and T-19 (see Figure 7-9). T-18 is a postmining discharge and should be useful in gaging the postmine water quality of the Trail Mountain #9 Mine.

The applicant has provided an adequate plan for monitoring springs located within the zone of potential subsidence.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.53 Hydrologic Balance: Transfer of Wells-(RVS)

Existing Environment and Applicant's Proposal

The applicant commits (page 3-56) to permanently sealing all monitoring wells after they are no longer needed for data acquisition. Therefore, this section is not applicable.

UMC 817.55 Hydrologic Balance: Discharge of Water into an Underground Mine-(TM)

Existing Environment and Applicant's Proposal

The applicant does not propose to route drainage into any of the portal entries. All disturbed areas drain away from the portals (Figure 3-1).

Water for use in-mine is pumped from Cottonwood Creek to the main sump (Figure 7-9). The primary use of this water in the mine is for dust suppression at the working face.

Compliance

The importing of water for use in-mine is an operational requirement for safety at the working face. Based on the fact that the importation of water into the mine is strictly for operational needs, this practice does not conflict with the intent of 30 CFR 71.100.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.56 Hydrologic Balance: Postmining Rehabilitaiton of Sedimentation Ponds, Diversions, Impoundments, and Treatment Facilities-(TM)

Existing Environment and Applicant's Proposal

The applicant does not propose to retain any diversions, culverts, or ponds following final reclamation, therefore, this section is not applicable.

UMC 817.57 Hydrologic Balance: Stream Buffer Zones-(TM)

Existing Environment and Applicant's Proposal

Due to the narrow canyon and limited surface area, a 100-foot buffer zone is not feasible for Cottonwood Creek. A Macro-invertebrate Assessment for Cottonwood Creek was performed by Dennis K. Shiozawa and Calvin C. Speas (BYU) and concludes that the impact of Trail Mountain's mining operations on the Cottonwood Creek invertebrate community is negligible (Appendix 7-12).

Compliance

The Division received and reviewed stream cross-sections for Cottonwood Creek prior to installation of the 66-inch bypass culvert, and granted an approval to proceed with the installation on May 26, 1983 (approval letter from James W. Smith to Allen Childs). The applicant maintains a 50-foot buffer zone along the Cottonwood Creek channel.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.59 Coal Recovery-(PGL)

Existing Environment and Applicant's Proposal

The BLM's Resource Recovery and Protection Plan (R2P2) was originally approved on March 25, 1982 and Tract 2 was approved on May 19, 1986 (Appendix 8). Coal recovery is projected to be greater than 50 percent of the total in-place reserves. The Hiawatha Seam is the only coal seam of economic interest for the Trail Mountain tract. Total reserves are shown on page 3-14, Table 3-1.

Compliance

The applicant projects maximum recovery and conservation of the coal resource.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.61-.68 Use of Explosives-(PGL)

Existing Environment and Applicant's Proposal

The applicant proposes to do underground blasting only. These sections are not applicable because there will be no surface blasting (page 3-24).

UMC 817.71-.74 Disposal of Underground Development Waste and Excess Spoil and Non-Toxic and Non-Acid Forming Coal Processing-(PGL)

Existing Environment and Applicant's Proposal

The main source of underground development waste material is cutting overcasts. Rock from overcasts is deposited at strategically-located cross-cuts or rooms in the mine workings, i.e., "gobbed" underground (page 3-48). If this material is disposed of on the surface, it will be hauled to the C.V. Spur Coal Processing and Loadout Facility (a permitted area) and disposed of in the refuse pile in an approved manner.

Compliance

The applicant will dispose of development waste underground. Disposal of any underground development waste on the surface will also be at the C.V. Spur Coal Processing and Loadout Facility (a permitted area).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.81-.88 Coal Processing Waste Banks-(PGL)

Existing Environment and Applicant's Proposal

There is no coal processed at this mine site, therefore, this section is not applicable (page 3-7).

