

State of Utah
Division of Oil, Gas and Mining
Utah Coal Regulatory Program



Technical Analysis and Findings
Dugout Canyon Mine
PRO/007/039
August 1, 1997

TABLE OF CONTENTS

| | |
|-------------------------------------------------------------------|----|
| ENVIRONMENTAL RESOURCE INFORMATION | |
| General | 1 |
| Permit Area | 1 |
| Maps, Plans, and Cross Sections of Resource Information | 3 |
| Affected Area Boundary Maps | 3 |
| Existing Structures and Facilities Maps | 3 |
| Existing Surface Configuration Maps | 4 |
| Mine Workings Maps | 5 |
| Permit Area Boundary Maps | 5 |
| Surface and Subsurface Ownership Maps | 5 |
| Findings | 6 |
| SOILS RESOURCE INFORMATION | |
| Analysis | 7 |
| Soil Survey | 7 |
| Findings | 7 |
| HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION | |
| Analysis | 8 |
| Findings | 8 |
| VEGETATION RESOURCE INFORMATION | |
| Analysis | 8 |
| Findings | 9 |
| FISH AND WILDLIFE RESOURCE INFORMATION | |
| Analysis | 10 |
| Findings | 11 |
| LAND USE RESOURCE INFORMATION | |
| Analysis | 12 |
| Findings | 12 |
| GEOLOGIC RESOURCE INFORMATION | |
| Analysis | 13 |
| Findings | 16 |
| HYDROLOGIC RESOURCE INFORMATION | |
| Sampling and Analysis | 17 |
| Ground Water Information | 17 |
| Surface Water Information | 19 |
| Climatological Information | 20 |
| Baseline Cumulative Impact Area Information | 20 |
| Modeling | 21 |
| Alternative Water Source Information | 21 |
| Probable Hydrologic Consequences Determination | 21 |
| MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION | |
| Analysis | 25 |
| Coal Resource and Geologic Information Maps | 25 |
| Monitoring Sampling Location Maps | 26 |
| Subsurface Water Resource Maps | 26 |

| | |
|-----------------------------------------------------------------------------|----|
| Surface Water Resource Maps | 27 |
| Well Maps | 27 |
| Findings | 27 |
| OPERATION PLAN | |
| Topsoil and Subsoil | 27 |
| Analysis | 27 |
| Soil Removal | 28 |
| Soil Salvage | 28 |
| Appendix 2-5 | 28 |
| Findings | 29 |
| FISH AND WILDLIFE INFORMATION | |
| Analysis | 29 |
| Protection and Enhancement Plan | 29 |
| Endangered and Threatened Species | 30 |
| Bald and Golden Eagles | 30 |
| Wetlands and Habitats of Unusually High Value for Fish & Wildlife | 30 |
| Findings | 31 |
| MINING OPERATIONS AND FACILITIES | |
| Analysis | 31 |
| Type and Method of Mining Operations | 31 |
| Facilities and Structures | 33 |
| Findings | 33 |
| EXISTING STRUCTURES | |
| Analysis | 33 |
| Findings | 34 |
| RELOCATION OR USE OF PUBLIC ROADS | |
| Analysis | 34 |
| Findings | 35 |
| COAL RECOVERY | |
| Analysis | 35 |
| Findings | 36 |
| SUBSIDENCE CONTROL PLAN | |
| Analysis | 36 |
| Renewable Resources Survey | 36 |
| Subsidence Control Plan | 37 |
| Mining Methods | 37 |
| Physical Conditions Affecting Subsidence | 37 |
| Subsidence Control Measures | 38 |
| Subsidence Monitoring | 38 |
| Performance Standards for Subsidence Control | 40 |
| Renewable Resources Survey | 40 |
| Subsidence Control Plan | 40 |
| Performance Standards for Subsidence Control | 40 |
| SLIDES AND OTHER DAMAGE | |
| Analysis | 41 |
| Findings | 41 |

ROAD SYSTEMS & OTHER TRANSPORTATION FACILITIES

| | |
|---------------------------------|----|
| Analysis | 41 |
| Road Systems | 41 |
| Plans and Drawings | 41 |
| Road Specifications | 42 |
| Road Surfacing | 43 |
| Slope Stability | 44 |
| Road Alignment | 44 |
| Road Surfacing | 45 |
| Road Maintenance | 45 |
| Road Culverts | 45 |
| Performance Standards | 46 |
| Primary Road Certification | 46 |
| Other Transportation Facilities | 47 |
| Findings | 47 |
| Road Classification Systems | 47 |
| Plans and Drawings | 47 |
| Performance Standards | 47 |
| Primary Road Certification | 47 |
| Other Transportation Facilities | 47 |

SPOIL AND WASTE MATERIALS

| | |
|-------------------------------------------------------------------|----|
| Analysis | 48 |
| Noncoal Waste | 48 |
| Coal Mine Waste | 49 |
| Refuse Piles | 49 |
| Impounding Structures | 50 |
| Foundation Considerations | 50 |
| Slope Protection | 51 |
| Embankment Faces | 51 |
| Highwalls | 51 |
| MSHA Criteria | 51 |
| Pond Operation and Maintenance Plans | 52 |
| Burning and Burned Waste Utilization | 53 |
| Return of Coal Processing Waste to Abandoned Underground Workings | 53 |
| Excess Soil | 53 |
| Findings | 53 |

HYDROLOGIC INFORMATION

| | |
|---------------------------------------------------|----|
| Analysis | 54 |
| Discharges into an Underground Mine | 54 |
| Impoundments | 55 |
| Ponds, Impoundments, Banks, Dams, and Embankments | 57 |
| Findings | 57 |

SUPPORTS FACILITIES AND UTILITY INSTALLATIONS

| | |
|------------------------------------|----|
| Analysis | 58 |
| Supports Facilities | 58 |
| Water Pollution Control Facilities | 58 |
| Findings | 59 |

| | |
|-----------------------------------------------------------------------|----|
| SIGNS AND MARKERS | |
| Analysis | 59 |
| Mine and Permit Identification Signs | 59 |
| Perimeter Markers | 59 |
| Buffer Zone Markers | 60 |
| Topsoil Markers | 60 |
| Findings | 60 |
| USE OF EXPLOSIVES | |
| Analysis | 60 |
| Findings | 61 |
| MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS | |
| Analysis | 61 |
| Certification | 61 |
| Findings | 61 |
| OPERATIONAL HYDROLOGIC INFORMATION | |
| Analysis/Findings | |
| Surface Water Monitoring | 62 |
| Discharges into an Underground Mine | 62 |
| Gravity Discharges | 63 |
| Water-Quality Standards and Effluent Limitations | 63 |
| Diversions | 63 |
| Stream Buffer Zones | 64 |
| Sediment Control Measures | 65 |
| Sedimentation Ponds | 65 |
| Exemptions for Siltation Structures | 65 |
| Discharge Structures | 66 |
| Impoundments | 66 |
| RECLAMATION PLAN | |
| POSTMINING LAND USES | |
| Analysis | 67 |
| Findings | 67 |
| PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES | |
| Analysis | 67 |
| CONTEMPORANEOUS RECLAMATION | |
| Analysis | 68 |
| Findings | 68 |
| REVEGETATION | |
| Analysis | 68 |
| General Requirements | 68 |
| Timing | 70 |
| Mulching and Other Soil Stabilizing Practices | 70 |
| Standards for Success | 70 |
| Findings | 71 |

| | |
|-----------------------------------------------------------|----|
| TOPSOIL AND SUBSOIL | |
| Analysis | 71 |
| Soil Borrow | 71 |
| Findings | 71 |
| APPROXIMATE ORIGINAL CONTOUR RESTORATION | |
| Analysis | 72 |
| Findings | 73 |
| BACKFILLING AND GRADING | |
| Analysis | 73 |
| General | 73 |
| Exposed Coal Seams | 77 |
| Acid and Toxic Forming Materials | 77 |
| Combustible Materials | 77 |
| Cut and Fill Terraces | 78 |
| Highwalls From Previously Mined Areas | 78 |
| Previously Mined Areas | 79 |
| Backfilling and Grading- Thin Overburden | 79 |
| Backfilling and Grading- Thick Overburden | 80 |
| Regrading of Settled and Revegetated Fills | 80 |
| Findings | 81 |
| MINE OPENINGS | |
| Analysis | 82 |
| Findings | 83 |
| ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES | |
| Analysis | 83 |
| Findings | 84 |
| HYDROLOGIC INFORMATION | |
| Analysis | 84 |
| Sedimentation Ponds | 84 |
| Impoundments | 85 |
| Casing and Sealing of Wells | 85 |
| Findings | 85 |
| CESSATION OF OPERATIONS | |
| Analysis | 85 |
| Commitment | 86 |
| Surface Coal Mining and Reclamation Activities | 86 |
| Underground Coal Mining and Reclamation Activities | 86 |
| Environmental Protection Performance Standards | 86 |
| Findings | 87 |
| MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS | |
| Analysis | 87 |
| Affected Area Boundary Maps | 87 |
| Bounded Area Map | 87 |
| Reclamation Backfilling and Grading Maps | 87 |
| Reclamation Facilities Maps | 87 |
| Final Surface Configuration Maps | 88 |

| | |
|--------------------------------------------------------------------|----|
| Reclamation Surface and Subsurface Manmade Features Maps | 88 |
| Findings | 88 |
| BONDING AND INSURANCE REQUIREMENTS | |
| Analysis | 88 |
| Findings | 89 |
| RECLAMATION HYDROLOGIC INFORMATION | |
| Analysis/Findings | |
| Surface Water Monitoring | 89 |
| Discharges into an Underground Mine | 90 |
| Gravity Discharges | 90 |
| Water Quality Standards and Effluent Limitations | 90 |
| Diversions | 91 |
| Stream Buffer Zones | 91 |
| Sediment Control Measures | 91 |
| Sedimentation Ponds | 92 |
| Exemptions for Siltation Structures | 92 |
| Findings | 92 |

INTRODUCTION

This Technical Analysis (TA) is written as part of the permit review process. It documents the Findings that the Division has made to date regarding the application for a permit and is the basis for permitting decisions with regard to the application. The TA is broken down into logical section headings which comprise the necessary components of an application. Each section is analyzed and specific findings are then provided which indicate whether or not the application is in compliance with the requirements.

Often the first technical review of an application finds that the application contains some deficiencies. The deficiencies are discussed in the body of the TA and are identified by a regulatory reference which describes the minimum requirements. In this Technical Analysis we have summarized the deficiencies at the beginning of the document to aid in responding to them. Once all of the deficiencies have been adequately addressed, the TA will be considered final for the permitting action.

It may be that not every topic or regulatory requirement is discussed in this version of the TA. Generally only those sections are analyzed that pertain to a particular permitting action. TA's may have been completed previously and the revised information has not altered the original findings. Those sections that are not discussed in this document are generally considered to be in compliance.

SUMMARY OF DEFICIENCIES

- R645-301-521.122**, show the existing power lines that cross the proposed permit area on maps. In the Text the Applicant states that they depict a power line on Plates 4-1 and 5-2A but no power line is shown on either map. The Applicant needs to either correct the text or update the plates.
- R645-301-521.150 and R645-301-521.151**, give the Division a contour map that adequately represents the existing land surface and which has the contours extend 100 feet beyond the disturbed area boundary.
- R645-301-220**, Additional soil pits are needed to more accurately access and optimize soil salvage. These include: (1) Additional soil-test pits are needed in the water tank area, and (2) if disturbance is going to occur in the Rock outcrop-Rubbleland-Travessilla #96-soils on hillsides immediately northwest of the facilities area, then the specific soil survey needs to include soil-test pits in these currently undisturbed areas.
- R645-301-321**, the vegetation resource information provided does not seem to accurately describe the permit area and proposed disturbed area as represented by the vegetative communities which are shown on Plate 3-1. The current plan describes a much broader area than the proposed permit area. The unneeded information makes the resource information confusing and not correct and must be removed and/or corrected.
- R645-301-322.210**, a letter from Robert Thompson, 1995, is said to be in Appendix 3-1 stating a negative finding of threatened and endangered plant species within the permit area. No letter could be found in Appendix 3-1. The permit must document that the area has been searched for threatened and endangered plant species. A site specific survey must be made and documented in the permit for the presence of the sensitive species Canyon sweetvetch.
- R645-301-322.220**, the plan fails to adequately identify habitats of unusually high value for fish and wildlife such as critical deer summer and winter range, cliff escarpments and important riparian habitat.
- R645-301-322.220**, no information was provide on the presence or potential habitat for bats in the area of disturbance by facilities or subsidence. Prior to site disturbing activities cliff or escarpment areas surrounding the facilities areas must be surveyed for the presence of bats by a qualified person. The permit must commit to conducting survey prior to any cliff disturbing planned subsidence. A map showing all areas of cliff escarpments within the permit area must be provided in the permit.
- R645-301-411**, the map which shows the areas of past logging is nearly illegible and no permit boundary shown, this must be corrected. The map of logging should not be included within the Historic and Cultural Resource report.
- R645-301-121.200, -622.100**, The locations where the coal, roof, and floor samples were collected for the Gilson seam are not identified in the MRP.

R645-301-624.210, -722.100, Ground water occurrence is not indicated on logs in Appendix 6-1, nor anywhere else in the PAP.

R645-300-124.300, Information for which confidentiality has been requested has not been submitted separate from the rest of the PAP in a folder or binder marked "Confidential".

R645-301-522, -622.200, -623.300, -625, Isopach maps of coal thickness are needed to evaluate the subsidence control plan and to evaluate maximization of coal recovery.

R645-301-232, All topsoil and subsoil will be removed from the area to be disturbed and where topsoil is of insufficient quantity, materials approved by the Division in accordance with R645-301-233.100 will be removed and salvaged from the area. Since topsoil is of insufficient quantity, soil salvage will not only include undisturbed soils (TS and #96), but also previously disturbed soils, overburden material and subsoils.

The Division requests that a non-biased, third party, professional soil scientist be on-site during soil salvage to monitor and supervise soil salvage operations for the purpose of maximizing soil salvage volumes and quality.

R645-301-120 and R645-301-130, Appendix 2-5 includes soil recovery calculations. However, not all calculations include surface area and soil depth amounts. In order to correctly appraise soil recovery calculations, all calculations need surface area and soil depth amounts.

R645-301-333, the plan has stated the methods used in wildlife protection however, no plan is given for enhancement of critical resources and how this will be achieved.

R645-301-358.200, the plan must qualify the statement that any nesting raptor nests will be covered to prevent habitation in the case of potential subsidence. This method may possibly be used, but only after the Division has consulted with DWR and USFW and identified whether and under what conditions the operator may proceed. The stated period of nest avoidance must be corrected to reflect actual protection periods.

R645-301-333, power line construction information within the permit is contradictory and must state that all power lines within the disturbed area will be raptor safe.

R645-301-121.200, clear and concise description of the existing transmission lines.

R645-301-526.110, list and describe the existing dirt roads in the permit area.

R645-301-522, The Applicant must supply the Division with details about the coal recovery plan.

R645-301-527.100, classify all the roads in the permit area. The Applicant did not classify the private dirt roads in the permit area.

R645-301-512.200. The Applicant needs to provide cross section for each of the private dirt roads. The cross sections must show that the dirt roads met the performance standards.

- R645-301-521.170**, provide a detailed description of the conveyor system used to transport coal from the portals to the coal stockpiles.
- R645-301-528.331**, The Applicant must designate those portions of the permit area where non-coal waste will be disposed.
- R645-301-528.321**, have an MSHA approved plan to return coal mine waste to underground disposal areas.
- R645-301-536.510**, have the disposal facilities at Skyline and SUFCO permitted to accept coal mine waste from off-site sources.
- R645-301-121.200**, state in a clear and concise manner how the temporary refuse pile would be operated.
- R645-301-533.300**, show that the sediment pond embankment would be stable when rapid drawdown occurs.
- R645-301-528.323**, The Applicant must address the procedures for handling coal mine waste fires.
- R645-301-533.300**, demonstrate that the pond would be stable under rapid drawdown.
- R645-301-533.700**, provide the Division with certified written specification for the sediment pond.
- R645-301-521.241**, The Applicant needs to place permit identification signs at all entrances to the disturbed areas.
- R645-301-356**, the permit is not clear as to what vegetation success standards will be met at the time of bond release. The application must clearly state which success standards will be used for bond release purposes. A method to demonstrate that the site has a diverse vegetative cover must be proposed.
- R645-301-232.720**, The MRP shows a deficit of soil material will exist during reclamation and therefore, the MRP must identify soil borrow for making up the soil deficit. Soil replacement volumes need to be much greater than 3.6 inches and should approach an average 16 to 18 inches. Soil borrow will require locating a soil borrow area and providing all the regulatory information associated with soil borrow, including soil resource information.
- R645-301-121.200**, delete reference to an AOC variance that they did not apply for nor was granted by the Division.
- R645-301-553.120**, meet the exclusion requirements of R645-301-555.610.
- R645-301-553.300**, meet the requirements of R645-301-542.200 by committing to cover all exposed coal seams in the disturbed area with at least 4 feet of material.
- R645-310-553.400**, prove that terraces are needed for the postmining land use.

R645-301-553.500, if the preexisting highwalls are to be eliminated the Applicant must demonstrate that the reclaimed highwalls are stable and compatible with the postmining land use.

R645-301-553.600 and R645-301-553.650, show that all reasonably available fill would be used to reclaim the highwalls and that the remaining will be stable and compatible with the postmining land use.

R645-301-121.300, clearly state if they would regrade any settled and revegetated fill.

R645-301-553.250, commit to disposing of refuse only at sites that have been approved to accept material from the Dugout Canyon Mine.

R645-301-553.500 and R645-301-533.600, demonstrate that the preexisting highwalls would be eliminated or that there is insufficient spoil to reclaim the highwalls completely

R645-301-527.110, classify each road in the permit area as a primary or ancillary road.

R645-301-542.600, state how they would reclaim the private dirt roads in the permit area.

R645-301-527.200, describe how they will maintain the permanent roads in the disturbed area.

R645-301-551, address how monitoring wells would be sealed.

R645-301-830, The Applicant must give the Division detailed earthwork cost estimates.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR Sec. 783.,
et. al.

GENERAL

Regulatory Reference: 30 CFR Sec. 783.12; R645-301-411, -301-521, -301-721.

Analysis:

The environmental resource information required in Section R645-301-521 pertains to land subject to surface coal mining operations. A detailed analysis of those requirements will be done in the permit area subsection of the environmental resource section of the TA.

Findings:

The environmental resource information required in Section R645-301-521 pertains to land subject to surface coal mining operations. A detailed analysis of those requirements will be done in the permit area subsection of the environmental resource section of the TA.

PERMIT AREA

Regulatory Requirements: 30 CFR Sec. 783.12; R645-301-521.

Analysis:

Surface ownership for permit area and adjacent lands are shown on Figure 1-1. Figure 1-2 shows coal ownership in and around the permit area. The permit boundary contains all of lease ML-42648 and the S1/2SE1/4 of Section 9 from lease ML-42649. The disturbed area boundary encompasses 9.1 acres. That acreage includes a road belonging to Carbon County. The area of the road is 0.85 acres.