UMC 817.89 Disposal of Non-Coal Waste-(PGL)

Existing Environment and Applicant's Proposal

The applicant collects noncoal wastes in dumpsters and contracts with a local firm to haul the materials to an approved sanitary landfill (page 3-48).

Compliance

The applicant's method to dispose of noncoal waste meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.91-.93 Coal Processing Waste: Dams and Embankments-(PGL)

Existing Environment and Applicant's Proposal

There is no coal processed at this mine site, therefore, this section is not applicable.

UMC 817.95 Air Resource Protection-(WM)

Existing Environment and Applicant's Proposal

The applicant committed to reduce dust production during the mining operation (page 3-43) by incorporating the following practices:

1. Periodic watering;
2. Wetting of coal during handling activities;
3. Keeping the size of the disturbed area minimal; and
4. Revegetation of disturbed areas as soon as practicable.

Compliance

The applicant's commitment to reduce dust production meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.97 Protection of Fish, Wildlife and Related Values-(WM)

Existing Environment and Applicant's Proposal

Wildlife resources are described in Chapter 10. Tables 10-1 through 10-9 itemize fish and wildlife species including terrestrial and aquatic vertebrates and macroinvertebrates. Five terrestrial habitats and a small riparian area are included in the permit area (Section 10.3-1). The terrestrial areas include the following: pinyon-juniper, grass-aspen, cliff, mixed conifer and mixed mountain shrub.

A raptor survey was conducted in C.Y. 1981 and 1982, and survey results are summarized on Table 10-8. No raptor nests were identified, but future raptor nests will be reported to the Division. All power poles have raptor protection and clearance was provided by U.S. Fish and Wildlife Service (letter from Lynn Kunzler dated November 26, 1982).

The applicant's commitment to protect fish, wildlife and environmental values is included in Section 3.4.6.2.

Compliance

The total disturbed area is very small, and whereas the minesite lies in the bottom of a steep canyon and adjacent to a well-traveled Emery County highway, the environmental and fish and wildlife impacts are minimal.

The applicant has provided adequate mitigation to protect fish, wildlife, and environmental values.

The applicant has committed to notify the Division if threatened or endangered wildlife species are observed in the permit area.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.99 Slides and Other Damage-(PGL)

Existing Environment and Applicant's Proposal

The applicant commits to notify the Division at any time a slide occurs which may have a potentially adverse effect on public, property, health, safety of the environment, and comply with required remedial measures (page 3-47A).

Compliance

The applicant's commitment to notify the Division meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.100 Contemporaneous Reclamation-(WM)

Existing Environment and Applicant's Proposal

The applicant commits to reclaim areas not needed for mining as contemporaneously as possible (Section 3.5.1).

Compliance

Final reclamation will be conducted immediately after site preparation and during the first normal period of favorable planting conditions. The applicant's contemporaneous reclamation plan is in compliance with this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.101 Backfilling and Grading Plan-(PGL)

Existing Environment and Applicant's Proposal

The applicant proposes to grade and contour the minesite after the removal of all surface structures (page 3-57). Postmining contours for the Trail Mountain #9 Mine are shown on Figure 3-12. The plan incorporates grading and contouring, reduction of highwalls, erosion control, and stabilization. Highwalls will be reduced as is practicable for the site and the applicant demonstrates a static safety factory of at least 1.3 (Appendix 3).

Compliance

The backfilling and grading plan will return the facilities area to a stable landform which will resemble the premining topography. The stability analyses for the area are adequate.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.103 Backfilling and Grading: Covering Coal and Acid- and Toxic-Forming Materials-(HS)

Existing Environment and Applicant's Proposal

The applicant commits to covering all acid- and/or toxic-forming materials with a minimum of four feet of non-acid and non-toxic forming material, or hauling it to the C.V. Spur Coal Processing and Loadout Facility (page 3-58a).

Material which has been identified as saline and/or sodic (see discussion under UMC 817.24) will be buried along the highwalls and covered with four feet of non-acid and non-toxic forming materials.

Compliance

The applicant's commitments meet the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.106 Regrading or Stabilizing Rills and Gullies-(PGL)

Existing Environment and Applicant's Proposal

The applicant provided a specific plan for monitoring and regrading rills and gullies greater than nine inches (page 3-57).

Compliance

The applicant's commitment to regrade and/or stabilize rills and gullies meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.111 Revegetation: General Requirements-(WM)

Existing Environment and Applicant's Proposal

The applicant commits to utilize the results from the vegetation test plot for final reclamation. The applicant's temporary revegetation plans and seed species are described on page 3-57A and Tables A-9-1 through A-9-8. Level to moderate slopes will be drillseeded and steep slopes will be hydroseeded (page 3-58). The seeding rates for the two mixes are 16.10 lbs. (PLS) for the riparian community and 20.9 lbs. (PLS) for the grassland-shrub community.

Compliance

All plant species in the final revegetation seed mix and planting stock are compatible with postmining land uses and will provide suitable ground cover for erosion protection, wildlife habitat, livestock forage and esthetics. All plant species are perennial except for yellow sweetclover, which is biennial. All plant species are capable of regeneration and plant succession.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.112 Revegetation: Use of Introduced Species-(WM)

Existing Environment and Applicant's Proposal

The applicant commits to utilize the results from the vegetation test plot seeded in 1984 for final reclamation. Based on this data, seed mixes will be revised accordingly (page 3-58).

Seed mixes contain introduced species.

Compliance

The applicant has conducted vegetation studies, provided data for years 2 and 3, and committed to provide data for years 5, 9 and 10. The final reclamation seed mixes will be based on best technology available and results from the vegetation test plots.

Introduced species are fast-growing, aid in soil stabilization, and some are nitrogen-fixing plants.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.113 Revegetation: Timing-(WM)

Existing Environment and Applicant's Proposal

Seeding as well as planting of containerized stock will be undertaken during the first normal period for favorable planting conditions after final site preparation (Section 3.5.5, Table 3-2).

Compliance

The applicant's proposal meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.114 Revegetation: Mulching and Other Soil Stabilizing Practices-(WM)

Existing Environment and Applicant's Proposal

Native hay mulch will be applied at a rate of one ton/acre on level to moderately sloped areas (page 3-58a). On steep slopes, hydromulch and tackifier will be used.

Compliance

Mulching practices, rates of application, and methods of anchoring meet the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.115 Revegetation: Grazing-(WM)

Existing Environment and Applicant's Proposal

Reclaimed areas will be fenced and protected from livestock grazing. Livestock grazing will not be authorized until final bond release (Section 3.5.5.3).

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.116 Revegetation: Standards for Success-(WM)

Existing Environment and Applicant's Proposal

Revegetation success will be based on comparisons with two approved reference areas (Section 9.3.8). Revegetation monitoring will be conducted after reclamation as follows: (1) qualitative - years 2 and 3; (2) quantitative - years 2, 3, 5, 9 and 10; and (3) comparison to reference areas - years 9 and 10.

If problems such as severe erosion (rilling 9" and over), inordinate soil loss, excessive weed invasion, failed revegetation establishment, or rodent damage occur, the applicant has committed to maintain or perform the required corrective work (page 3-57a).

Compliance

Bond liability will continue for not less than 10 years.

Monitoring commitments are adequate to document progress toward realization of reclamation objectives.

Ground cover, woody plant density, and production will be considered equal to the respective reference areas when there is 90 percent success at 90 percent statistical confidence (Section 3.5.5.4).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.117 Revegetation: Tree and Shrub Stocking-(WM)

Existing Environment and Applicant's Proposal

Woody plant stocking is included because one of the postmining land uses is wildlife habitat. The applicant proposes to plant six woody species, including willow cuttings (Tables 3 and 4). Willow cuttings will be planted on the three-foot centers along the sides of the restored Cottonwood Creek channel.

Compliance

The applicant commits to supplemental replanting of woody species in the event plant establishment does not meet bond release standards.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.121-.126 Subsidence Control-(RVS)

Existing Environment and Applicant's Proposal

The applicant provides information about subsidence in Chapter 12 and Appendix 12. Supplementary subsidence information is given on Figures 12-5 through 12-8.