The legal descriptions for the lease areas are given in Appendix 1-4 and in Section 114 Right-of-Entry Information. The leases are described as:

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Lease ML-42648 - (3640 acres) - Approved

T. 13 S., R. 12 E., SLBM, Utah

Section 8: E1/2

Section 10: S1/2

Section 11: S1/2

Sections 14 and 15: All

Section 17: NE1/4; E1/2SW1/4; SE1/4

Section 20: E1/2NW1/4; SW1/4NW1/4; N1/2NE1/4

Section 21: N1/2NW1/4; NE1/4

Section 22: N1/2; N1/2S1/2

Section 23: W1/2NW1/4

Lease ML-42649 - (2212 acres) - Approved

T. 13 S., R. 12 E., SLBM, Utah

Section 3: Lots 1, 2, 3, 4, S1/2 (all)

Section 4: Lots 1, 2, 3, 4, S1/2 (all)

Section 5: Lots 1, 2, SE1/4

Section 9: All

Section 10: N1/2

Section 11: N1/2

Fee land owned by Soldier Creek Coal Company (800 acres) as described below:

T. 13 S., R. 12 E., SLBM, Utah

Section 16: All

Section 23: E1/2NW1/4; W1/2NE1/4

The permit area is also shown other plate. Plate 5-5 shows the proposed permit boundaries and was certified by a professional engineer.

Findings:

The Applicant has met the minimum requirement for describing the proposed permit area for the first five years.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Analysis:

Affected Area Boundary Maps

The Applicant has met the requirements of R645-301-521.141 by giving the Division with Plate 5-5 that clearly shows the boundaries of all areas proposed to be affected over the estimated total life of the coal mining and reclamation operations.

In Section 523 of the PAP the Applicant states that they schedule mining to begin in 1998. The dates on Plate 5-5 show that the Applicant hopes to mine until 2025. Not all the proposed mining areas are in the proposed permit area. The Applicant wants to learn the mining conditions before permitting total proposed area. The Division understands the Applicant cannot determine that mining condition until production begins. The Division will allow the Applicant to permit part of the life-of-mine area at this time. If the Applicant wants to expand the permit area he can do so later.

Existing Structures and Facilities Maps

The Applicant failed to met the requirements of R645-301-521.122 by not showing the location of the existing powerline on any maps.

In Section 521.100 of the PAP the Applicant states:

"No buildings are located in and within 1000 feet of the permit area. No transmission lines, pipelines, or agricultural drainage tile fields exist within, passing through, or passing over the proposed permit area. Hence, they do not provide a map of these nonexistent facilities in accordance with R645-301-521.123 and R645-301-124.

An existing county road enters the permit area in the NE1/4, SE1/4 Sec. 22, T. 13 S., R. 12 E., extending within that section for approximately 500 feet within the permit area. The road then exits the permit area for approximately 1300 feet of road length, then reenters the permit area in the SW1/4 NW1/4 Section 23, where it ends at the southern edge of the proposed disturbed area boundary. The county road lies on land either owned by the State of Utah or the United States of America. Other existing roads within the disturbed area and permit area are privately owned and maintained roads (see Plate 4-1). The general locations of roads within and adjacent to the permit area are shown on

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Plate 5-5.

Some debris remains within the disturbed area from previous mining operations. That which cannot be salvaged will be disposed of during the construction of the mining facilities. The final disposal location will be determined by the nature of the debris. All debris will be handled in accordance with applicable Federal, State and local regulations.

Plates 4-1 and 5-2A depict the location of an existing UP&L distribution line that will be improved and activated to provide electrical service to the mine. This distribution line will be owned and upgraded by UP&L."

The Applicant does not show the powerline on Plate 4-1 or Plate 5-2A. The Applicant needs to show the location of the existing powerline because it is an existing structure.

All structures and facilities not shown on an existing surface and facilities map will be considered part of the current mining operation and reclaimed to Title V standards.

A major reason for requiring the Applicant to provide maps of the existing surface structures and facilities is to determine reclamation responsibilities. The Applicant is not responsible to existing structures and facilities that are not used in their mining or reclamation operations. The Applicant assumes responsibility for reclaiming all existing structures and facilities. The Applicant does not need a detailed map of the existing structures and facilities.

Existing Surface Configuration Maps

Plate 5-2A does not meet the requirements of R645-301-521.151 because it does not show the contour 100 linear feet above and below the disturbed area.

Plate 5-2A does not meet the requirements of R645-301-521.150 because the plate does not show the existing topography.

In Section 521, Land Surface Configuration the Applicant states:

"Surface contours of undisturbed areas adjacent to proposed disturbed areas associated with the mine are shown on Plate 5-2A. As stated in Section 512.100 of this M&RP, surface facilities have been in existence on the west side of Dugout Canyon since March 1952. As a result, pre-mining topographic maps do not exist. However, the surface contours in undisturbed areas shown on Plate 5-2A are considered generally indicative of original land slopes in the vicinity of the mine."

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

R645-301-521.150, requires an applicant to submit maps that clearly show the existing topography of the disturbed area. Existing topography means the surface configuration as it existed prior issuance of a coal mining permit. Plate 5-2A does not meet the requirements of R645-301-521.150 because the plate does not show the existing topography of the proposed disturbed area.

Plate 5-1 does not meet the requirements of R645-301-521.150 because it does not adequately represent the existing topography.

Plate 5-1 shows the contours in and around the disturbed area but the Applicant did not survey it in with sufficient accuracy to be useful to the Division. The scale of Plate 5-1 is 1 to 1,000. The Division needs a map to have a scale of not less than 1 inch equals 50 feet.

Mine Workings Maps

Plate 5-1 meets the requirements of R645-301-521.111.

Plate 5-1 shows the location of the mine workings that existed before the Division issued the permit. Plate 5-1 shows the Pre-SMCRA mine workings in the Rock Canyon and Gilson seams and the old mine openings. Richard White certified plate 5-1.

Permit Area Boundary Maps

Figure 1-1, Figure 1-2 and Plate 5-2A met the requirements of R645-301-521.131, R645-301-521.132 and R645-301-521.141.

Figure 1-1 and Figure 1-2 are in Chapter 1 of the PAP. They show the surface and coal ownership. The Applicant show the legal descriptions of the fee land, coal and coal leases in Chapter 1 of the PAP. Plate 5-2A shows the permit boundary for the first five years and the life-of-mine area.

Surface and Subsurface Ownership Maps

Figure 1-1 and Figure 1-2 met the requirements of R645-301-521.131 and R645-301-521.132.

Figure 1-1 and Figure 1-2 are in Chapter 1 of the PAP. They show the surface and coal ownership. The Applicant show the legal descriptions of the fee land, coal and coal leases in Chapter 1 of the PAP.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Findings:

Affected Area Boundary Maps

The Applicant met the minimum requirements of R645-301-521.141 by providing a map that shows the affected area boundaries.

Existing Structures and Facilities Map

The Permittee has not met the requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-521.122, show the existing power lines that cross the proposed permit area on maps. In the Text the Applicant states that they depict a powerline on Plates 4-1 and 5-2A but no powerline is shown on either map. The Applicant needs to either correct the text or update the plates.

Existing Surface Configuration Maps

The Applicant failed to meet the requirements of R645-301-521.150 and R645-301-521.151. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-521.150 and R645-301-521.151: give the Division a contour map that adequately represents the existing land surface and which has the contours extend 100 feet beyond the disturbed area boundary.

Mine Working Maps

The Applicant met the requirements of R645-301-521.111. Plate 5-1 shows the location of the mine working that exist before the issuance of the SMCRA permit.

Permit Area Boundary Maps

The Applicant met the requirements of R645-301-521.131, R645-301-521.132 and R645-301-521.141 by giving the Division copies of Figure 1-1, Figure 1-2, and Plate 5-2A that show the permit boundaries.

Surface and Subsurface Ownership Maps

The Applicant met the requirements of R645-301-521.131 and R645-301-521.132 by

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

supplying the Division with a copy of Figure 1-1 and Figure 1-2.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.21, 817.200(c); R645-301-220, -301-411.

Analysis:

The Response to Deficiency submittal did not satisfactorily address the following deficiencies:

- Soil Survey - Additional soil-test pits are needed in the water tank and pump house area.

Soil Survey - Additional soil-test pits are needed in the water tank and pump house area.

Additional soil-test pits are needed in the water tank area, to sample both the OB and TS soils. In addition, if disturbance is going to occur in the Rock outcrop-Rubbleland-Travessilla #96-soils on hillsides immediately northwest of the facilities area, then the specific soil survey needs to include soil-test pits in these currently undisturbed areas. These additional sample pits are needed to more accurately access and optimize soil salvage supplying background data for soil depth and characteristics.

Findings:

The permittee must provide the following, prior to approval, in accordance with the requirements of:

- R645-301-220**, Additional soil pits are needed to more accurately access and optimize soil salvage. These include: (1) Additional soil-test pits are needed in the water tank area, and (2) if disturbance is going to occur in the Rock outcrop-Rubbleland-Travessilla #96-soils on hillsides immediately northwest of the facilities area, then the specific soil survey needs to include soil-test pits in these currently undisturbed areas.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.12; R645-301-411.

Analysis:

Appendix 4-1 of the permit provides a Cultural Resource Evaluation of the Dugout Canyon Mine. An intensive archeological surface evaluation of the Dugout Canyon Mine area was conducted in 1980 under the direction of Eureka Energy Company by Archeological-Environmental Research Corporation (AERC). Four of the sites reported as possible nominations are in the area of the current proposed mine. The four sites include one prehistoric rock art locus (42CB 92) and three historic coal mine loci: The Dugout Creek Mine (42CB 2005/291), the Fish Creek Mine (42CB 204/290) and the Pace Canyon Mine (42CB 206/292/574). The Fish Creek Mine and the Pace Canyon Mine were subsequently determined to not be eligible for nomination to the National Register of Historic Places (NRHP).

Files at the State Historic Preservation Office, Bureau of Land Management Office, and records of the NRHP were consulted. Further field evaluations were conducted by AERC on the prehistoric rock art and the Dugout Creek Mine in November 1995. In this study the Dugout Creek Mine was determined not eligible for inclusion on the NRHP due to the lack of context and cultural integrity.

Findings:

Information provided in the plan meets the minimum requirements of this section.

VEGETATION RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.19; R645-301-320.

Analysis:

Numerous vegetative communities are represented within the proposed permit area. The permit area ranges in elevation from 7000 feet to 8600 feet. The permit describes the plant communities as having been heavily impacted from man's activities throughout the years. Baseline sampling has occurred in 7 of the eleven communities within the permit area in 1980 and 1981. The permit area vegetation map (Plate 3-1) does not designate eleven plant communities within the permit area as stated in the text. The permit describes vegetative cover, production and shrub density of those plant communities which were sampled. Several

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

of the described sampled communities are not within the permit area and the descriptions and supporting data should be removed from the text and appendix.

The deciduous streambank community occurs within the proposed area to be disturbed. Generally this community consists of deciduous trees and shrubs such as narrowleaf cottonwood, Rocky Mountain maple and Douglas Fir. The understory is occupied largely by shrubs due to past grazing pressures on the grasses and forbs. Productivity of the understory in this community was measured at 912 pounds per acre in 1980. In 1991 this community was described in fair to poor range condition by the Bureau of Land Management. A site visit in 1996 suggested that this area had not been as heavily grazed as reported in the past but still in a somewhat degraded condition. This community type is the most productive in terms of forage availability in the area.

The area of proposed disturbance is described as once dominated by sagebrush/grass with a potential forage production of 1400 pounds per acre. A pinyon/juniper community surrounds the area of proposed disturbance. The proposed disturbed area was sampled in 1996. This area had been disturbed by past mining and coal exploration activities. The dominant shrub species by cover was big-toothed maple while rubber rabbitbrush had the greatest number of individuals present. The area is dominated by species which indicate the site has been disturbed. Yellow sweetclover contributed the most vegetative cover to the total cover of 37 percent (Appendix 3-1).

A review of literature and field studies for the area indicate no threatened or endangered plant species are present in the area or likely to be present (Section 322.200). Field studies were conducted 1979 through 1984. A letter from Robert Thompson, 1995, is stated to be in Appendix 3-1 stating a negative finding of threatened and endangered plant species. No letter could be found in Appendix 3-1. The permit fails to comment on the potential presence of the listed sensitive species Canyon Sweetvetch. Canyon Sweetvetch is likely present and populations of this species should be documented. A site specific search should be made of the area within the proposed disturbed area.

Findings:

Information provided in the application does not meet the minimum requirements of this section. Prior to approval, the Permittee must provide the following in accordance with:

R645-301-321, the vegetation resource information provided does not seem to accurately describe the permit area and proposed disturbed area as represented by the vegetative communities which are shown on Plate 3-1. The current plan describes a much broader area than the proposed permit area. The unneeded information makes the resource information confusing and not correct and must

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

be removed and/or corrected.

R645-301-322.210, a letter from Robert Thompson, 1995, is said to be in Appendix 3-1 stating a negative finding of threatened and endangered plant species within the permit area. No letter could be found in Appendix 3-1. The permit must document that the area has been searched for threatened and endangered plant species. A site specific survey must be made and documented in the permit for the presence of the sensitive species Canyon sweetvetch.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.21; R645-301-322.

Analysis:

A Fish and wildlife resource survey was conducted December 1979 through November 1981 for the proposed Sage Point - Dugout Canyon coal mining project (Appendix 3-3). Wildlife count data were collected along eight experimental and four control transects through four different vegetation types: riparian, desert scrub, Pinyon-juniper and conifer-bush. Each transect monitored reptiles, non-game birds, big game, medium sized mammals and small mammals. Upland and migratory game birds were not documented in this study due to their low frequency of occurrence in the survey area. A limited number of species of macroinvertebrates were found in 1979 and since the creek is not a fishery resource further studies were not conducted.

Detailed information such as numbers and species presence was collected in these studies within the then proposed permit area in 1979 through 1981. All though this study has provided valuable site species information these data should not be considered as baseline information in 1996. The current designated permit area and facilities area is much smaller then the earlier proposed design. The study was designed to monitor the effects of coal mine development on wildlife and not a baseline description.

Wildlife Plate 3-2 designates the disturbed area as Mule Deer Critical Summer Range. DWR states (letter dated April, 1996) that much of the area is classified as critical deer winter range and is heavily used by deer and occasionally by elk and antelope. Mule deer in the area are considered part of Herd Unit 32 and the elk as part of Herd Unit 24. Designated critical range and/or any riparian areas are considered high value habitats for wildlife.

Section 322.200, Site-specific Resource Information, states that no threatened or endangered plant and wildlife species were discovered in recent inventories by DWR, Forest Service and qualified personnel. Three listed species (black-footed ferret, bald eagle, and

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

peregrine falcon) could potentially inhabit the area. The peregrine falcon has been observed in several recent surveys of the Carbon County area. No confirmed sightings of black-footed ferrets have occurred within Carbon County during 1995, 1996, and the first quarter of 1997 (Bill Bates, UDWR, Section 322.200).

A raptor nest survey was conducted by the DWR in 1995. The nest locations identified in that survey are shown on Plate 3-2. No raptor nests are within the area to be disturbed by facility construction, although a golden eagle is frequently sighted soaring at the cliff edge in full view of the proposed facilities. Since bird nest surveys can change from year to year, the permit should be stipulated with the condition that prior to any site disturbing activities an on the ground nest survey must be conducted for all raptors and bird species of special interest.

No information was provided on the presence of bats in the area. Prior to site disturbing activities, cliff or escarpment areas surrounding the facilities areas should be surveyed for the presence of bats. The permit should also commit to conducting surveys prior to any cliff disturbing planned subsidence. Prior to permit approval, a map must be included in the permit detailing the location of all cliff escarpments, if any, within the permit area.

Findings:

Information regarding the requirements of this section is not considered to be complete at this time. Additional information must be provided by the permittee in order for the Division to approve all the requirements of this section.

R645-301-322.220, the plan fails to adequately identify habitats of unusually high value for fish and wildlife such as critical deer summer and winter range, cliff escarpments and important riparian habitat.

R645-301-322.220, no information was provided on the presence or potential habitat for bats in the area of disturbance by facilities or subsidence. Prior to site disturbing activities cliff or escarpment areas surrounding the facilities areas must be surveyed for the presence of bats by a qualified person. The permit must commit to conducting survey prior to any cliff disturbing planned subsidence. A map showing all areas of cliff escarpments within the permit area must be provided in the permit.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

LAND-USE RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.22; R645-301-411.

Analysis:

Land use resource information is given in Chapter 4 of the plan. The stated premining landuse for the permit area is rangeland for cattle and sheep grazing and wildlife habitat. The land has not been developed nor improved for these uses. Recreational use of the permit area is limited due to lack of access through private property. Carbon County has zoned the permit area for mining and grazing (Section 4.11.120). A logging operation was conducted within the permit area in 1996 as shown on a map in Appendix 4-1, Exhibit A, as part of the cultural and historic resource information. This map is nearly illegible with no permit boundary shown. The map must not be included within the historic and cultural resource report. Cascade Resources, logging contractor, reported harvesting six million board feet from the areas shown in Exhibit A.

Current productivity of the land surrounding the proposed disturbed area was estimated by George Cook, National Resources Conservation Service, on August 6, 1996 to be 1400 pounds per acre air dry herbage and in low good condition. Previous productivity statements about the Dugout Canyon showed the area to be severely overgrazed and degraded in the late 1970's and early 1980's. Currently the proposed disturbed area shows very little evidence of grazing.

Coal mining has occurred within Dugout Canyon since 1925. The Red Glow Mine on the east side of Dugout Canyon was hand-developed by D. J. Collins in 1925. The Rock Canyon seam on the west side of Dugout Canyon was first mined in 1952 by E.S.O. Coal Company. The Knight Ideal Coal Company mined the Rock Canyon and Gilson coal seams between 1958 and 1964. They extracted approximately 1,326,000 tons of coal in that period. No coal has been extracted since 1964, although the portals have been opened and explored several times since then.

Fish Creek and Pace Canyon Mines which operated in the early 1900's are also located within the permit area.

Findings:

Information regarding land use classification does not meet the minimum regulatory requirements of this section. Additional information must be provided by the permittee in order for the Division to review and approve all the requirements of this section.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

R645-301-411, the map which shows the areas of past logging is nearly illegible and no permit boundary shown, this must be corrected. The map of logging should not be included within the Historic and Cultural Resource report.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.22; R645-301-623, -301-724.

Analysis:

Geologic information includes a description of the geology of the proposed permit and adjacent areas down to and including the stratum immediately below the lowest coal seam to be mined and the aquifer below the lowest coal seam to be mined that may be adversely impacted by mining. This description includes the areal and structural geology of the permit and adjacent areas, and other parameters that influence the required reclamation. It also shows how areal and structural geology may affect the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground water. The description is based on maps and plans required as resource information for the plan, detailed site specific information, and, geologic literature and practices.

Descriptions of the stratigraphy and lithology of strata from the Mancos Shale up to the Colton Formation and of Quaternary pediment gravels and alluvium are in Section 624.100. That section also contains a discussion of geologic structure and a very brief description of the nature, depth, and thickness of the coal seams and the interburden between the Sunnyside, Rock Canyon, and Gilson seams. Plate 6-4 is an isopach map of the Rock Canyon seam overburden thickness and Plate 6-5 is an isopach map of the Rock Canyon to Gilson seam interburden thickness.

Although the Gilson and Rock Canyon seams are both sufficiently developed to allow for economic mining in the proposed permit area, only the Rock Canyon seam is to be mined under the proposed MRP. Movable coal in the Rock Canyon seam ranges from five to eight feet in thickness (DCMRP p. 6-15). There are no isopach maps of the coal seams. Reference is made to an R2P2 for coal seam isopach maps (DCMRP p. 6-15), but because no Federal coal is involved in this proposed permit the R2P2 for adjacent areas may not provide needed information.