Mining will occur in the Hiawatha seam. Coal extraction will be accomplished by first mining (room and pillar method) followed by second mining or pillar removal (Figure 3-6 and pages 3-6 through 3-9). Second mining will not occur beneath areas where the Castlegate Sandstone is absent (Figure 3-6). Overburden thickness ranges from approximately 900 to 2,200 feet (Figure 6-5). Mining has encompassed approximately 700 acres and will encompass another 600 acres in the permit area (Figure 3-6). The application utilizes a value of 15 degrees, based on studies conducted in adjacent mining areas (Utah Power and Light Company) and overburden thickness, for the angle-of-draw. In addition, the applicant derives a range (1.85 to 2.70 feet) of values for maximum vertical movement (page 12-13). Figure 7-9 shows the projected maximum lateral extent of subsidence at the surface.

The applicant identifies renewable resource lands above areas of proposed mining (page 12-15). The applicant concludes, on the basis of mining methods, stratigraphy, and overburden thickness, that surface manifestations of subsidence (tension cracking, catastrophic failure) and impacts to renewable resource lands (springs, livestock grazing) will be minimal (page 12-16).

The applicant commits to restoring trails or roads that are materially damaged by subsidence and notifying surface owners that may be affected by the subsidence of the mining schedule (page 12-16). In addition, the applicant commits to restoring surface areas impacted by subsidence and compensating owners for livestock losses due to subsidence (page 12-16).

The applicant provides a subsidence monitoring plan that describes vertical and horizontal data acquisition by photogrammetric and conventional survey methods (Appendix 12-2, page 12-17). Monitoring points are located on Figures 12-6 (conventional monuments) and 12-7 (photogrammetric). Data indicates maximum vertical movement of 1.37 feet between 1986 and 1988 (Appendix 12-4).

Compliance

The applicant provides information about mining methods and locations, overburden thickness and lithology, vertical movement, renewable resource lands and structures.

Maximum subsidence of up to 2.70 feet is projected for portions of the permit area where three springs occur (T-10, T-14, and T-14A). The applicant recognizes a potential for subsidence-induced material damage to springs and thus, a possibility for reduction in value or reasonably foreseeable use of surface lands. Accordingly, the applicant proposes to mitigate spring damage and attendant reduction in land-resource value or use by installing guzzlers (page 4-11). The applicant also commits to restoring or rehabilitating trails, roads and lands that are damaged by subsidence and compensating livestock owners.

The applicant provides a subsidence monitoring plan that describes survey methods, monument locations, data reduction, notification of surface owners, and methods of data presentation. A commitment to submit annual subsidence data has been provided (page 12-17).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.131 Cessation of Operations: Temporary-(PGL)

Existing Environment and Applicant's Proposal

The applicant commits to notify the Division in the event that operations are ceased for more than 30 days and to submit a Notice of Intent to Temporarily Cease Operations (page 3-26).

Compliance

The applicant's commitment to notify the Division when operations are temporarily ceased and to comply with the requirements of the Notice of Intent to Temporarily Cease Operations meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.132 Cessation of Operations: Permanent-(PGL)

Existing Environment and Applicant's Proposal

The entire PAP addresses the reclamation of the Trail Mountain #9 Mine when operations cease.

Compliance

The reclamation of the Trail Mountain #9 Mine meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.133 Postmining Land Use-(WM)

Existing Environment and Applicant's Proposal

Coal mining at the Trail Mountain #9 site has been operational since 1946. Prior to that time, use of the permit area included livestock grazing, wildlife habitat and wildland recreation.

Postmining land uses will revert to premining land uses. Upon reclamation and after final bond release, the reclaimed area will again support premining uses (Section 4-5).

Compliance

The applicant's proposed reclamation plan and protection measures are feasible and consistent with postmining land uses.

The applicant is in compliance with this section.

Stipulations

None.