Appendix 6-1 contains cutting and core logs for drill holes 3-1, 9-1, 9-2, 10-1, 11-1, 13-1, 13-2, 14-1, 15-1, 15-2, 15-3, 19-2, HCC-4 (H-4), KCC-A and KCC-E. Collar or ground elevations are included in Appendix 6-1. Drill hole locations and elevations are shown on Plate 6-1.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Some bore holes have been logged from the surface to total depth, for others only the coal seams and adjacent strata have been logged. Together, the logs describe lithologic characteristics and thickness of each stratum from the surface to below the coal seams. Ground water occurrence is not indicated on these logs. Bore hole logs were used to construct the cross sections on Plate 6-3, which show the interval from the Sunnyside coal zone to below the Gilson coal zone. Figure 6-1 is a more general cross section from the surface to the Mancos Shale.

Analysis reports on coal, floor, and roof samples from the Rock Canyon and Gilson seams are found in Appendix 6-2. Floor and roof samples of the Rock Canyon seam were collected from one of the portals of the abandoned Rock Canyon seam mine in Dugout Canyon (portals shown on DCMRP Plate 5-1) and a sample of coal was taken from a fresh coal outcrop located a few-hundred feet inside. The locations where the coal, roof, and floor samples were collected for the Gilson seam are not identified in the MRP; because the Gilson seam is not to be mined under the proposed MRP this information is not required for permit approval, but it should be provided for clarity.

Samples were analyzed for acid- or toxic-forming and alkalinity-producing materials, including total sulfur but not pyritic or other specific forms of sulfur. BTU, ash, and sulfur content of the Rock Canyon coal are briefly summarized at the end of Section 624.100. No unacceptable values were reported for the parameters listed in Table 2 of UDOGM's "Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining".

Limited topsoil will be available for reclamation, so selected overburden materials are planned for use as topsoil supplements during reclamation. The MRP contains a commitment (DCMRP p. 2-22 and 2-23) that where overburden materials are used to supplement topsoil, they will be used only after it has been demonstrated that the resultant soil is suitable for supporting revegetation.

Data from one location are probably insufficient to determine the potential for acid- and toxic-forming materials for the entire proposed mine. Information in the PAP on potentially acid- and toxic-forming materials is insufficient. Additional testing is needed to determine whether reclamation as required by R645-301 and R645-302 can be accomplished. (Although not part of this permit submittal, future development of a waste-rock disposal site has been contemplated.) Data from the adjacent Soldier Creek Mine and other operations in the Book Cliffs may be available to augment the determination of the potential for acid- and toxic-forming or alkalinity-producing material.

Clay content was determined for the roof and floor rock samples. The sample from the roof of the Gilson seam contained twenty percent clay, but clay content of the other roof and

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

two floor samples was less than ten percent. Drill-hole logs indicate lithology of strata immediately above and below the minable coal varies within the permit and adjacent areas. Several factors, such as thickness of overburden, use of a 35° angle of draw in formulating the subsidence control plan, anticipation that most of the land within the permit area will eventually be affected by subsidence, and the low potential for material damage from subsidence, indicate additional determination of engineering properties of roof and floor rock would be of little value. No additional determinations of thickness and engineering properties of clays or soft rock are needed prior to approval of the proposed MRP.

Rock Canyon coal thickness in the proposed permit area ranges from 5 to 8 feet, except for a want, described as being in the north-central part of the proposed permit area, where coal thins to under three feet. Maximum subsidence can be projected as 3.5 to 5.6 feet, based on the assumption that the surface will subside up to 70% of the thickness of the extracted coal. Overburden thickness ranges from 600 feet in the south part of the proposed permit area to over 2400 in the north. Overburden consists of the upper Blackhawk Formation, the Castlegate Sandstone, and the Price River, North Horn, and Flagstaff Formations, which are described in Section 624.100. Gilson to Rock Canyon interburden thickness is 30 to 80 feet over most of the proposed permit area, and up to 100 feet at the west edge (Plate 6-5), and Rock Canyon to Sunnyside thickness is 140 to 180 feet.

The application includes geologic information in sufficient detail to assist in determining the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas, including the extent to which surface and ground water monitoring is necessary; and determining whether reclamation as required by the R645 Rules can be accomplished and whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.

At this time the Division does not require the collection, analysis, and description of additional geologic information to protect the hydrologic balance, to minimize or prevent subsidence, or to meet the performance standards.

The applicant has made no request the Division to waive in whole or in part the requirements of the bore hole information or analysis required of this section. However, the applicant has requested, within the text of the PAP, that the information in Appendices 6-1 and 6-2 be kept confidential. The Applicant should provide this information in a folder or binder separate from the rest of the PAP and marked "Confidential".

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Findings:

Information in the geologic resource section is not considered adequate to meet the requirements of this section. Prior to approval the applicant must provide the following in accordance with:

R645-301-121.200, -622.100, The locations where the coal, roof, and floor samples were collected for the Gilson seam are not identified in the MRP.

R645-301-624.210, -722.100, Ground water occurrence is not indicated on logs in Appendix 6-1, nor anywhere else in the PAP.

R645-300-124.300, Information for which confidentiality has been requested has not been submitted separate from the rest of the PAP in a folder or binder marked "Confidential".

R645-301-522, -622.200, -623.300, -625, Isopach maps of coal thickness are needed to evaluate the subsidence control plan and to evaluate maximization of coal recovery.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-720.

Analysis:

A potentiometric surface map for the Castlegate Sandstone is shown on Plate 7-3. The gradient is to the north, downdip. USGS data indicate that ground water flow in the Blackhawk-Starpoint aquifer also is to the north.

There appear to have been slow, long-term declines of hydraulic head measured in the Blackhawk Formation by monitoring wells GW-5-1 and GW-6-1, but when mining came within 150 feet and 2100 feet, respectively, of these wells in 1993 there was a slight rise of head followed by rapid declines. GW-32-1 has shown generally increasing water levels since monitoring began in 1990.

SCCC has concluded it is fruitless to attempt a map of the potentiometric surface of the Blackhawk Formation, using data from GW-5-1, GW-6-1, and GW-32-1, because of outcrops in Soldier Canyon. The nearest Blackhawk outcrop (Plate 6-1) is updip of and over a mile from the three wells, and there are no springs issuing from the Blackhawk Formation in Soldier Canyon or within several miles of the canyon. Mine workings have been

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

advanced from the outcrop in Soldier Canyon towards the locations of the monitoring wells since 1906, although most coal removal has been in the past 20 to 30 years. Based on data from GW-5-1, GW-6-1, and GW-32-1, SCCC has concluded that mining has had little or no effect on ground water levels in the Blackhawk Formation except very near the mine workings. Data in the MRP indicate an irregular potentiometric surface in the Blackhawk Formation near the Soldier Canyon Mine that is influenced by the outcrop of the Blackhawk Formation in nearby Soldier Canyon, the mine workings, and the lateral discontinuity of the strata. The non-uniformity of length and placement of screened zones within the strata affect data reliability or continuity (DCMRP p. 7-29).

Regional hydrostratigraphy from the Colton Formation down to the Mancos Shale is discussed in Section 724.100. Structural geology is discussed in Section 624.100. Ground water occurs in perched aquifer systems and in the regional system in the Blackhawk Formation and underlying Star Point Sandstone. These systems and ground water occurrence, including ground water in mines, are described and discussed in Section 724.100 and Appendix 7-3.

Sampling and analysis

Analysis:

Sampling and analysis is addressed on page 7-4, Section 723. This section states that analysis will be completed based on either "Standard Methods for the Examination of Water and Wastewater" or 40 CFR parts 136 and 434.

Findings:

The applicant has met the minimum requirements for surface-water sampling and analysis.

Ground-water information.

There are no water-supply wells in the permit or adjacent areas. Locations of ground water monitoring wells are shown on Plate 7-1. Collar elevations, depths, and other information are summarized in Table 7-1. Locations of springs are shown on Plate 7-1 and water rights are shown on Plate 7-2. Ground water is used for wildlife and stock watering. Monitoring locations are shown on Plate 7-1. A hydrologic evaluation of the area, by Mayo and Associates, is in Appendix 7-3.

Data on ground water have been collected by the Soldier Canyon Mine operators from 97 springs, seeps, and mine water inflows in and adjacent to the proposed permit area. An additional 8 dry locations have been monitored. Some data are from as early as 1976. In

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

1995, 58 spring and seep locations were monitored, an average of twice each: 44 had at least one measured flow, 7 had only seepage, and 7 were dry. In addition, 9 in-mine locations were monitored, once each. Water quality analyses and isotope ratio determinations were performed. Many of these locations had not been monitored previously.

Data in Appendix 7-2 are from multiple sources, so not all samples were analyzed following DOGM Guidelines. However, the data are indicative of baseline conditions within the permit and adjacent areas. Manganese data in Appendix 7-3 represent determination for total manganese concentrations.

Information on ground water monitoring is summarized in Table 7-2 of the PAP and monitoring results are summarized in Appendix 7-2 of the PAP. Water monitoring that potentially meets the minimum requirements of SMCRA and the Utah Coal Mining Rules appears to have been done at only 13 (6 springs and 7 in-mine locations) of the 97 sites. Seasonal quality cannot be determined from the small number of samples (average of three) analyzed for each site.

Wells GW-10-2, GW-11-2, and GW-24-1 (all completed in the Castlegate Sandstone) and springs SP-45 (Colton Formation), SP-2 Flagstaff Formation), SC-14 North Horn Formation) , and SC-80 (Castlegate Sandstone) will be used to monitor ground water conditions in the proposed permit area. Locations of wells and springs to be monitored are on Plate 7-1.

Spring SC-80 is located outside the proposed permit boundary and updip of the proposed mine. Dugout Canyon, deeply eroded into the Book Cliffs, at least partially isolates this spring and the hydrologic system supporting it from the area to be mined. This spring appears to be a poor choice for monitoring effects of the proposed Dugout Canyon Mine on the Castlegate aquifer, but it and the nearby SC-81 appear to be the only springs issuing from the Castlegate sandstone in the permit and adjacent areas.

Mining operations at the Soldier Canyon Mine intercept ground water stored in the Blackhawk Formation in regional and perched systems. Indications are that ground water from younger, shallower strata is not being affected by the mine. Mine operations at Dugout Canyon are predicted to have a steady-state inflow of up to 220 gpm from sources within the Blackhawk Formation without disturbing ground water systems in the younger, overlying strata.

Ground-water quantity descriptions include approximate rates of discharge or usage and depth to the water in the coal seam and in each water-bearing stratum above and potentially impacted stratum below the coal seam.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

The determination of the probable hydrologic consequences (PHC) indicates adverse impacts to the hydrologic balance, on or off the proposed permit area, will not occur. Acid-forming or toxic-forming materials that may result in the contamination of ground-water or surface-water supplies are not present. Supplemental information is not needed to evaluate such probable hydrologic consequences and to plan remedial and reclamation activities.

Surface-water information.

Analysis:

Surface-water baseline information is addressed in Section 724.200 beginning on page 7-32. Hydrographs of Soldier Creek and Dugout Creek are included on pages 7-34, 7-35, and 7-38, Figures 7-8, 7-9 and 7-10, respectively. Water Quality information begins on page 7-38. Surface water data is presented in Appendix 7-7. Water bodies, sampling location and water rights locations are shown on Plates 7-1 and 7-2.

The major streams in the permit area are Dugout Creek, Fish Creek and Pine Creek. Fish Creek and Pine Creek are tributaries to Soldier Creek. Dugout Creek, Fish Creek and Pine Creek are all perennial streams; however, Pine Creek is only perennial in its upper reaches near the northern border of the permit area.

The application contains information on the flow of Dugout Creek and Soldier Creek and the sources of water that feed each stream. This information can be found in the application on pages 7-32 through 7-38. Analysis on this information is addressed in the surface water portion of the cumulative hydrologic impact assessment (CHIA) as prepared by the Division. No stream flow data are available for the ephemeral drainages in the permit area.

The application states that several small impoundments have been constructed in and around the permit area for watering stock.

Water quality samples have been taken from Soldier Creek, Dugout Creek and Pine Canyon. Sampling locations are shown on Plate 7-1. Chemical makeup of the water is driven by flow. High flow periods are characterized by low TDS, calcium bicarbonate water. Low flow analyses are characterized by higher TDS concentrations with different chemical compositions, dependant on the geologic formation most influential on the stream.

All surface-water quality data presented is from a sampling plan carried out in the last 10 years. There is not surface-water quality data from the past two years. The amount of data and timing of data is sufficient to describe the seasonal water quality and quantity variations.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

The proposed disturbed area and the permit area have be modified by land use practices since the bulk of the available data have been received. The available data shows a more natural characterization for the hydrologic system of the area. It may be desirable for the applicant to collect more current data, reflecting the current system, as a means for showing that the proposed mining activities has not caused degradation to the water quality or quantity. Without any other, more current data, all water degradation observed in the period that the proposed mine is operated and reclaimed will be attributed as being caused by the mining and reclamation activities.

Findings:

The application is complete and accurate in the area of surface-water information.

Climatological information.

Analysis:

According to Section 724.400 climatological data are summarized in Appendix 4-2. The summary begins on page A4-2-1 about 23 pages from the front of the appendix. Information covered includes suspended particulates, wind speed, wind direction, ambient temperature, precipitation and relative humidity. Depth-duration-frequency information is provided on page 1 of Appendix 7-9.

Findings:

The climatological information is complete and accurate.

Baseline cumulative impact area information.

Hydrologic and geologic information for the cumulative impact area, necessary to assess the probable cumulative hydrologic impacts of the proposed operation and all anticipated mining on surface and ground water systems are available from appropriate Federal or State agencies. The applicant has gathered additional information and submitted it as part of the PAP.

Section 725, page 7-41 says that information necessary for the Division to develop a Cumulative Hydrologic Impact Assessment (CHIA) is presented in Chapters 6 and 7. The Probable Hydrologic Consequences (PHC), Section 728 beginning on page 7-41, Appendices 7-2, 7-3, 7-4, 7-5, and 7-7 contain the necessary data.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Findings:

The baseline cumulative impact area information is complete and accurate.

Modeling.

Modeling techniques, interpolation, or statistical techniques have not been used in preparing the permit application.

Page 7-41, Section 726 says that no surface-water or groundwater modeling was directly conducted for this application.

Findings:

The applicant has met the minimum requirements for surface-water modeling.

Alternative water source information.

Analysis:

Section 727 on page 7-41 says that no *surface* mining will be conducted in the permit and adjacent areas. The PHC does not indicate a need for alternative water sources.

Findings:

The applicant has met the minimum requirements for alternative water source information.

Probable hydrologic consequences determination.

The PHC determination, prepared by Mayo and Associates, is in Appendix 7-2. Previous studies in the vicinity of the Soldier Canyon Mine were reviewed for information on geology, hydrology, and hydrogeology. They were also reviewed for data on discharge, sediment, and other surface and ground water parameters, and seventeen additional ground and surface water samples were collected in 1995 for chemical and isotopic analyses. In spite of a large data base, most of the analyses lack information on the basic parameters required by the Coal Mining Rules and SMCRA, and on seasonal variation.

Potential adverse effects to the hydrologic balance from the proposed mining operations are: decreased stream flows and spring discharges due to capture of surface or

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

ground water by subsidence, bedrock fracturing, and aquifer dewatering; increased stream flows due to increased discharge of ground water from the Blackhawk Formation through the mine workings; and increased ground water recharge to overlying ground water systems.

Chemical and isotopic analyses of ground water, data from hydrographs, and the behavior of ground water systems in and adjacent to the Soldier Canyon Mine indicate that mine has not adversely impacted ground water quantity or quality. Subsidence and surface fracturing have not occurred above the Soldier Canyon Mine. Mining locally dewateres strata immediately adjacent to the Blackhawk Formation but does not appear to draw additional recharge from other overlying or underlying ground water systems. Similar geologic, hydrogeologic, and hydrologic conditions exist at the proposed Dugout Creek Mine and the proposed operations should not adversely impact water quantity or quality in ground water systems overlying and underlying the coal to be mined.

Baseflow in Soldier Creek upstream of the Soldier Canyon Mine and the Blackhawk Formation outcrop responds to seasonal climate variations, low flow in the creek being as little as 5 gpm in drought years and as high as 140 gpm in wet years. Andalex has determined average low flow is approximately 50 gpm. Below the mine, mine discharge is a major contributor to stream flow, especially during summer and autumn. Measured flows for August have been as low as 170 gpm.

Steady-state inflow to the Dugout Canyon mine is expected to be approximately 220 gpm (DCMRP p. 7-49). Mine consumption is estimated to be 30 gpm, leaving 190 gpm discharge to Dugout Creek, which would represent an increase of approximately six percent over average annual flow.

In Appendix 7-3 it is estimated that the maximum discharge from both the Dugout Canyon Mine and the Alkali Tract of the Soldier Canyon Mine will be 800 gpm, and that approximately 400 gpm of the maximum can be attributed to each operation. If this maximum rate were sustained for a full year it would be a thirteen percent increase in the estimated average annual flow.

The potential for mine water discharge and increased flow rates in Dugout Creek are based on the studies of Lines (1985 - see DCMRP for reference). Actual data that could be used to correlate coal production rates to mine water discharge rates at the Soldier Canyon Mine and to predict mine water discharge rates for the Dugout Canyon Mine are not in the PAP.

Subsidence, propagation of fractures from mine workings to the surface, and increased infiltration at the surface induced by dewatering of ground water systems have the potential to increase the rate and quantity of recharge to ground water systems overlying the Blackhawk

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Formation. At the Soldier Canyon Mine, ground water systems in the Blackhawk Formation are hydraulically isolated from ground water systems in overlying strata, and subsidence and fracturing have not altered the hydrologic balance between ground water systems. There has been no observed increase in rate or quantity of recharge at the Soldier Canyon Mine and no increase is expected at the Dugout Canyon Mine.

The PHC begins on page 7-41. It is included in Section 728 through 728.300 and Appendix 7-3, the Mayo and Associate report, Section 3.0. The determinations of consequences are in Section 728.300 beginning on page 7-42. Impacts of mine are included in the Mayo and Associate report beginning in Section 3.0, page 60.

The following potential impacts are addressed in the PHC.

- Acid and toxic contamination of water;
- Increased sediment yield from the disturbed area and local subsidence;
- Changes in acidity, total suspended solids (TSS) and total dissolved solids (TDS);
- Flooding and streamflow alteration;
- Groundwater and surface-water availability;
- Potential hydrocarbon contamination;
- Road salting.
- Coal haulage.

There is no significant potential for acid and toxic contamination of water because there are no acid- and toxic-forming materials present in the Dugout Canyon Mine. Sediment control methods will be used to minimize the potential for increased sediment yield.

Discharges from the mine are expected to increase the TDS concentrations by as much as double the typical concentrations in Dugout Creek. This creek is classified as a class 2B, 3C and 4 water. Class 4 is the only classification with TDS stands which is set at 1,200 mg/L. The increased TDS levels from mine discharge is not expected to approach those levels. Any discharged water will be much lower in dissolved and total iron and manganese than water-quality standards permit.

Flooding and streamflow alterations will be controlled by routing water off disturbed areas through the sediment pond. Discharges from the mine will be controlled as to not add to flood potential. After mining is discontinued the portals will be sealed so that water from the mines will not readily drain into the creek causing increased potential for flooding. Page 47 explains that increase flow will cause an increase in the quantity of channel vegetation, which will protect the channel from excess erosion.

Evidence from the nearby Soldier Canyon Mine shows that there has been no detected subsidence and the limited available groundwater in the are has made it so the rock fracturing

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

caused by mining will not cause a decreased spring or stream flow. The Blackhawk groundwater systems is the predominant system that will undergo affects from mining and formation fracturing. However, data shows that the water in this system is old water and does not play a significant part in the spring and surface-water flows in the area. Since the surface flows are more significantly influenced by the Flagstaff and North Horn formations, and these formations are not likely to be disturbed by subsidence or fracturing, spring and stream flows are not expected to be disrupted by mining activities.

If water is encountered in the Dugout Mine it will be pumped eventually into Dugout Creek. The PHC includes a high estimate for the amount of water received into the mine of 220 g.p.m. but actual inflows are expected to be much less that this figure. Further some of this water will be consumed in the mine as part of the mining operation. The maximum estimate of 190 g.p.m. (0.42 cubic-feet per second or 306 acre-feet per year)will be received into Dugout Creek. This is a six-percent increase to annual stream flow.

When average over the year this does not appear to be a significant change; however, the amount of flow during the summer and fall months is much greater than in natural stream flow. The baseline data shows that Dugout Creek tends to flow under 0.5 cubic-feet per second during the drier months (usually July through September) and often dries up completely during this time. If water is constantly discharged from the mine throughout the year at or near the average rate it may result in drastic changes to geomorphology and vegetation in the stream channel.

Diesel fuel, oils, greases, and other hydrocarbon products present a potential contamination source from mining activities. Hydrocarbon contamination will be prevented by locating diesel and oil above ground to avoid leakage; spillage in refueling will be minimized; and, in case of spill, a spill prevention control and countermeasure plan has been developed and will be maintained on site.

Road salt will not be use in the permit area so it should not present an environmental concern.

Accidental spills and wind blown coal dust pose a potential effect to the hydrology in the area of the Dugout Mine. However, spillage is unlikely and coal dust should have a minimal effect on the water because of the small amounts of coal lost during transport.

Findings:

The applicant has met the minimum requirements for probable hydrologic consequences.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

When required by the Coal Mining Rules, cross sections, maps, and plans included in the MRP and have been prepared by or under the direction of and certified by a qualified, registered, professional engineer with assistance from experts in related fields.

Coal Resource and Geologic Information Maps

Surface geology for the permit and adjacent areas is shown on Plate 6-1, a certified map. Elevations (to the nearest 40 feet) and locations of test borings are also shown on Plate 6-1. Coal crop lines are shown on Plates 6-1 and 6-2. Strike and dip of strata at the surface are shown on Plate 6-1 for several locations within and adjacent to the southwest corner of the proposed permit area: dip is also indicated by cross-section A-A' (Figure 6-1). Strike and dip are apparently uniform over a larger area, but explicit information for the larger area would be useful.

Limited information on nature, depth, and thickness of the Rock Canyon seam, which is the coal seam to be mined, is on bore hole logs in Appendix 6-1 and on cross-sections B-B' and C-C' (Plate 6-3). Similar information on the overlying Sunnyside seam and the underlying Gilson seam is on cross-sections B-B' and C-C' (Plate 6-3), and also on bore hole logs in Appendix 6-1. Overburden is shown on bore hole logs in Appendix 6-1. Plate 6-4 is an isopach map of the Rock Canyon seam overburden thickness and Plate 6-5 is an isopach map of the Rock Canyon to Gilson seam interburden thickness. There is no isopach thickness map of the Rock Canyon seam nor of the Gilson seam, the other minable seam, nor of the Sunnyside seam, the principal rider seam.

Monitoring Sampling Location Maps

Locations and approximate elevations of bore holes are shown on Plate 6-1. Collar elevations, some estimated from topographic maps, and elevations of cored sections are given in Appendix 6-1.

Elevations and locations of monitoring stations used to gather data on water quality and

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

quantity in preparation of the application are on Plate 7-1.

Subsurface Water Resource Maps

A potentiometric surface map for the Castlegate Sandstone, covering the eastern portion of the proposed permit and adjacent areas, is shown on Plate 7-2. There are no maps, plans, or cross-sections showing potentiometric surfaces for shallower or deeper strata. Subsurface water within the proposed permit and adjacent areas occurs mainly in perched aquifers in the Blackhawk Formation, the underlying Starpoint Sandstone, and in overlying strata, so an exact areal and vertical distribution of ground water is not known. There is no map of a potentiometric surface for a regional aquifer. Data in the MRP indicate an irregular potentiometric surface in the Blackhawk Formation, near the Soldier Canyon Mine, that is influenced by the outcrop of the Blackhawk Formation in nearby Soldier Canyon, the mine workings, and the non-uniformity of screen length and placement within the strata, and the lateral discontinuity of the strata (DCMRP p. 7-29). There is no portrayal of seasonal differences of head in different aquifers on cross sections or contour maps, but hydrographs for several springs and graphs of water levels in four monitoring wells are provided.

The relationship of geology to ground water is discussed extensively in the text, yet there is no map that relates geology to ground water occurrence, in particular the location of springs in relation to surface exposures of stratigraphic units.

Spring 10 issues from the North Horn Formation but the water may originate in a deeper formation and reach the surface through a fracture. The chemistry and long-term hydrographs of Spring SP-10 are more consistent with a deep source, rather than a shallow source such as seen in springs issuing from the Flagstaff, North Horn, and Price River Formations. Isotopic and solute compositions are similar to those in ground water from the Blackhawk Formation. There is no fracture mapped but the major water-bearing fracture in the Soldier Canyon Mine coincides approximately with the surface location of this spring.

Surface Water Resource Maps

There are no water-supply intakes for current users of surface waters flowing into, out of, and within the proposed permit and adjacent area. Surface waters that will receive discharges from affected areas in the proposed permit area are shown on Plate 7-1. Location of surface water bodies such as streams, lakes, ponds, springs, constructed or natural drains, and irrigation ditches within the proposed permit and adjacent areas are shown on Plate 7-1.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Well Maps

There are no gas and oil wells within the proposed permit and adjacent areas. There are no water wells in the proposed permit and adjacent areas.

Findings:

Resource information presented on maps, plans, and cross sections is not considered adequate to meet the requirements of this section. Prior to approval the applicant must provide the following in accordance with:

R645-301-522, -622.200, -623.300, -625, (Repeat) Isopach maps of coal thickness are needed to evaluate the subsidence control plan and to evaluate maximization of coal recovery.

OPERATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Analysis:

The Response to Deficiency submittal did not satisfactorily address the following deficiencies:

- Soil Removal - Salvage all undisturbed and appropriate disturbed soils.
- Soil Salvage - Provide a Soil Scientist during salvage to optimize soil salvage.
- Appendix 2-5 - All calculations need surface area and soil depth amounts.

Soil Removal - Salvage all undisturbed and appropriate disturbed soils.

Since topsoil is of insufficient quantity, soil salvage will not only include the undisturbed soils (TS and #96), but also previously disturbed soils, overburden material and subsoils. All topsoil will be salvaged, including all subsoil. The SOIL RESOURCE SECTION provides adequate information on the excellent quality of the TS subsoil, B and C horizons. The undisturbed TS soils are deep rich mollisols, with deep subsoils of excellent quality material available for salvage. In addition, it is unclear if any undisturbed soils marked #96 will sustain new disturbance since these areas are within the disturbed boundary. These southwest facing, undisturbed soils need to be identified for salvage if disturbance will occur in these buffer zones.

Soil salvage will include much of the appropriate overburden as identified in the soil survey. Although much of the mine area is considered disturbed, the two test pits (TP2 & TP3) show that much of the overburden material is an acceptable substitute topsoil and suitable growth medium for reclamation, with the exception of the percentage of rock fragments. The Division recognizes that native soils and disturbed soils contain high percentages of rock fragments, is inevitable and does not present a reclamation hazard. Indeed, to reclaim and restore the land to pre-mining conditions will require soils with indigenous rock fragment volumes and contents. Therefore, it is not only desirable to salvage soils containing intrinsic rock fragments, but the Division now requires that soils be salvaged containing natural rock

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

and no longer accepts the rationale that high rock-content soils not be salvaged.

Soil Salvage - Provide a Soil Scientist during salvage to optimize soil salvage.

The Division requests that a non-biased, third party, professional soil scientist be on-site during soil salvage to monitor and supervise soil salvage operations for the purpose of maximizing soil salvage volumes and quality.

Appendix 2-5 - All calculations need surface area and soil depth amounts.

Appendix 2-5 includes soil recovery calculations. However, not all calculations include surface area and soil depth amounts. In order to correctly appraise soil recovery calculations, all calculations need surface area and soil depth amounts.

Findings:

The permittee must provide the following, prior to approval, in accordance with the requirements of:

R645-301-232, All topsoil and subsoil will be removed from the area to be disturbed and where topsoil is of insufficient quantity, materials approved by the Division in accordance with R645-301-233.100 will be removed and salvaged from the area. Since topsoil is of insufficient quantity, soil salvage will not only include undisturbed soils (TS and #96), but also previously disturbed soils, overburden material and subsoils.

The Division requests that a non-biased, third party, professional soil scientist be on-site during soil salvage to monitor and supervise soil salvage operations for the purpose of maximizing soil salvage volumes and quality.

R645-301-120 and R645-301-130, Appendix 2-5 includes soil recovery calculations. However, not all calculations include surface area and soil depth amounts. In order to correctly appraise soil recovery calculations, all calculations need surface area and soil depth amounts.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

FISH AND WILDLIFE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.21, 817.97; R645-301-322, -301-333, -301-342, -301-358.

Analysis:

Protection and enhancement plan.

The proposed disturbed area will be limited to that area which was previously mined and not reclaimed. The operator further committed to limiting the extent of the disturbance and to reseed with an interim seed mixture. The Permittee commits to a wildlife awareness and protection training in it's annual training curriculums for all employees and haulage contractors. A stream buffer zone has been established around Dugout Creek. The Permittee should consider an enhancement plan for the riparian community within the disturbed area.

The permit states the SCM will request that power lines on the Dugout Canyon mine site be construct with approved methods. This statement contradicts another statement in the permit committing to raptor safe powerlines. The permit must not contradict and it must state that all power lines within the disturbed area will be raptor safe.

The Permittee further proposes to minimize impacts by controlling and monitoring the surface water discharge and water quality.

Endangered and threatened species

No endangered or threatened plant or animal species are known within the area. As required by R645-301-358.100 the permittee must promptly report to the Division any state or federally listed endangered or threatened species within the permit area of which the operator becomes aware. Seasonal or migrating Bald Eagles are expected and a wintering Bald eagle would not need to be reported.

Bald and golden eagles.

The Permittee proposes to prevent subsidence disturbance to nesting raptors by covering the specific raptors nest during the period of potential subsidence to prevent habitation (Section 333.300). "Alternate methods will be discussed with agencies and determination of methods being made during the period of subsidence". Any action such as described must first be approved by the Division who will consult with U.S. Fish and Wildlife Service (USFW) and DWR prior to potential subsidence. The statement in the text of the permit must be modified. A commitment is made to continue monitoring of the permit area by

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

helicopter for any new or previously undisturbed raptor nests. Annual monitoring will concentrate in the areas which will be mined in the next two years. If any nests are found, the Permit must be updated with this information and an assessment will be made at that time if the mining will affect the nest.

The statement is made that golden eagle nests only need to be avoided while they are inhabited mid-April to mid-June (Section 322.200). Breeding and nesting territories must be avoided February to early July. Raptor nests are legally protected year long whether active or not. The avoidance comment must be modified with correct information.

Wetlands and habitats of unusually high value for fish and wildlife.

The statement is made in the text that habitats within the proposed disturbed area are not considered to be of unusually high value. However, most all water areas and associated stream side vegetation in Utah are considered high value habitat. Additionally, the wildlife map, Plate 3-2 indicates that the area is considered critical mule deer summer range. The permit must be modified to acknowledge these high value areas as required in **Fish and Wildlife Resource Information** of this Technical Analysis.

Cliff escarpments within the permit area are considered high value habitats. If present these habitats could potentially be effected by subsidence should be identified on a map.

Findings:

Information found in the plan does not meet the minimum regulatory requirements of this section. Additional information must be provided by the permittee in order for the Division to approve this section.

R645-301-333, the plan has stated the methods used in wildlife protection however, no plan is given for enhancement of critical resources and how this will be achieved.

R645-301-358.200, the plan must qualify the statement that any nesting raptor nests will be covered to prevent habitation in the case of potential subsidence. This method may possibly be used, but only after the Division has consulted with DWR and USFW and identified whether and under what conditions the operator may proceed. The stated period of nest avoidance must be corrected to reflect actual protection periods.

R645-301-333, powerline construction information within the permit is contradictory and must state that all power lines within the disturbed area will be raptor safe.

MINING OPERATIONS AND FACILITIES

Analysis:

General

Type and Method of Mining Operations

In Section 523 the Applicant states:

"Room-and-pillar mining methods will be used in the Dugout Canyon Mine. The use of this mining method has been selected to maximize coal recovery and enhance production rates within the specific geologic constraints of the permit area. Longwall mining methods are not planned because these methods do not allow the selective horizon control that is necessary to reduce dilution of the coal with rock from the in-seam partings anticipated in this deposit.

Continuous miners will be used, with either electric or diesel shuttle cars to haul coal to a feeder breaker at the section conveyor belt terminal end. Alternatively, electric continuous haulage system(s) between the miner and the section conveyor belt may be used. The continuous haulage system is comprised of a coal collecting hopper car located at the miner discharge boom, several track-mounted articulating mobile bridge conveyors, intermediate suspended bridge sections, and a rigid frame module conveyor assembly to discharge onto the section conveyor belt. The continuous haulage configuration is designed for higher production rates as compared with shuttle car haulage and will be used mostly in first and second mining panels. Roof bolters, scoops, power centers, and other auxiliary support equipment will be used in all mining sections.

Mining will consist of driving five to seven main and submain entry systems. Production panels, driven from these access entry systems, will consist of rooms and pillars. Pillar extraction in the panels (second mining) is planned up to overburden depths of approximately 1,750 feet. It is anticipated that full roof bolting plans will be mandatory from MSHA and that bolting of the ribs throughout the mine will not be required.

Equipment heights and economics will limit seam mining heights to a minimum of 6 feet. Roof bolters planned for use at the Dugout Canyon Mine (Fletcher Model HDDRs) are 73 inches high. The Long Airdox continuous haulage system operator cabs are 77 inches high. The rock duster-equipped Joy continuous miner is 72 inches high. It is presumed at this time that these equipment pieces may be modified to less

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

than 72-inch operating and transport heights without impairing performance, safety, or upper limit operating heights to allow 72-inch mining heights. If such modifications are disallowed by MSHA or not made possible by the equipment manufacturers, or impede productivity, recovery of reserves in this height range may not be possible.

Anticipated Production. Anticipated annual production of coal from the Dugout Canyon Mine during the permit term is as follows:

1997 - 0 tons
1998 - 0.5 million tons
1999 - 1.5 million tons
2000 - 2.0 million tons
2001 - 2.0 million tons

Through the remaining life of the mine, coal production from the mine is anticipated to be 2.0 million tons per year."

The Applicant met the requirements for R645-301-523 by giving the Division a description of the proposed mining method. The Applicant proposes to develop a coal mine that will have an annual production of 2,000,000 tons. The surface area available to the Applicant is limited because of topography. Because of the limited surface area at the mine site, the Applicant wants to minimize surface facilities.

Facilities and Structures

The Applicant lists the existing and proposed facilities and structures in Section 526 and 528 of the PAP. The Division has enough information to evaluate those structures. The Division's analysis of each structure is given in the section of the TA that deals specifically with that structure.

Findings:

The Applicant met the minimum requirements of R645-301-523 by describing the type and method of coal mining, the anticipated annual and total coal production, and the major equipment to be used for coal mining.

The Applicant met the requirements of R645-301-526 and R645-301-528 that deal with providing the Division with information about the existing and proposed surface structures and facilities. The Division's analysis of those structures and facilities is given in other parts of the TA.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

EXISTING STRUCTURES:

Analysis:

In Section 521.100 under the subheading "Existing Surface and Subsurface Facilities and Features" the Applicant states:

"No buildings are located in and within 1000 feet of the permit area. No transmission lines, pipelines, or agricultural drainage tile fields exist within, passing through, or passing over the proposed permit area. Hence, a map of these non-existing facilities is not provided in accordance with R645-301-521.123 and R645-301-124.

Plates 4-1 and 5-2A depict the location of an existing UP&L distribution line that will be improved and activated to provide electrical service to the mine. This distribution line will be owned and upgraded by UP&L."

The information in Section 521.100 seems contradictory. The Applicant states that transmission lines do not exist in the proposed permit area and then state that the location of transmission lines is shown on Plates 4-1 and Plate 5-2A. However, they do not show transmission lines on Plate 4-1 or Plate 5-2A. The information in the PAP about the existing transmission lines is confusing. The Applicant has not been clear and concise in describing the existing transmission lines in the permit area.

The Applicant did not list the dirt road in the proposed permit area as required by R645-301-526.100. Those roads will be used for surface mining activities. The Division considers the dirt roads to be existing facilities. The Applicant must list the dirt roads in Section 521.100 of the PAP.

Findings:

The Applicant failed to meet the requirements. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-121.200, clear and concise description of the existing transmission lines.

R645-301-526.110, list and describe the existing dirt roads in the permit area.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

RELOCATION OR USE OF PUBLIC ROADS

Analysis:

In Section 526.116 of the PAP the Applicant states:

“They will conduct no coal mining operation within 100 feet of a right-of-way line of any public road, except where mine access or haul roads join the right-of-way.”

In Section 521.100 of the PAP the Applicant states:

“An existing county road enters the permit area in NE1/4, SE1/4 Sec.22, T. 13S., R. 12E., extending within that section for approximately 500 feet within the permit area. The road then exits the permit area for approximately 1,300 feet length, then reenters the permit area in the SW1/4, NW1/4 Section 23 where it ends at the southern edge of the proposed disturbed area boundary.”

In Section 527.00 of the PAP the Applicant states:

“The road which will access the mine is a county road that extends from the Soldier Creek Road (Utah Highway 53) to the mine (a distance of approximately 7.5 miles). Carbon County is currently planning the upgrade of this road to handle the increased traffic which is anticipated as a result of mine operation. The County will construct the upgrade and charge SCM a toll for use of the road.”

The Applicant does not propose to move a public road. The County will upgrade the existing county dirt road that goes from the Soldier Creek Road to the mine site. The Division considers the upgrade to the existing dirt road to be a county activity and outside the Division’s jurisdiction. The Division will not require the upgrade to be permitted.

The Applicant does not propose to conduct mining and reclamation operations within 100 feet of a public road accept where the mine road accesses the public road. The county road is outside the subsidence zone and disturbed area. Mining and reclamation activities should not interfere with the public’s use of the county road. The Applicant has met the requirements of R645-301-521 and R645-301-526 that deals with public roads in or near the permit area.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Findings:

The Applicant has met the minimum requirements of R645-301-526.116 and R645-301-521.133.

COAL RECOVERY

Analysis:

- The Applicant failed to meet the minimum requirements of R645-301-522.

In Section 522 of the PAP the Applicant states:

"Mining operations at the Dugout Canyon Mine during the first 5-year mining term will occur in the Rock Canyon Seam. Future mining operations may also occur in the Gilson Seam. If the decision is made to mine in the Gilson Seam, information pertaining to the mining of this seam will be included in the M&RP prior to the performance of such mining. The overall objective of mining operations in the permit area will be maximum coal recovery coupled with safety. Coal recovery at the mine has been and will continue to be maximized through the following efforts:

- Based on pre-mining analysis of drill-hole data and information obtained from past mining operations in the area, estimates of the nature, depth, and thickness of the coal seam and associated partings have been made. Using these data, the mine plan and mining methods will be periodically evaluated and amended as necessary to maximize coal recovery; and
- Experience gained during mining will be used to amend future mine plans if coal recovery can be increased."

The mine layout has been planned relative to panels, barriers, and pillars to optimize both coal recovery and safety.

The Applicant agreed to maximize coal recovery. However, he did not give the Division details of the coal recovery plan such as the extraction ratio and minimum coal thickness. Without detailed information about coal recovery the Division cannot make a finding about maximizing coal recovery.

The Division realizes that the coal recovery plan will change over time. The Applicant can modify the coal recovery plan when they gain new information about coal quality and

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

mining conditions.

When federal coal is mined, the BLM usually has the primary responsibility to monitor coal recovery. If coal is being mined on state lands, the Division has the primary responsibility to insure maximum coal recovery. The Division has an interest in maximizing coal recovery.

Findings:

The Applicant did not adequately address the requirement of this section, Prior to approval, the Applicant must provide the following in accordance with:

R645-301-522. The Applicant must supply the Division with details about the coal recovery plan.

SUBSIDENCE CONTROL PLAN

Analysis:

Renewable resources survey.

R645-301-525.100, requires the Applicant to survey the permit and adjacent areas for structures and renewable resources that have the potential for being damaged by subsidence. Section 525.100 of the PAP contains the subsidence control plan in it the Applicant states:

As noted in Section 521.100, no transmission lines, pipelines, or agricultural drainage tile fields exists within the area of potential subsidence. As described in Section 527.200, the roads within the area of potential subsidence consist of private roads that are owned and maintained by the parent company of SCM. These are unimproved dirt roads that will be used for access to the lease area. While localized damage may occur to these roads from subsidence, this damage will not be monetarily significant to the owner, since the owner is the parent company of SCM. No other structures are known to exist within the area of potential subsidence.

Renewable resource lands within the permit and adjacent areas are shown on Plate 4-1 and discussed in Section 411 of this M&RP. The area of potential subsidence is currently used for livestock grazing and wildlife habitat, with limited timber production on adjacent lands to the east of Dugout Canyon (see Section 411.120). Hydrologic resources in the area are discussed in Chapter 7 of this M&RP. Information regarding baseline groundwater conditions is provided in Section 724.100.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Subsidence control plan.

Since the survey listed the structures and renewable resources that have the potential for subsidence damage the Applicant is required by R645-301-525.100 to develop a subsidence control plan.

Mining Methods

The Applicant states in Section 523 and Section 525.100 that the room-and-pillar method will be used. Entries, haulage routes and airways will be protected by leaving pillars. Both primary and secondary mining will occur in the panels. The size, sequence, and timing for the development of the underground workings are shown on Plate 5-5. The Division has enough information about mining methods to understand where subsidence will occur. The Applicant has met the requirements of R645-301-525.110.

Physical Conditions Affecting Subsidence

The Applicant provides a detailed description of the physical conditions that influence subsidence in Chapter 6. The geologic setting of the Dugout Mine is similar to that of the Soldier Canyon Mine and others in the area. Subsidence has not caused major problems in the area and the Division has no reason to assume that subsidence at the Dugout Mine will be different. The Applicant has met the requirements of R645-301-525.120.

Subsidence Control Measures

The main subsidence control method is to conduct mining away from important structures in the permit area. The mine's surface facilities and county road are the major structures in the permit and adjacent areas that need subsidence protection. The county road and surface facilities are outside the subsidence zone and damage to those structures is unlikely. See Plate 5-5. The Applicant has met the requirements of R645-301-525.130.

Subsidence Monitoring

The Applicant will monitor subsidence with annual terrestrial surveys, and aerial surveys when needed. Other mines in the area use similar subsidence monitoring programs. The results of those programs have met the Division's requirements.

The subsidence monitoring stations give the Division information about the settlement that occurs after mining, the angle-of-draw and how long subsidence will occur after mining. This information is useful in evaluating future subsidence monitoring activities.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Terrestrial surveys are the best method for finding subsidence damage. The Applicant should inspect important area such as roads and springs periodically to decide if any subsidence damage has occurred.

The Applicant has established many control points within the permit and nearby areas to help in subsidence surveys (see Plate 5-5). Coordinates and elevations of these control points (as established in January 1984) are provided in Table 5-2. The control points consist of traverse monuments, benchmark monuments, and survey stations (as indicated on Plate 5-5) which the Applicant has constructed generally as follows:

Traverse and Benchmark Monuments - These monuments are constructed with a 3¼-inch diameter tap-on convex cap with a center punch mark and a 5-foot long center rod. The center rod has been emplaced in a 5.5- to 6-foot deep poured concrete casing of approximately 10 inches in diameter. Where rock was encountered before the required depth, the rock was broken with a stone rod and an anchor point was grouted into the rock using a concrete patching material. Alternatively, monuments in rock were emplaced as described below ("Rock Monuments and Stations"). The diameter of the upper portion of the monument pour was enlarged to 1.0 to 1.5 feet. Concrete was emplaced in a continuous pour.

Survey Stations - These stations consist of No. 5 rebar rods with a length of 5 feet. Each rebar has been fitted with a 2-inch diameter aluminum cap which has a plastic insert designed to secure the cap to the rod. The caps are plain with a center punch mark and a concave label across the top. Where survey stations are installed in boulders or rock which did not allow the use of a 5-foot length of rebar, they were installed as indicated below ("Rock Monuments and Stations").

Rock Monuments and Stations - Where survey monuments and stations are established in boulders and rock which does not allow the installation of a 5-foot long rod in a concrete casing, these monuments consist of an aluminum alloy convex marker with a center punch and concave label. They are secured by drilling a ¾-inch diameter hole to a depth of approximately 3 inches and installing the cap in a concrete grout mixture. This product can be obtained from any concrete products center.

The Applicant will install future monuments and stations required for proper survey controls as described above. Since geologic and mining uncertainties often force a change in planned mining sequences, the Applicant may install future control points only after the mine panels are in their development phase.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

The Applicant will carry out subsidence monitoring annually and will entail direct ground surveys and visual surveys of the permit area. The major concerns of the subsidence monitoring will be the renewable resources, including perennial streams and springs. The methods used for monitoring are ground surveys of monuments and visual surveys of areas surrounding monitored seeps, springs, and streams during water monitoring or any other surface activities.

Future surveys will concentrate on areas that the Applicant has mined in the past or anticipates mining within the upcoming year. Therefore, the Applicant may expand the survey area each progressive year.

Annual resurveys of the mine permit area will produce vertical control at the same sites as the previous year. The Applicant will monitor each monument annually while they are mining the area underlying the site or is still potentially subsiding. The subsiding monuments that show no change for two consecutive years will be considered stable and omitted from future annual surveys. If the Applicant anticipates additional mining within the stable areas occurs, these areas will again be added to the annual surveys.

Besides the ground surveys, the Applicant will include aerial photogrammetric methods in the surveys when the areas become too large to handle with ground surveys feasibly. This method may be added to enhance the ground surveys and to cover larger areas as the mine expands. The Applicant will make visual checks for subsidence during all surface activities, especially during water monitoring activities. These visual surveys will detect surface irregularities, and surface cracks.

Each year, the Applicant will send a subsidence monitoring report to the Division. This report will include dates of surveys, a description of the methodology used, and results obtained. This report will also include changes in the monitoring plan that the Applicant may make due to economic conditions or technical advancement in subsidence monitoring.

Performance Standards for Subsidence Control.

The Applicant states in Section 525.200 of the PAP they do not anticipate that subsidence damage to surface resources. However, should material damage occur, SCM will correct any material damage to the extent technologically and economically feasible. In addition, SCM will notify the Division of any slide, rock fall, or other disturbance caused by subsidence that will affect the environment. The Applicant has met the requirements of R645-301-525.170.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Findings:

Renewable resources survey.

The Applicant has met the minimum requirements of R645-301-521.100 by conducting a renewable resource survey. The Applicant lists some structures and renewable resources that have the potential for being damaged by subsidence.

Subsidence control plan.

The Applicant has met the minimum requirements of R645-301-525.100 regarding a subsidence control plan.

Performance Standards for Subsidence Control.

The Applicant has met the requirements of R645-301-525.170.

SLIDES AND OTHER DAMAGE

Analysis:

In Section 515.100 of the PAP the Applicant states:

"If a slide occurs within the permit area that may have a potential adverse effect on the public, property, health, safety, or the environment, SCM will notify the Division by the fastest available means following discovery of the slide and will comply with any remedial measures required by the Division."

The Applicant has met the minimum requirements of R645-301-515.100 by including a commitment to report slides.

Findings

The Applicant has met the minimum regulatory requirements of R645-301-515.100 for reporting and responding to slides.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Analysis:

Road Systems

R645-301-527.100, requires the Applicant to classify each road in the permit area. In Section 527.100 of the PAP, the Applicant classified all the roads in the disturbed area as primary. The Applicant did not classify the existing dirt roads in the permit area. The Applicant failed to meet the requirements of R645-301-527.100 because they did not classify the dirt roads in permit area.

Plans and drawings.

The Applicant's description of the roads in the disturbed area is confusing. In Section 521.100 of the PAP the Applicant states that the county road ends at the southern boundary of the disturbed area. That description is consistent with the information on Plate 5-2A. In Section 534.100 the Applicant states that they have evaluated the stability of the county road embankment where it passes next to the sediment pond. Plate 5-2A shows the sediment pond well within the disturbed area. The Division is not sure if the roads in the disturbed area belong to the county or to the Applicant. The description of where the county road ends and the private road begins in the PAP must be consistent and correct. The Applicant has failed to meet the requirements of R645-301-121.200 by not stating the boundary of the county road in a clear and concise manner.

In Section 527.200 of the PAP the Applicant states:

Road Specifications.

Cross sections and profiles of roads that will be used or maintained by SCM are provided in Figure 5-2. Information regarding road drainage structures is presented in Chapter 7.

The road which will access the mine is a county road that extends from the Soldier Creek Road (Utah Highway 53) to the mine (a distance of approximately 7.5 miles). Carbon County is currently planning the upgrade of this road to handle the increased traffic which is anticipated as a result of mine operation. The County will construct the upgrade and charge SCM a toll for use of the road.

As currently anticipated, primary roads within the proposed surface facilities will have a 16-foot finished width. As indicated in Figure 5-2, the roads will consist of 2 to 4 inches of

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

granular material, asphalt, or concrete on a compacted, in-place subgrade. The surface of the roads will generally be crowned in the middle and slope at angles of 1% to 2% for drainage. The grade of the disturbed area primary roads will vary, but should not exceed 10%.

The remaining roads within the permit area that may be used by SCM are private roads that are owned and maintained by Canyon Fuel Company, LLC. These roads are private, unimproved dirt roads and will be used for access to the lease area surfaces for the collection of monitoring data (environmental and subsidence data) as well as other uses deemed appropriate by the landowner.

The Applicant stated that the cross sections for the roads are on Plate 2. They do not include plate 2 in the PAP. However, Figure 5-2 shows road cross sections. The road cross sections show the drainage ditches, road surface and embankments.

The Applicant did not include cross sections for the dirt roads in the PAP. Since the dirt roads are existing, structures the Applicant does not have to provide design drawings. Cross section that show that the dirt roads meet they must include the performance standards in the PAP.

In Section 542.600 of the PAP the Applicant states:

All roads not to be retained for an approved postmining land use will be reclaimed immediately after they are no longer needed for mining and reclamation operations. Roads which will be retained through the disturbed area for access to private land within the permit area are noted on Plate 5-3. All remaining roads within the disturbed area will be reclaimed. All roads to be reclaimed will be graded and /or backfilled as indicated above. Topsoil will be applied to the regraded surfaces and the area will be revegetated as discussed in Chapter 2 and 3 respectively.

The Applicant needs to give more details about the how the roads in the disturbed area will be left after reclamation. For example what type of pavement will the roads have and will the culverts remain?

The Applicant did not address how they will reclaim the private dirt roads in the permit area. In conversations with the Division the Applicant has stated that the private dirt roads would be left as part of the postmining land use. The Applicant must address the reclamation of the dirt roads in the permit area. See R645-301-534.140.

In Section 527.200 the Applicant states acknowledge that they will construct conveyors at the mine site. Those conveyors will transport coal from the portals to the coal stockpiles. The Applicant did not provide any cross section or detailed designs for the conveyors as

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

required by R645-301-527.200.

In Section 534 the Applicant states:

“534.100 Location, Design, Construction, Reconstruction, Use, Maintenance, and Reclamation

Control of Damage to Public or Private Property. All roads used by SCM have been or will be designed in accordance with applicable county and State standards. By designing according to these standards, damage to public or private property will be minimized.

Road Surfacing.

The surface of the county road which accesses the mine site will consist of asphalt (see Section 527.200). All ancillary roads will be either asphalt-surface, gravel surface, or unimproved dirt roads. No acid- or toxic-forming materials will be used in the road surfaces.

Slope Stability.

The stability of the county road embankment has been evaluated where it passes adjacent to the sedimentation pond. Results of this evaluation are presented in Appendix 5-4. This analysis indicates that the access road embankment has a minimum safety factor of 4.2 under static unsaturated conditions and 2.1 under static saturated conditions. These values exceed the safety factor of 1.3 required by R645-301-534.130.

All other roads in the permit area exist on private land owned by Sage Point Coal Company (the parent company of SCM). The Applicant anticipates no stability problems for these roads.

Environmental Protection and Safety

The design and reconstruction of the access road will be the responsibility of Carbon County. Safety and environmental protection were primary concerns during the design of other roads within the surface-facilities area. The grade, width, and surface materials used for the roads were selected to be appropriate for the planned duration and use of the roads.

Primary Roads

The only primary road to be used by SCM is the county road which will access the mine site. The design and reconstruction of this road will be the responsibility of Carbon

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

County. The road will be maintained by the County to meet its design standards throughout the life of the mining and reclamation activities. SCCC will assist the County to ensure that catastrophic events are repaired as soon as practical after the damage occurs.

As noted in Section 534.100, the embankment of the county road adjacent to the sedimentation pond will have a minimum static safety factor in excess of 1.3. Any portion of the road within the permit area that is not to be retained for use under an approved post-mining land use will be reclaimed immediately after it is no longer needed for mining and reclamation operations.

Road Alignment.

Selection of the final alignment of the reconstructed access road will be the responsibility of Carbon County. The alignment will be located generally along the alignment of the existing dirt road. The current road location had been in existence for many years and had not experienced major stability problems. Thus, the road will be located on the most stable available surface, giving consideration also to safety and environmental protection.

Road Surfacing.

The county road which accesses the mine site will be surfaced with a non-rutting asphalt concrete. This surface will be designed to account for the anticipated volume of traffic as well as the weight and speed of vehicles using the road.

Road Maintenance.

The access road will be maintained by Carbon County.

Road Culverts.

All culverts along the access road will be designed, installed, and maintained by Carbon County. Culverts to be installed within the surface facilities have been designed in accordance with the hydrologic criteria discussed in Section 742.300. These culverts will be installed in accordance with manufacturer's recommendations to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road.

The main access road is a public road that will be upgraded and maintained by the county. The Division does not permit county roads that are outside the disturbed area.

The Applicant did not give the Division maps and cross sections of all primary roads in the disturbed area. The Applicant did not give the Division maps and cross section of primary

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

and ancillary roads outside the disturbed area. Drawing showing that the designs for culverts located under primary roads were not included in the PAP.

In Section 542.600 of the PAP the Applicant states:

“All roads not to be retained for an approved postmining land use will be reclaimed immediately after they are no longer needed for mining and reclamation operations. Roads which will be retained through the disturbed area for access to private land within the permit area are noted on Plate 5-3. All roads to be reclaimed will be graded and/or backfilled as indicated above. Topsoil will be applied to the regraded surfaces and the area will be revegetated as discussed in Chapters 2 and 3, respectively.”

The Applicant did not provide specific information about that roads reclamation. They need to list all roads scheduled for reclamation and how they will accomplish that.

Performance standards.

The Applicant has met all the engineering performance standards for primary roads regarding location, design, construction, use and maintenance of the roads. Those engineering stands include:

- Prevent or control damage to public or private property
- Use nonacid- and nontoxic-forming substances in road surfacing
- Maintain all roads to meet the performance standards of this part and any additional criteria specified by the Division. A road damaged by a catastrophic event, such as a flood or earthquake, shall be repaired as soon as is practicable after the damage has occurred.
- The construction or reconstruction of primary roads shall be certified in a report to the Division by a qualified registered professional engineer, or in any State which authorizes land surveyors to certify the construction or reconstruction of primary roads, a qualified registered professional land surveyor, with experience in the design and construction of roads. The report shall indicate that the primary road has been constructed or reconstructed as designed and in accordance with the approved plan;
- Each primary road embankment shall have a minimum static factor of 1.3. The Division may establish engineering design standards for primary roads through

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

the State program approval process, in lieu of engineering tests, to establish compliance with the minimum static safety factor of 1.3 for all embankments;

- Primary roads shall be surfaced with 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 road certification.

The Applicant has provided certified maps and plans for the primary road design as required by R645-301-512.250

Other Transportation Facilities.

The Applicant did not describe the conveyor systems that will be used to transport coal from the portals to the coal stockpiles. R645-301-521.170 requires a detailed description of the conveyor system.

Findings:

Road classification system.

The Applicant has failed to meet the requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-527.100, classify all the roads in the permit area. The Applicant did not classify the private dirt roads in the permit area.

Plans and drawings.

The Applicant failed to meet the requirement of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-512.200. The Applicant needs to provide cross section for each of the private dirt roads. The cross sections must show that the dirt roads met the performance standards.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Performance standards.

The Applicant has met all the engineering related performance standards for roads.

Primary road certification.

The Applicant has provided certified maps and plans for the primary road design as required by R645-301-512.250

Other Transportation Facilities.

The Applicant did not describe the conveyor systems that will be used to transport coal from the portals to the coal stockpiles. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-521.170, provide a detailed description of the conveyor system used to transport coal from the portals to the coal stockpiles.

SPOIL AND WASTE MATERIALS

Analysis:

Noncoal Waste

In Section 528.300 of the PAP the Applicant states:

"Non-coal (non-waste rock) waste generated in the permit area will be temporarily stored in a dumpster to be situated at a convenient location within the disturbed area. This waste will be disposed of periodically through Carbon County at a permitted landfill.

Liquid wastes such as oil and solvents will be contained and disposed of or recycled, in accordance with applicable State and Federal regulations, at facilities which are permitted to accept such wastes. Small quantities of such wastes (e.g. resulting from cleanup or small spills, etc.) May be contained onto absorbent pads prior to disposal. In all cases, disposal and/or recycling will be only at sites which are permitted by appropriate regulatory authorities to accept such waste.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

No non-coal (non-waste rock) waste other than durable, non-acid and toxic forming, rock-type construction materials (e.g. cinder block) will be permanently disposed of within the permit area. If such waste is permanently disposed of in the permit area, it will be disposed of underground as outlined in Section 536.500 of this M&RP. If such waste is temporarily stored within the permit area prior to ultimate disposal, it will be stored either in a dumpster or in the temporary waste-rock storage area.

It is currently anticipated that no non-coal waste that is defined as hazardous under 40 CFR 261 will be generated at the mine. If such waste is generated in the future, it will be handled in accordance with the requirements of Subtitle C of the Resource Conservation and Recovery Act and any implementing regulations.

The Applicant committed in Section 528.300 of the PAP to dispose of all non-coal waste in either in state approved landfill or in an on site disposal area. The Applicant did not state where in the permit area the non-coal waste will be disposed. R645-301-528.331 requires the Applicant to designate those portions of the permit area where non-coal will be disposed. The Applicant has not met the requirements of R645-301-528.331. They must designate those portions of the permit area where non-coal waste will be disposed.

Coal Mine Waste

The Division defines coal mine waste as coal processing waste and underground development waste. Coal processing waste means earth materials separated from the coal during cleaning, concentrating, or the processing or preparation. In Section 528.300 of the PAP the Applicant states that SCM will not process their coal at the Dugout Canyon Mine beyond crushing and screening. Thus, the Applicant will generate no coal processing waste in the permit area.

The Division defines underground development waste as waste-rock mixtures of coal, shale, claystone, siltstone, limestone, or related materials that are excavated moved, and disposed of from underground workings in connection with underground coal mining and reclamation activities. In Section 528.200 of PAP the Applicant states:

Underground development waste which is generated at the Dugout Canyon Mine will be disposed of either:

- Underground within the Dugout Canyon Mine;

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

- At the approved water-rock disposal facility at the SUFCO Mine; or
- At the approved waste-rock disposal facility at the Skyline Mine

Description of the waste-rock disposal facilities at the SUFCo Mine and the Skyline Mine are provided in their respective M&RP's. A discussion of disposal of development waste in the underground workings of the Dugout Canyon Mine is provided in Section 536.500 of this M&RP.

The Applicant has not met the requirements of R645-301-536.500. Before underground disposal of coal mine waste the Applicant must first have an MSHA approved plan. Before the coal mine waste can be accepted at either the Skyline or SUFCO disposal areas those site must be permitted to accept off-site material. While the Division agrees with the ideas for coal mine we cannot approve the waste disposal approval until the proper permits are issued.

Refuse piles.

In Section 513.400 of the PAP the Applicant states:

"Waste rock generated from the Dugout Canyon Mine may be temporarily stored on the surface of the mine site at the location shown on Plate 5-2A. This storage will be for a short period of time prior to ultimate disposal either underground or in the waste-rock disposal areas associated with the SUFCo and/or Skyline Mines. The short-term nature of this storage precludes the need for special precautions related to spontaneous combustion of the stored materials. Runoff from the stored materials will drain to the site sedimentation pond.

The R645 regulations do not address temporary storage areas for underground development waste. R645-301-528 and R645-301-536 refer to refuse piles designed to be permanent disposal areas. The Division does allow some permittees to store refuse material temporarily until on site until they transport the material to a permanent facility. The request that the Applicant makes to store underground material waste on site temporarily is reasonable.

The Division is concern with the vagueness of the underground development waste temporary storage facility. The Applicant needs to define "a short period." The Division assumes that "a short period" means when a truck load of material has accumulated or every 3 months. The Applicant has not met the requirements of R645-301-121.200 because the plans for the temporary underground development waste are not clear and concise.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Impounding structures

In Section 533 of the PAP the Applicant states:

"The only impoundment that will be constructed, used, or maintained by SCCC will be the sedimentation pond at the mine surface facilities. A slope-stability analysis which was performed on this pond embankment is provided in Appendix 5-4. According to this analysis, the minimum safety factors for the sedimentation pond embankment are 4.2 under static unsaturated conditions, 2.1 under static saturated conditions, and 1.6 under seismic saturated conditions. All analyses were performed assuming that the pond was full to its maximum design depth. These safety factors exceed the minimum requirements of R645-301-533.100.

Foundation Considerations

Soils investigations have been conducted at the site of the proposed surface facilities. Results of these investigations are presented in Chapter 2 and Appendix 5-4 of this M&RP. During these investigations, foundation conditions in the area of the proposed sedimentation pond were evaluated. Based on these investigations, no conditions were encountered which suggested that the foundations upon which the pond would be constructed would be unstable. The slope-stability analyses presented in Appendix 5-4 indicate that the pond foundations will also be stable under operating conditions.

Prior to construction of the sedimentation pond, all vegetative matter and topsoil will be removed from the foundation area. Detailed cross sections of the sedimentation pond are presented on Plate 7-4 of this M&RP.

Slope Protection

The outslopes and inslopes of the sedimentation pond will be revegetated following construction to minimize surface erosion and protect the embankments against sudden drawdown. The seed mix to be used for this revegetation effort is described in Section 341.200 of this M&RP.

In the event of a storm, rapid drawdown in the sedimentation pond would be restricted to the vertical distance between the spillway and the peak water level, a distance of 0.20 foot (Plate 7-4). Drawdown of this magnitude is not considered significant and, therefore, not of erosional concern.

During normal decant of the sedimentation pond, flow rates (and drawdown) will be

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

controlled. Hence, it is unlikely that this drawdown will cause surface erosion of the embankment face.

Embankment Faces

Embankment inslopes and outslopes will be revegetated following construction of the sedimentation pond, as outlined in Section 533.300. Riprap will also be placed on the upstream face of the embankment near the discharge structure.

Highwalls

No highwalls will be located below the water lines of the sedimentation pond.

MSHA Criteria

The sedimentation pond does not meet the size criteria of 30 CFR 216(a).

Pond Operation and Maintenance Plans

The sedimentation pond has been designed in accordance with R645-301-740. Details of these designs, and the requirements for operation and maintenance of the pond, are presented in Chapter 7 of this M&RP.

The sediment pond is the only impoundment at the mine site. The sediment pond does not meet the criteria for being classified as an MSHA pond because the structure is less than 20 feet high, does not impound more than 20 acre-feet nor is the sediment pond located where failure would be expected to cause loss of life or serious property damage. Sediment ponds that do not meet the MSHA criteria have fewer stringent design and performance standards.

The designs for the sediment pond are in Appendix 7-8 of the PAP and on Plate 7-4. A registered professional engineer certified the designs and drawing.

The report on the slope stability analysis is in Appendix 5-4. The engineer that did the analysis concluded that the minimum safety factors for the sediment pond embankment are 4.2 under static unsaturated conditions, 2.1 under static saturated conditions and 1.6 under seismic saturated conditions. The safety factors for the sediment pond embankment meet or exceed the regulatory requirements of R645-301-533.100.

R645-301-533.300, requires the Applicant to protect the slope against sudden drawdown. Sudden drawdown can reduce the slope's stability by either causing

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

a buildup of pore pressures in the embankment. Sudden drawdown can occur when the sediment pond is rapidly decanted.

The Applicant's response to the rapid drawdown issue is that when a storm occurs, rapid drawdown would be restricted to the vertical distance between the spillway and the peak water level, a distance of 0.2 feet. The Applicant does not consider a drawdown of 0.2 feet to be significant. The Division agrees that a drawdown of 0.2 feet would not produce significant pore pressures in the embankment. If the Applicant decanted the pond, the sudden drawdown could cause the pore pressure in the embankment to cause stability problems.

The Applicant's response to sudden drawdown is not adequate. The Applicant must address how pore pressures in the embankment during a sudden drawdown could effect the embankments stability. The Applicant has not addressed the rapid drawdown requirements of R645-301-533.300.

Burning and Burned Waste Utilization

In Section 528.300 of the PAP the Applicant states:

If spontaneous combustion of this material (waste rock) does occur, the burning section will be removed from the remainder of the pile using a backhoe or the appropriate means. The affected waste rock will then be extinguished using water. The amount of water used in this process will be kept to a minimum to avoid excess runoff.

The Division does not recommend extinguishing burning waste rock with water. The Division recommends that the material be removed from the pile, spread so that the material can cool and if needed covered with dirt. The Applicant has not met the requirements of R645-301-528.323.1.

Return of coal processing waste to abandoned underground workings.

In Section 528.300 the Applicant states that SCM will process their coal at the Dugout Canyon Mine beyond crushing and screening. They will generate no coal processing waste on site. The Applicant does not plan on returning coal processing waste to the underground workings. The Applicant has address the requirements of R645-301-528.300.

Excess Spoil

In Section 512.200 of the Pap the Applicant states that they will generate no excess spoil from the permit area. The Applicant has met the minimum regulatory requirements for

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

handling excess spoil.

Findings:

Noncoal

The Applicant has not met the requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-528.331, The Applicant must designate those portions of the permit area where non-coal waste will be disposed.

Coal Mine Waste

The Applicant failed to meet the requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-528.321, have an MSHA approved plan to return coal mine waste to underground disposal areas.

R645-301-536.510, have the disposal facilities at Skyline and SUFCO permitted to accept coal mine waste from off-site sources.

Refuse Pile

The Applicant failed to address the requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-121.200, state in a clear and concise manner how the temporary refuse pile would be operated.

Impounding Structures

The Applicant failed to meet the minimum requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-533.300, show that the sediment pond embankment would be stable when rapid drawdown occurs.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Burning and Burned Waste Utilization

The Applicant failed to meet the minimum regulatory requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-528.323, The Applicant must address the procedures for handling coal mine waste fires.

Return of Coal Processing Waste to Abandoned Underground Workings

The Applicant met the minimum requirements for R645-301-528.300. The Applicant does not plan to return any coal processing waste underground.

Excess Spoil

The Applicant met the minimum requirements of R645-301-512.200 by committing not generate any excess spoil.

HYDROLOGIC DESIGN INFORMATION

Analysis:

Discharges into an Underground Mine

In Section 513.600 of the PAP the Applicant states that no discharges will occur from the surface to mine workings underground.

Impoundments

- In Section 533.600 of the PAP the Applicant states that the sediment pond does not meet the size criteria of 30 CFR 216(a).
- Richard White a registered professional engineer certified the designs for the sediment pond.
- The embankment stability study for the sediment pond is in Appendix 5-4. The Applicant has shown that the design had safety factors that exceed 1.3. The Applicant has met the minimum regulatory requirements.

In Section 533.200 of the PAP the Applicant states:

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

"The Applicant has conducted soil investigations at the site of the proposed surface facilities. Results of these investigations are presented in Chapter 2 and Appendix 5-4 of this M&RP. During these investigations, the Applicant evaluated foundation conditions in the proposed sedimentation pond. Based on these investigations, the Applicant encountered no conditions which suggested that the pond's foundations would be unstable. The slope-stability analysis presented in Appendix 5-4 shows that the pond foundations will also be stable under operating conditions.

Prior to construction of the sedimentation pond, all vegetative matter and topsoil will be removed from the foundation area. Detailed cross sections of the sedimentation pond are presented on Plate 7-4 of this M&RP."

The Applicant has met the minimum requirement of R645-301-533.200 to R645-301-533.220. The commitment in the PAP restates the requirement of these regulations.

In Section 533.300 of the PAP the Applicant states:

"The outslopes and inslopes of the sedimentation pond will be revegetated following construction to minimize surface erosion and protect the embankments against sudden drawdown."

In Appendix 5-4 the Applicant states that in the Sediment Pond/Access Road Stability Analysis that they assume that the soils will drain rapidly and excess pore pressure will not develop.

Vegetation does not protect the pond from sudden drawdown. Therefore the Applicant has not shown that they will protect the pond from sudden drawdown. In the stability analysis the Applicant neglects pore pressures. Since rapid drawdown can create negative pore pressures that assumption is not valid.

In Section 533.500 of the PAP the Applicant states that no highwalls are below the water lines of the sediment pond. The Division agreed with that statement and concluded that the Applicant has met the minimum requirements of R645-301- 533.500.

In Section 514.300 of the PAP the Applicant states that:

"Regular inspections will be made during construction of the sedimentation pond as well as upon completion of construction. These inspections will be made by or under the direction of a registered professional engineer experienced in the construction

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

of similar earth and water structures.”

Annual inspections of the sedimentation pond will continue until removal of the structure or release of the performance bond. A certified report of inspection will be prepared by a qualified registered professional engineer and submitted to the Division within two weeks after each inspection. The report will discuss any appearances of instability, structural weakness or other hazardous conditions, depth and elevation of any impounded waters, existing storage capacity, and existing or required monitoring procedures and instrumentation, and any other aspects of the structure affecting stability. A copy of this report will also be maintained at the mine site.

No impoundments are anticipated within the permit area that are subject to 30 CFR 77.216.”

The Applicant has committed to meet the requirements of R645-301-514.311 to R645-301-514.313. Inspections will be done during the critical phases of construction and copies of the reports will be available on site. A qualified registered professional engineer will inspect the pond annually.

Ponds, Impoundments, Banks, Dams, and Embankments

- Plate 7-4 show the sediment pond design. The plan was certified by Richard White, a registered professional engineer. The Applicant will excavate most of the pond. Part of the pond will consist of an embankment that is approximately two feet high. They did not include the specifications for the embankment in the plan. The Applicant needs to give the Division written specification for the construction of the pond. See R645-301-533.700.
- The Applicant gave the Division certified maps, and cross section of the sediment pond. Plate 7-4 shows detailed information about the sediment pond. Plate 5-2A and 5-2B also have information about the sediment pond.
- Plate 5-5 shows the areas where the Applicants anticipate subsidence. On that plate the sediment pond is outside the area of potential subsidence.

Findings:

Discharges into an Underground Mine

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

The Applicant has met the minimum regulatory requirements.

Impoundments

The Applicant has failed to meet the minimum regulatory requirement of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-533.300, demonstrate that the pond would be stable under rapid drawdown.

Ponds, Impoundments, Banks, Dams, and Embankments

The Applicant failed to meet the requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-533.700, provide the Division with certified written specification for the sediment pond.

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

Analysis:

Plate 5-2A show the location of the surface facilities. The Applicant listed the surface facilities in Sections 521.100 subsection Surface Facilities in the PAP.

In Section 526.200 of the PAP the Applicant states:

Support Facilities

Support facilities at the Dugout Canyon Mine will be operated in accordance with the permit issued for the mine. Support facilities will be located, maintained, and used in a manner that:

- Prevents or controls erosion and siltation, water pollution, and damage to public or private property;
- To the extent possible, using the best technology currently available, minimizes damage to fish, wildlife, and related environmental values; and

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

- Minimizes additional contributions of suspended solids to stream flow or runoff outside the permit area.

All support facilities will be removed following mining in accordance with the reclamation plan discussed in Section 540 of this M&RP.

Water Pollution Control Facilities

Water pollution control facilities at the Dugout Canyon Mine consist of the sedimentation pond, the appurtenant structures associated with the sedimentation pond, and the sewage disposal leach field. All water pollution control facilities will be removed following mining in accordance with the reclamation plan discussed in Section 540 of this M&RP.

The sedimentation pond and appurtenant structures will be constructed as discussed in Chapter 7 and will be used and maintained as discussed in Section 533.700. Sanitary sewage will be routed by gravity through a pipeline from the mine surface facility to the leach field at the location shown on Plate 5-2A. The sewage facilities were designed for a projected total employment of 150 persons. An operational permit has been applied for with the Utah Department of Health for use of the leach field.

Findings:

The Applicant met the minimum requirements of R645-301-526 with regards to support facilities.

SIGNS AND MARKERS

Analysis:

Mine and Permit Identification Signs

A mine and permit identification sign will be displayed at the point where the county road ends and the private road forks into the surface-facilities area. This sign will be a design that can be easily seen and read, will be made of durable material, will conform to local regulations, and will be maintained until after the release of all bonds

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

for the permit area. The sign will contain the following information:

- Mine name,
- Company name,
- Company address and telephone number,
- MSHA identification number, and
- Permanent program permit identification number as obtained from the Division.

Perimeter Markers

The perimeter of all areas affected by surface operations or facilities will be clearly marked before beginning mining activities. The markers will be a design that can be easily seen and read, will be made of durable material, will conform to local regulations, and will be maintained until after the release of all bonds for the permit area. Figure 5-2

Buffer Zone Markers

Stream buffer zone markers will be placed adjacent to Dugout Creek within the disturbed area noted on Plate 5-2A. Each buffer zone marker will be a design that can be easily seen and read, will be made of durable material, will conform to local regulations, and will be maintained until after the release of all bonds for the permit area.

Topsoil Markers

Markers will be placed on all topsoil stockpiles. These markers will be a design that can be easily seen and read, will be made of durable material, will conform to local regulations, and will be maintained until after the release of all bonds for the permit area.

The Applicant failed to commit to install mine and permit identification signs at all possible entrances to the mine site. The Applicant committed to placing such a sign only at the southern entrance to the mine site. It is possible that people could enter the mine site from other locations.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Findings:

The Applicant has failed to meet the requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-521.241, The Applicant needs to place permit identification signs at all entrances to the disturbed areas.

USE OF EXPLOSIVES

Analysis:

The Applicant states that no surface blasting will occur on the surface. Many underground coal mines in Utah do not have regular surface blasting activities. The Division does not require those mine to address the blasting and explosives regulation in detail. If the need for surface blasting should occur, the Division will require the Applicant to submit a detailed blasting plan.

Findings:

The Applicant has met the minimum regulatory requirement for the R645-301-524 regulations.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Analysis:

The Applicant has supplied the Division with maps and cross sections that show the permit area and the disturbed areas. The Applicant did not show on the Plate 5-2A Surface Facilities Plan the following:

- Power lines
- Pipe lines and buried culverts
- Surface disturbances associated with breakouts
- Topsoil storage areas
- Noncoal waste storage areas

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Certification

Analysis:

The Division has certified verifications that all maps listed under R645-301-512 will be completed when we have approved those maps.

Findings:

The findings for map certification will be done when we have approved the maps.

OPERATIONAL HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Surface-water monitoring.

Analysis:

The surface-water monitoring plan begins on page 7-58 of the application. Stream monitoring locations are found on Plate 7-1. Table 7-5 on page 7-59 provides the surface water monitoring parameters. The monitor is plan was based on the PHC.

Streams and sediment ponds will be monitored during mining operations. One stations will be established to monitor surface water downstream from the mine site and two site will be established on the forks of Dugout Creek above the mine site. These sites will be monitored quarterly for the parameters listed in Table 7-5. Others sites will be located at the Castlegate Sandstone-Blackhawk Formation contact to provide information about the relationship between the Blackhawk Formation and the base flow of Dugout Creek. These sites, as well as the above mine sites, will be monitored on above normal and below normal precipitation years as described on pages 7-58 and 7-60.

Data will be collected from the sediment pond outflow and mine water discharge as required by the UPDES permit. Data will be collected on these site until mining and reclamation activities are complete.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Surface-water data will be submitted to the Division on a quarterly base, prior to the end of each quarter in which samples are taken.

Findings:

The applicant has met the minimum requirements for surface-water monitoring during mine operations.

Discharges into an underground mine.

Analysis:

Section 731.500, page 7-61 states that there will not be any discharges into the proposed mine.

Findings:

The applicant has met the minimum requirements for discharges into an underground mine.

Gravity discharges.

Analysis:

Section 731.500, page 7-61 states that there will be no gravitational discharges from mine working. However, some water will be pumped from the mine and discharged into the stream channel.

Findings:

The applicant has met the minimum requirements for gravity discharges.

Water-quality standards and effluent limitations.

Analysis:

Water Quality standards and effluent limits are addressed in Section 751, page 7-86. This section states that "all discharges from the disturbed areas will be in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining contained in 40 CFR Part 434." SC3 will be responsible for meeting any applicable water quality regulation that applies to this mine.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Findings:

The applicant has met the minimum requirements for water-quality standards and effluent limitations.

Diversions.

Analysis:

Diversions are covered in the text of the application on pages 7-64 through 7-66 and 7-77 through 7-82. The criteria for diversions and culverts are summarized in Tables 7-8 and 7-9 on page 7-81 and 7-82, respectively. Plate 7-5 shows the location and drainage patterns throughout the proposed mine site. Appendix 7-9 holds the calculations for diversions and culverts. Appendix 7-10 is the methodology used in making the calculations. Several berms are designed to divert water off of upper pads (Appendix 7-9, page 81a) and road ditches are used to route flow from much of the disturbed area into the ponds (page 5-2 and Table 7-8).

Plate 7-5 shows a simple drainage system. There is one undisturbed ditch that routes water from the southern slopes past the disturbed area. Dugout Creek will be routed under the road, in two location, through culverts. A stream alteration permit has been applied for from the Division of Water Rights.

Essentially there is two disturbed branches, one on the north side of Dugout Creek and one on the south, that run along the road and route water into a single sediment pond. The southern branch must cross Dugout Creek at the lower Dugout Creek culvert to reach the sediment pond. Drainage on the northern side of the facilities areas is aided to the ditch by a couple berms. Several culverts are used in the disturbed drainage system.

All ditch diversions and disturbed drainage culverts have been designed to convey the 10-year, 6-hour event. The Dugout Creek culverts have been designed to convey the 100-year, 6-hour storm event.

Undisturbed drainage from the slopes northwest of the facilities area will flow into the disturbed drainage area. This extra water must be accounted for in the design of the diversions and the sediment pond. The application does not include diversion designs for the berms on the north side of the facilities.

Findings:

The applicant has met the regulatory requirements for diversions and diversion designs.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Stream buffer zones.

Analysis:

Stream buffer zones are addressed in the application on page 7-61. A large portion of the surface facilities will be located within 100 feet of Dugout Creek. The runoff and sediment control plan has been designed to ensure the operations within the buffer zone will not cause or contribute to degradation of water-quality or the stream channel quality. There will be a buffer zone designated and maintained between the mine facilities and the stream channel. The buffer zone will be marked.

Findings:

The applicant has met the minimum requirements for stream buffer zones.

Sediment control measures.

Analysis:

Sediment control measures are addressed in the application on pages 7-62 through 7-64 and 7-70 through 7-77. Appendix 7-8 covers the sediment pond design and Appendix 7-10 is the hydrologic design methodology. A sediment pond will be used as sediment control for the entire disturbed area.

Findings:

The applicant has met the minimum requirements for sediment control measures.

Sedimentation ponds.

Analysis:

There is one sediment pond used in the proposed sediment control plan. This pond is designed in Appendix 7-8 and presented in the text on pages 7-63 and 7-64, and 7-70 through 7-77. The sediment pond will be used throughout the mining operations and reclamation. It is designed to contain more than five years of sediment accumulation based on the Universal Soil Loss Equation (USLE) plus the water volume resultant from the 10-year, 24-hour storm event. The pond will be equipped with a dewatering device and a spillway.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Findings:

The applicant has met the minimum requirements for exemptions for siltation structures and sediment ponds with the exception of the deficiencies covered under the Operational Hydrology/Discharge Structures.

Exemptions for siltation structures.

Analysis:

The application shows that all surface facilities areas will be treated by a sediment pond. There will be no areas exempt from siltation structures.

Findings:

The applicant has met the minimum requirements for exemptions for siltation structures.

Discharge structures.

Analysis:

Discharge structure information is covered in the application on pages 7-68 and 7-84. The applicant says that there will be two discharge structures: the sediment pond spillway and a discharge line from the underground workings.

Appendix 7-8 contains the spillway designs and Plate 7-4 shows the detailed for the spillway. The spillway will comprise of a 24-inch steel riser with an oil-skimmer connected to an 18-inch CMP which will discharge into the creek. A figure on page 27 of Appendix 7-8 shows that a second pipe (18-inch diameter) will also empty into the main 18-inch CMP. This second pipe is labeled as the emergency spillway. The second pipe does not qualify as the emergency spillway because it is already restricted by the amount of water flowing out the primary spillway. The second pipe is a second opening to the primary spillway but is not a second spillway. The figure on page 27 of Appendix 7-8 states that the primary spillway will pass the 25-year, 6-hour storm flow and page 13 of the appendix is the calculation which support that statement.

Findings:

The discharge structure information is complete and accurate.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Impoundments.

Analysis:

The only proposed impoundment is the sediment pond. Analysis of the pond is found in the sediment pond section of this TA.

Findings:

The applicant has met the minimum requirements for impoundments.

RECLAMATION PLAN

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

The stated postmining land use is livestock grazing and wildlife habitat (Section 412.100). Final reclamation activities such as grading and seeding will be completed in a manner to provide lands able to support the postmining land use. The disturbed area was previously mined and not reclaimed to the current standards. No topsoil was saved in initial development. However, adequate substitute material should be available to support the proposed postmining land use.

The surface of the lands which will be reclaimed is owned by Sage Point, which is the parent company of SCCC. Therefore, the stated land use is that of the surface owner.

Findings:

Information found in the plan meets the minimum regulatory requirements of this section.

PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES

Regulatory Reference: 30 CFR Sec. 817.97; R645-301-333, -301-342, -301-358.

Analysis:

The plan identifies the seed mixture to be used in revegetation of the reclaimed areas. Since the postmining land use includes wildlife habitat, this mixture must be desirable for wildlife species of interest. The seed mixture provides for a variety of grass, forb and shrub species which have a high value as big game forage use. Additionally, 300 tree seedlings per acre will be planted at the time of reclamation. The transplanted trees and shrubs are Douglas fir, Rocky Mountain maple, mountain mahogany, and bitterbrush. The trees and shrubs should provide for both a food source and cover.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Reclamation of the streambanks will use the same seed mixture as the entire site. The banks will have additional trees and shrubs planted with cottonwoods, willows, and rose (Section 341.200). Planting of cottonwoods may require the use of an auger or drill in order to place the roots close to the water table.

Findings:

Information provided in the plan meets the minimum requirements of this section.

CONTEMPORANEOUS RECLAMATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.100; R645-301-352, -301-553, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

Contemporaneous reclamation activities should be well documented in the plan and monitored to determine whether or not the reclamation treatments used in the area can be proven successful. These areas can provide invaluable information as well as demonstrating by field trials that reclamation treatments will be successful. However, contemporaneous reclamation at this small site is unlikely due to the space constraints.

Findings:

Information provided in the plan meets the minimum requirements of this section.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

REVEGETATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116;
R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281,
-302-282, -302-283, -302-284.

Analysis:

General requirements.

The details of the revegetation procedures are given in Section 340. The seed mixture is specified in Section 341.200. The seed mixture is composed primarily of species native to the area and is as follows:

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

| SPECIES | DRILL RATE #PLS/ACRE | TRANSPLANTS | |
|-----------------------------|-------------------------|------------------------|----------------|
| GRASSES | | TREES | Seedlings/acre |
| Mountain brome | 3.0 | Douglas fir | 50 |
| Western wheatgrass | 5.0 | Rocky Mountain maple | 150 |
| Indian ricegrass | 2.5 | Mountain mahogany | 50 |
| Kentucky bluegrass | 2.5 | Bitterbrush | <u>50</u> |
| Bluebunch wheatgrass | 2.5 | | |
| Indian ricegrass | 2.5 | TOTAL | 300 |
| | | | |
| FORBS | | STREAMBANK ENHANCEMENT | |
| Blueleaf aster | .5 | TREES | Seedlings/acre |
| Blue flax | 1.0 | Narrowleaf cottonwood | 100 |
| Palmer penstemon | 0.5 | Willow | 100 |
| Northern sweetvetch | 1.0 | Woods rose | <u>1000</u> |
| | | | |
| SHRUBS | | | |
| Mountain big sagebrush | 1.0 | TOTAL | 2100 |
| Curl-leaf mountain mahogany | 1.0 | | |
| Snowberry | 1.0 | | |
| Utah serviceberry | <u>1.0</u> | | |
| TOTAL | 22.5 | | |

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Seed will be spread by broadcast or drill seeding methods (Section 341.200). Grasses and forbs will be spread by drill seeding on slopes less than 3:1. The shrub and tree seed will be broadcast seeded. All seeded will be broadcast seeded on slopes greater than 3:1. When seed is broadcast the seeding rate will be doubled. Slopes steeper than 3:1 will have the soil surface treated by dozer tracking or pocking by a trackhoe. Dozer tracking has not proven as successful as pocking with a trackhoe. Trackhoe pocking or creating depressions two to three feet deep and two to four feet wide has been very successful in providing water catchment basins for plant establishment. The Division highly recommends the use of any methods which creates the greatest surface roughness.

This roughened state has proven to be very important to the success of the reclamation project. Drill seeding and discing may reduce the surface roughness to an undesirable level. The operator may find at the time of reclamation that broadcast seeding will maintain the desired surface roughness. Running on contour is an important practice in revegetation operations. A commitment has been made to traverse dozers perpendicular to or on the contour of the slope.

Timing.

The plan commits to seeding late August through early October (Section 341.100). Generally, fall planting has ensured good early spring moisture for seed germination and meets the cold stratification requirements for several of the forb and shrub species. Areas which cannot be seeded during the fall window will be stabilized by seeding with an annual grain until the seeding window has opened.

Mulching and other soil stabilizing practices.

Mulch will be spread following seeding. The permit states that Division-approved mulch will be used but for bonding purposes assume that wood mulch will be used. This is somewhat confusing but acceptable that the Permittee obtain approval prior to reclamation for the specific mulch to be used. A commitment is made to use plastic netting to anchor the Division approved mulch on all slopes 3:1 or steeper. A high quality erosion control blanket is recommended on all slopes 2:1 and steeper.

Standards for success.

Section 356.100 states that the success of revegetation will be judged on the effectiveness of the vegetation for the postmining land use, and the extent of the cover in comparison to the reference area. Section 356.200 discuss success standards based on production, shrub and tree stocking densities, and cover based on surrounding area. Section 323.100 makes reference to three separate reference areas. Yet another section of the permit

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

states that SCM will meet a minimum cover standard of 37 percent. The permit must be made noncontradictory and clear as to what success standards will be met as the time of bond release. Applicable standards in R645-301-356 must be met. A method to demonstrate that the site is diverse must be proposed.

Findings:

Information found in the plan does not meet the minimum regulatory requirements of this section. Prior, to approval, the permittee must provide the following in accordance with:

R645-301-356, the permit is not clear as to what vegetation success standards will be met at the time of bond release. The application must clearly state which success standards will be used for bond release purposes. A method to demonstrate that the site has a diverse vegetative cover must be proposed.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

Analysis:

The Response to Deficiency submittal did not satisfactorily address the following deficiencies:

- Soil Borrow - Alleviate soil deficit volumes by importing soil.

Soil Borrow - Alleviate soil deficit volumes by importing soil.

Since most of the mine surface area is disturbed, the MRP shows a deficit of soil material will exist during reclamation as explained in Section 242.100 with a projected average soil replacement depth of 3.6 inches. Therefore, the MRP must identify soil borrow for making up the soil deficit. Soil replacement volumes need to be much greater than 3.6 inches and should approach an average 16 to 18 inches. Soil borrow will require locating a soil borrow area and providing all the regulatory information associated with soil borrow, including soil resource information.

Findings:

The permittee must provide the following, prior to approval, in accordance with the requirements of:

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

R645-301-232.720, The MRP shows a deficit of soil material will exist during reclamation and therefore, the MRP must identify soil borrow for making up the soil deficit. Soil replacement volumes need to be much greater than 3.6 inches and should approach an average 16 to 18 inches. Soil borrow will require locating a soil borrow area and providing all the regulatory information associated with soil borrow, including soil resource information.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Analysis:

The Applicant committed to comply with the approximate original contour provision of the R645 regulations. In Section 512.100 under the subheading of Variance From Approximate Original Contour the Applicant states:

“No variance from the approximate original contour requirements of the regulations is being requested in this M&RP.”

In Section 553.100 under the subheading of Approximate Original Contour the Applicant states:

“As indicated in Section 512.100 of this M&RP, the area of the proposed Dugout Canyon surface facilities was disturbed by previous mining activities. No pre-mining topographic maps of the area are known to exist. To the maximum extent technically practical, the site will be backfilled and graded to achieve the assumed approximate original contour and eliminate existing highwalls.”

Plate 5-3 shows the surface contours for the disturbed area after backfilling and grading have been completed. Cross sections for the reclaimed area are shown on Plate 5-4. The information in Plate 5-3 and Plate 5-4 show that the site's topography will be similar to the surrounding area. Since the site will blend in with the surrounding topography the AOC requirements have been meet.

The disturbed area has some highwalls that were made prior to SMCRA being enacted. Since the site has been disturbed the R645-301-553.600 regulations apply. Those regulations allow for highway retention when reasonably available backfill material is unavailable. The Applicant discusses reclamation of the preexisting highwalls in Section 533.100 of the PAP and the Division reviews the highwall in the backfilling and grading section of the TA.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

The Applicant did not request a variance from the AOC requirements in the PAP. However, there is a references to an AOC variance in the PAP. When the Applicant first submitted the PAP they requested an AOC variance. That request was later withdrawn but there is still a reference to the variance in the PAP that the Applicant did not remove. In Section 542.200 of the PAP the Applicant makes reference to a variance from the AOC requirements. The reference to an AOC variance is confusing and must be removed from the PAP. The Applicant has failed to meet the requirements of R645-301-121.200 by referring to an AOC variance that they did not apply for nor was granted by the Division.

Findings:

The Applicant has met the minimum requirements of R645-301-512, 301-531, 301-533, 301-553, 301-536, 301-542, with regard to the restoring the disturbed area to the approximate original contours.

The Applicant has failed to meet the requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-121.200, delete reference to an AOC variance that they did not apply for nor was granted by the Division.

BACKFILLING AND GRADING

Analysis:

General

The Applicant covers the engineering requirements for backfilling and grading in section R645-301-537, R645-301-552 and R645-301-553.

- R645-301-537 deals with regraded slopes that need special Division approval.

In Section 537 of the PAP the Applicant states:

"No mining or reclamation activities will be conducted in the permit area that require approval of the Division for alternative specifications of for steep cut slopes due to the inability of SCM to meet the regulatory requirement of R645-537.100.

All settled and revegetated fills which currently exist within the disturbed area due to historic mining in the area will be regraded during site construction

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

activities. No plan is presented in this M&RP to retain these settled and revegetated fills following reclamation.”

R645-301-537.100 deals with steep slopes associated with road cuts. The Applicant has not proposed to construct any roads with steep cut slopes. The Applicant has met the requirements of R645-301-537.100.

R645-301-537.200 applies to settled and revegetated fill. Under certain condition settled and revegetated fills do not have to be regraded during reclamation to achieve AOC. The Applicant states that they will grade all settled and revegetated fills. The Applicant has not applied for a waiver from the AOC requirements based on the settled and revegetated fills exemption. The Applicant has met the minimum requirements of R645-301-537.200.

- Section 552 deals with small depression and permanent impoundments.

R645-301-552 deals with permanent features such as small depression and permanent impoundments. The Applicant will leave small depression to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation. No permanent impoundments will be left after reclamation. The Division encourages the Applicant to leave small depression on the regrade slopes to aid in revegetation and slope stability. The Applicant has met the minimum requirements of R645-301-552.

- Section 553.100 deals with the disturbed area that the Applicant will backfill and grade.

In Section 553.100 the Applicant states:

“As indicated in Section 512.100 of this M&RP, the area of the proposed Dugout Canyon surface facilities was disturbed by previous mining activities. No pre-mining topographic maps of the area are known to exist. To the maximum extent technically practical, the site will be backfilled and graded to achieve the assumed approximate original contour and eliminate existing highwalls.”

In Section 553.500 the Applicant restates that preexisting highwall will be eliminated to the maximum practical extent. The Applicant committed to grading all slopes in the disturbed area to a minimum slope of 1.5H:1V and that the slopes will have a minimum safety factor of 1.3 (see Appendix 5-4 for details). The Applicant committed to backfill and regrade the disturbed area so the topography after reclamation will approximate the original contours.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Since the Applicant does not know what the original contours were this commitment is taken by the Division to mean that the topography of the site after reclamation will blend into the surrounding topography.

The Applicant addressed the elimination of highwalls, spoils and depressions in Section 553.100 by stating:

"The backfilling and grading plan has been designed to eliminate highwalls at the site to the maximum extent technically practical. No spoil piles exist. With the exception of the small depressions discussed in Section 552.100, no depressions will remain at the site following reclamation."

R645-301-553.120 requires that all highwalls be eliminated except in PMA (previously mine areas) and CMA (continuously mined areas). The Division will not allow the Applicant to leave highwalls because of technical limitations unless the Applicant meets the requirements of R645-301-553.600. The Applicant has not met the requirements of R645-301-553.610 because they have not demonstrated in writing to the Division that all reasonably available spoil has been used to eliminate the highwalls. The Applicant has not met the minimum requirements of R645-301-553.120 because they have not met the exclusion requirements of R645-301-555.610.

The Applicant claims that no spoil piles existed at the Dugout Canyon Mine site before the permit was issued and that no spoil piles will be created during mining and reclamation. Because no spoil piles will exist at the site the Applicant has address this issue.

The Applicant addressed slope stability of the reclaimed slopes in Section 553.100 by stating:

"Backfilled and regraded slopes have been designed to not exceed the angle of repose (determined in Appendix 5-4 to be a slope of 1.5H:1V). At this slope, final reclamation slopes have been designed with a minimum static safety factor of 2.6 (see Appendix 5-4). The static safety factor increases with decreasing slope. The slopes have thus been designed to prevent slides."

The reclaimed slope will not exceed the angle of repose and have a minimum safety factor of 1.3.

The Applicant addresses the erosion and water pollution at the site in Section 553.100 of the PAP by stating:

"Temporary sediment-control measures will be implemented during and

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

following backfilling and regrading as outlined in Section 542.200 and Section 244 of this M&RP. As vegetation becomes established on the reclaimed surfaces, erosion potentials will be further minimized. By minimizing erosion, water pollution will also be precluded. Additional water-quality concerns do not exist at the site (see Chapter 7).

In an effort to eliminate preexisting highwalls at the site following reclamation, soil will be replaced during reclamation at slopes of up to 1.5H:1V. The steepness of these slopes will be reduced at their base, providing a concave slope. As noted above, these slopes will be geotechnically stable. Dozers will be used during placement of the topsoil or substitute topsoil on these steep slopes, taking care to achieve a reasonably uniform thickness of the final soil cover. Following placement and prior to seeding, all areas with a slope steepness of 3H:1V or steeper will be deep gouged using a trackhoe. The final surface will consist of mounds and depressions capable of holding runoff and difficult to walk on. Refer to Sections 355 and 341 regarding erosion-control matting and revegetation.

Although the gouging will extend below the depth of the final topsoil layer, information presented in Section 222.400 of the M&RP indicates that the subsoils will be of acceptable chemical and physical quality, with the possible exception of the percentage of rock fragments. Hence, the surface will still be capable of sustaining an adequate vegetative cover, further minimizing long-term erosion of the slopes."

The main concern that the Division has with slopes steeper than 2H:1V is that erosion will remove the topsoil before vegetation can become established. Areas where the slope range between 1.5H:1V to 2H:1V may be susceptible to erosion. The use of concave surface on the steep slopes should minimize erosion. The Applicant addressed the engineering requirements of minimizing soil erosion and water pollution on the regraded slopes.

The Applicant committed to backfill and regrade the slopes so that they will support the approved postmining land use. The Applicant has met the minimum requirements of R645-301-553.100 to R645-301-553.150

- Section 553.200 deals with spoil and waste, refuse piles, and coal processing waste.

In Section 553.200 of the PAP the Applicant states that they will generate no spoil or coal processing waste at the mine. That information is confirmed in the Applicant's operational plan. The Applicant scheduled the refuse to be disposed in either the SUFCO or

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Skyline mines' waste rock disposal site. They schedule no refuse to be disposed on the site. The Applicant will address final disposal of refuse material from the Dugout Canyon mine in the SUFCO and Skyline mine's M&RP.

Neither SUFCO or Skyline are permitted to receive refuse material from off site operations. Therefore, the Applicant's proposal to ship refuse material off site is void because no off site facility is permitted to receive refuse material from the Dugout Mine. The Applicant has failed to address the requirements of R645-301-553.250.

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

In Section 553.300 of the PAP the Applicant states:

Exposed Coal Seams

Coal seams that were exposed during mining will be covered with a minimum of 4 feet of nontoxic and noncombustible materials during final backfilling and grading. This cover material may consist of material removed during grading of the site (see Section 542.200), subsoil, and/or topsoil.

Acid- and Toxic-Forming Materials

No acid- or toxic-forming materials exist at the site (see Section 528.300).

Combustible Materials

All combustible materials that are exposed, used, or produced during mining will be disposed of off site as outlined in Section 521.100.

In Section 542.200 of the PAP the Applicant states that:

"To the extent feasible, using available materials, coal outcrops which were exposed during the Dugout Canyon operations will be covered with at least 4 feet of soil during reclamation."

Neither R645-301-553.300 nor R645-301-542.200 allows an exemption to the 4 feet

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

cover rule for coal outcrops. Since the Applicant has not excluded any previously mined areas from the proposed disturbed all coal outcrops in the proposed disturbed area must be covered with a minimum of 4 feet of cover. The Applicant has failed to meet the minimum requirements of R645-301-553.300 and R645-301-542.200 by not committing to cover all exposed coal seams in the disturbed area with at least 4 feet of material.

Cut-and-Fill Terraces

In Section 553.400 the Applicant states:

“As indicated in Section 542.200, a terrace will be retained during final grading activities in the location indicated on Plate 5-3. The purpose of this terrace will be to provide a road for access to the private land within the permit area upstream from the reclaimed disturbed area. The road will be constructed on native or compacted soils and will slope into the hillside and drain to the reclaimed ephemeral channels that will cross at the locations noted on Plate 5-3.”

Terraces are not mentioned Section 542.200. Plate 5-3 does not show the location of any terraces. The Applicant has not stated why they need terraces for the road. Because the Applicant failed to give the Division sufficient information about where the terraces will be located or why they are need, the Division cannot approve terrace retention. The Applicant has not met the requirements of 553.400 because they failed to prove that they need terraces for the postmining land use.

Highwalls From Previously Mined Areas

In Section 553.500 of the PAP the Applicant states:

“Several highwalls currently exist within the proposed disturbed area that are the result of previous mining operations. The reclamation plan has been designed to eliminate these highwalls to the maximum extent technically practical.”

R645-301-553.500 deals with preexisting highwalls that are subject to AOC requirements. Under the AOC requirements the Applicant must eliminate all preexisting highwalls. The phrase to the maximum extent possible implies that some highwall remnants may exist after reclamation. The Applicant needs to clarify if any preexisting highwalls will remain after reclamation. If no highwalls will remain after reclamation then the Applicant must address how they will address the requirements of R645-301-553.500. If the Applicant

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

wants to retain preexisting highwalls the Applicant must receive permission from the Division. The Division can allow preexisting highwalls to be retained if the requirements of R645-301-553.600 have been met. The Applicant has not requested that preexisting highwalls be retained under the R645-301-553.600 regulations. The Applicant failed to adequately address the requirements of R645-301-553.500, if the preexisting highwalls are to be eliminated the Applicant must demonstrate that the reclaimed highwalls are stable and compatible with the postmining land use.

Previously Mined Areas

In Section 553.600 of the PAP the Applicant states:

"As noted previously, the reclamation plan has been designed to eliminate preexisting highwalls from the site following reclamation, to the maximum extent technically practical. Section 542.200 of this M&RP indicates that the plan has been designed with a reasonable balance between cut and fill quantities. Section 553.100 indicates that slopes of up to 1:5H:1V will be required to eliminate the highwalls. The steepness of these slopes will be reduced at the base to provide a concave profile. According to Appendix 5-4, these slopes will be geotechnically stable. Procedures to minimize erosion on these reclamation slopes are discussed in Section 553.100"

In Section 542.200 of the PAP the Applicant states:

"Backfilling to remove highwalls to the extent possible within the objectives noted above (cut and fill balance, site stability, and erosion control), except as allowed under a variance from approximate original contour requirements."

If the Applicant plans to leave highwalls then they must show that the requirements of R645-301-553.600 and R645-301-553.650 are met. Those regulations require that the Applicant demonstrate in writing to the Division that there is insufficient spoil to reclaim the highwalls and that the highwalls will be stable and compatible with the postmining land use. The Applicant failed to meet the requirements of R64-301-553.600 and R645-301-553.650 because they did not show that all reasonably available fill would be used to reclaim the highwalls and that the remaining will be stable and compatible with the postmining land use.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Backfilling and Grading - Thin Overburden

R645-301-553.700 is not applicable to this PAP because no surface coal mining and reclamation activities involving thin overburden will occur within the permit area.

Backfilling and Grading - Thick Overburden

R645-301-553.800 is not applicable to this PAP because no surface coal mining and reclamation activities involving thick overburden will occur within the permit area.

Regrading of Settled and Revegetated Fills

In Section 553.900 of the PAP the Applicant states:

“No regrading of settled and revegetated fills is anticipated in the permit area.”

In Section 537.200 of the PAP the Applicant states:

“All settled and revegetated fills which currently exist within the disturbed area due to historic mining in the area will be regraded during site construction activities. No plan is presented in this M&RP to retain these settled and revegetated fills following reclamation.”

The information in Section 537.200 and Section 553.900 seem contradictory. In Section 537.200 the Applicant states that there are settled and revegetated fills in the permit area. The Applicant will backfill and regrade those materials during Phase I reclamation. In Section 553.900 the Applicant states that they anticipate no regrading of settled and revegetated fills. The Applicant needs to clarify their intent regarding regrading settled and revegetated fill.

The Applicant has failed to meet the clear and concise requirements of R645-301-121.300 by not clearly stating if they would regrade the settled and revegetated fills.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Findings:

General:

The Applicant has not met the minimum requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-553.120, meet the exclusion requirements of R645-301-555.610.

R645-301-553.300, meet the requirements of R645-301-542.200 by committing to cover all exposed coal seams in the disturbed area with at least 4 feet of material.

R645-310-553.400, prove that terraces are needed for the postmining land use.

R645-301-553.500, if the preexisting highwalls are to be eliminated the Applicant must demonstrate that the reclaimed highwalls are stable and compatible with the postmining land use.

R64-301-553.600 and R645-301-553.650, show that all reasonably available fill would be used to reclaim the highwalls and that the remaining will be stable and compatible with the postmining land use.

R645-301-121.300, clearly state if they would regrade any settled and revegetated fill.

R645-301-553.250, commit to disposing of refuse only at sites that have been approved to accept material from the Dugout Canyon Mine.

Previously Mined Areas

The Applicant failed to comply with the requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-553.500 and R645-301-533.600, demonstrate that the preexisting highwalls would be eliminated or that there is insufficient spoil to reclaim the highwalls completely.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

MINE OPENINGS

Analysis:

In Section 542.700 of the PAP the Applicant states:

"All mine openings will be sealed at least 25 feet inside the mine opening. Prior to installation of the seal, all loose material will be removed from the roof, floor, and rib of the mine within 3 feet of the seal area. The seal will then be constructed using solid concrete blocks (average minimum compressive strength of 1,800 psi) with nominal dimensions of 6 inches high, 8 inches wide, and 16 inches long. Mortar will consist of one part cement, three parts sand, and no more than 7 gallons of water per sack of cement.

The seal will be recessed at least 16 inches deep into each rib and 12 inches deep into the floor. No recess will be made into the roof. In the bottom course, each block will be laid with its long axis parallel to the rib. The long axis in succeeding higher courses will be perpendicular to the long axis of the blocks in the preceding course. An interlaced pilaster will be constructed in the center.

The seals will have a thickness of approximately 16 inches. Following seal construction, the entries will be backfilled from the seal to the outside surface with soil that is sloped at the surface to match the final slope at the entry. The soil will then be raked and revegetated with the approved seed mixture (see Chapter 3).

Alternatively, a cast-in-place MSHA approved, seals will be installed with a minimum thickness of 3 feet and with a minimum compressive strength of 200 psi."

The mine opening seal plan is similar to others approved by MSHA and the Division. The Division has approved the mine opening closure plan.

Findings:

The Applicant met the minimum regulatory requirements of R645-301-542.700.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Analysis:

In Section 542.500 of the PAP the Applicant states:

"All roads not to be retained for an approved postmining land use will be reclaimed immediately after they are no longer needed for mining and reclamation operations. Roads which will be retained through the disturbed area for access to private land within the permit area are noted on Plate 5-3. All remaining roads within the disturbed area will be reclaimed. All roads to be reclaimed will be graded and/or backfilled as indicated above. Topsoil will be applied to the regraded surfaces and the area will be revegetated as discussed in Chapters 2 and 3, respectively."

The Applicant failed to mention how they will reclaim the private dirt roads in the permit area. If the dirt roads are to be left as part of the postmining land use then they must classify them as primary roads (see R645-301-527.123). The Applicant must reclaim all ancillary roads and all primary roads not approved for the postmining land use (see R645-301-527.130 and R645-301-542.600).

R645-301-527.230 requires that the Applicant have a maintenance plan that describes how they will maintain the roads through their life to meet the design standards. The Applicant has not state how they will maintain the roads in the permit area after backfilling and grading has been completed. If the Applicant proposes to leave the paved roads then the Division needs to know how the roads will be permanently maintained.

The Division prefers to have the all road pavement removed during Phase I reclamation. Over time all pavement breaks down. Roads with deteriorated pavement become more difficult to travel and maintain than dirt roads. The other alternative is for the Applicant to commit to repairing the pavement for the life of the road.

Findings:

The Applicant failed to meet the requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-527.110, classify each road in the permit area as a primary or ancillary road.

R645-301-542.600, state how they would reclaim the private dirt roads in the permit area.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

R645-301-527.200, describe how they will maintain the permanent roads in the disturbed area.

HYDROLOGIC DESIGN INFORMATION

Analysis:

Sedimentation Ponds

In Section 542.200 the Applicant states:

“The sedimentation pond will be retained for as long as practical during reclamation. Once backfilling and grading operations proceed to the location of the pond, it will be removed. Because the pond is designed primarily as an excavated structure, removal of the pond will consist primarily of backfilling. This removal will be accomplished using backhoes, loaders, dozers, and other appropriate earthmoving equipment.

As soon as regrading of an area no longer allows that area to drain to the sedimentation pond, silt fences will be installed along the base of the slopes adjacent to Dugout Canyon Creek to control erosion on an interim basis prior to revegetation success. These silt fences will be installed using a supportive backing and burying the toe of the filter fabric as noted in Figure 5-5.

On a temporary basis, straw-bale dikes may also be installed as necessary to control localized erosion prior to the establishment of revegetation efforts. If installed, locations of the straw-bale dikes will be selected to reduce sediment contributions to runoff based on field observations. Straw-bale dikes will be installed by keying the bales into the ground as noted in Figure 5-5.”

The Applicant has met the requirements of R645-301-542.400. That regulation requires that prior to abandoning a permit area or seeking bond release the all temporary structures shall be removed. The only sediment pond on a site is scheduled to be removed after all reclamation work except for replacing topsoil and seeding has occurred. According to the timetable on Figure 5-4 removing the sediment pond will occur in the later half of the eighth month of reclamation.

Reclamation of the sediment pond will be done according to the specifications outlined

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

in Section 542.200, Plan for Backfilling, Soil Stabilization, Compacting and Grading, of the PAP. According to the backfilling plan the sediment pond should be properly reclaimed.

Impoundments

There will be no permanent impoundments at the site.

Casing and Sealing of Wells

The Applicant did not address how wells would be sealed.

Findings:

The Applicant failed to meet the requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-551, address how monitoring wells would be sealed.

CESSATION OF OPERATIONS

Analysis:

In Section 515.300 of the PAP the Applicant states:

"Prior to a temporary cessation of operations within the permit area that will last for a period of 30 days or more or as soon as it is known that a temporary cessation will extend beyond 30 days, CFC will submit to the Division a notice of intention to cease or abandon operations. This notice will include the following:

- A statement of the exact number of surface acres and the horizontal and vertical extent of subsurface strata which have been affected by mining operations in the permit area prior to cessation of operations,
- A discussion of the extent and kind of reclamation activities which will have been accomplished prior to cessation of operations, and
- An identification of the backfilling, regrading, revegetation, environmental

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

monitoring, underground opening closures, and water treatment activities that will continue during the temporary cessation.

During the temporary cessation, CFC will support and maintain all surface access openings to underground operations. CFC will also secure surface facilities in areas in which there are no current operations but where future operations are to be resumed under an approved permit."

Upon the permanent cessation of coal mining and reclamation operations at the Dugout Canyon Mine, SCCC will close, backfill, or otherwise permanently reclaim all affected areas in accordance with the R645 regulations and this reclamation plan.

Surface Coal Mining and Reclamation Activities

No surface coal mining and reclamation activities will be conducted in the permit area.

Underground Coal Mining and Reclamation Activities

All surface equipment, structures, or other facilities not required for continued underground mining activities and monitoring, unless approved by the Division as suitable for the postmining land use or environmental monitoring, will be removed and the affected lands reclaimed following permanent cessation of mining operations.

Environmental Protection Performance Standards

The plan presented herein is designed to meet the requirements of R645-301 and the environmental protection performance standards of the State Program.

The Applicant has met the requirements of R645-301-515.300 for temporary cessation and R645-301-541 for permanent cessation. The Applicant will notify the Division in the event of temporary cessation and take appropriate action. When the site is permanently closed, the Applicant has committed to commence reclamation.

Findings:

The Applicant has met the requirement of R645-301-513.300 and R645-301-541.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Analysis:

Affected Area Boundary Maps

Plate 5-1 shows the location of the permit and disturbed area boundaries. Plate 5-3 gives a detailed description of the disturbed area boundaries.

Bonded Area Map

Plate 5-3 shows the areas that are covered by the reclamation bond.

Reclamation Backfilling and Grading Maps

Plate 5-3 and Plate 5-4 show the surface and cross section of the reclaimed site.

Reclamation Facilities Maps

Plate 5-3 shows the facilities in the disturbed area that will be left after final reclamation. Those facilities are the main access road and culverts. The Applicant has not addressed the roads outside the disturbed area. If any road in the permit area is used for mining or reclamation activities it must either be reclaimed or approved as a postmining feature. The Applicant has not adequately addressed how roads outside the permit area will be reclaimed.

Final Surface Configuration Maps

Plate 5-3 shows the final surface contours to the disturbed area.

Reclamation Surface and Subsurface Manmade Features Maps

The Applicant needs to show all permanent manmade surface and subsurface features on the reclamation maps. Those surface and subsurface features include transmission lines and underground pipelines.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Findings:

The Applicant has met the requirement of R645-301-541.

RECLAMATION HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Surface-water monitoring.

Analysis:

The surface-water monitoring plan begins on page 7-58 of the application. Stream monitoring locations are found on Plate 7-1. Table 7-5 on page 7-59 provides the monitoring parameters for surface water. The monitoring plan was based on the PHC. The reclamation monitoring plan is essentially the same as the operational plan. The analysis for this information is covered under the Operational Surface-Water Monitoring Plan.

Findings:

The applicant has met the minimum requirements for surface-water monitoring during mine reclamation.

Discharges into an underground mine.

Analysis:

Section 731.500, page 7-61 states that there will not be any discharges into the proposed mine.

Findings:

The applicant has met the minimum requirements for discharges into an underground mine.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Gravity discharges.

Analysis:

Section 731.500, page 7-61 states that there will not be any discharges into the proposed mine.

Findings:

The applicant has met the minimum requirements for gravity discharges.

Water quality standards and effluent limitations.

Analysis:

Water Quality standards and effluent limits are addressed in Section 751, page 7-86. This section states that "all discharges from the disturbed areas will be in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining contained in 40 CFR Part 434." SC3 will be responsible for meeting any applicable water quality regulation that applies to this mine.

Findings:

The applicant has met the minimum requirements for water-quality standards and effluent limitations.

Diversions.

Analysis:

Reclamation diversions are discussed in the application on page 5-61 and 7-88. Appendix 7-11 is the design calculations for the reclaimed drainages and Plate 5-3 shows the location of post-mining ditches. The plan states the storm criteria used in designing the reclamation ditches on page 7-47.

Findings:

The reclamation diversion section of the application is complete and accurate.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

Stream buffer zones.

Analysis:

Stream buffer zones are addressed in the application on page 7-61. A large portion of the surface facilities reclamation will be within 100 feet of Dugout Creek. The runoff and sediment control plan has been designed to ensure the reclamation within the buffer zone will not cause or contribute to degradation of water-quality or the stream channel quality. There will be a buffer zone designated and maintained between the mine facilities and the stream channel. The buffer zone will be marked.

Findings:

The applicant has met the minimum requirements for stream buffer zones.

Sediment control measures.

Analysis:

Sediment control measures for the reclamation plan are found on pages 5-55. Alternate sediment control measures are shown in Figure 5-5 on page 5-56.

The sediment pond will be removed near the end of the reclamation process. It will be retained until the regrade process reaches the location of the pond at which time it will be backfilled. When an area no longer properly drains to the sediment pond, a silt fence will be installed along the base of the slope to create alternate sediment control areas (ASCA). The silt fences will be unutilized until vegetation is successfully established to control erosion. The utilization of silt fence is the best technology currently available. However, a surface roughening technique would greatly enhance the sediment control measure and the vegetation establishment time would be hastened.

Findings:

The applicant has met the minimum requirements for exemptions for sediment control. The utilization of silt fence is the best technology currently available.

Sedimentation ponds.

Analysis:

The operational sediment pond will be utilized in the reclamation process as long as

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

possible. This design criteria for this pond is covered under the Operational Hydrology/Siltation Structures portion of this TA.

Findings:

The applicant has met the minimum requirements for exemptions for reclamation siltation structures and sediment ponds.

Exemptions for siltation structures.

Analysis:

Areas that will not report to sediment ponds are discussed under the Sediment Control in this section of the TA. Those areas are listed as alternate sediment control areas (ASCAs) and by Division policy they are not "exempt areas".

Findings:

The applicant has met the minimum requirements for exemptions for exemptions for siltation structures.

BONDING AND INSURANCE REQUIREMENTS

Analysis:

- R645-301-830.110 states that the bond amount will be determined by the Division.
- R645-301-830.130 states that the bond amount will reflect the probable difficulty of reclamation, giving consideration to such factors as topography, geology, hydrology and revegetation potential.
- R645-301-830.140 states that the bond amount will be based on, but not limited to, the detailed estimated cost. With supporting calculations for the estimates submitted by the permit applicant.

The reclamation cost estimate for the Dugout Canyon Mine is located in Appendix 5-6 of the PAP. The reclamation costs are divided into demolition, earthwork and revegetation. The Applicant supplied the enough information for the Division to determine the demolition and revegetation costs.

TECHNICAL ANALYSIS

Last Revised- August 1, 1997

The Applicant did not provide the Division with enough information to determine the earthwork costs. The Applicant supplied the Division with estimates based on based on Means. R645-301-830.130 requires that the reclamation cost estimate be based on site conditions, not a generic location. Means developed their earthwork cost estimates on a generic site that does not reflect the conditions at the Dugout Mine. The Division cannot accept the Means cost estimate because the assumption used by Means are inconsistent with R645-301-830.130.

The Division contacted Means about the accuracy of using their earthwork cost estimates. Means stated that their earthwork cost estimates should be used for budget purposes only. Bond estimates should be based on site specific conditions. The OSM handbook for reclamation cost estimates gives detailed examples on how to calculate earthwork costs. The Division will supply the Applicant with a copy of the handbook upon request.

Findings:

The Applicant has not met the requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

R645-301-830, The Applicant must give the Division detailed earthwork cost estimates.