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State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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August 22, 2001

David Miller, Resident Agent
Lodestar Energy, Inc.
HC 35 Box 370
Helper, Utah 84526

Re: Findings for the June 19, 2001 Submittal to the Midterm Review, Lodestar Energy, Inc., Horizon Mine, [redacted]MT99-4, [redacted]

Dear Mr. Miller:

The above-referenced has been reviewed and there are deficiencies that must be adequately addressed prior to approval. A copy of our Technical Analysis is enclosed for your information. In order for us to continue to process your application, please respond to this deficiency by September 28, 2001

If you have any questions, please call me at (801) 538-5325 or Wayne Western at (801) 538-5263.

Sincerely,

Daron R. Haddock
Permit Supervisor

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Enclosure:
cc: Price Field Office
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State of Utah

Utah Oil Gas and Mining

Coal Regulatory Program

Horizon Mine
Midterm Review
C/007/020-MT99-4
Technical Analysis
August 16, 2001

TABLE OF CONTENTS

INTRODUCTION 1

SUMMARY OF OUTSTANDING DEFICIENCIES 3

GENERAL CONTENTS 5
- PERMIT APPLICATION FORMAT AND CONTENTS 5

ENVIRONMENTAL RESOURCE INFORMATION 7
- FISH AND WILDLIFE RESOURCE INFORMATION 7
- SOILS RESOURCE INFORMATION 7

OPERATION PLAN 11
- FISH AND WILDLIFE INFORMATION 11
  - Protection and Enhancement Plan 12
- TOPSOIL AND SUBSOIL 12
  - Removal 13
  - Storage 13
- SPOIL AND WASTE MATERIALS 17
  - Coal Mine Waste 21
  - Excess Spoil 21
- MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS 21
  - Affected Area Maps 22
  - Mining Facilities Maps 22
  - Mine Workings Maps 23
  - Monitoring and Sample Location Maps 23

RECLAMATION PLAN 25
- APPROXIMATE ORIGINAL CONTOUR RESTORATION 25
- BACKFILLING AND GRADING 30
- TOPSOIL AND SUBSOIL 33
  - Redistribution 33
- REVEGETATION 34
  - General Requirements 34
- STABILIZATION OF SURFACE AREAS 35
- MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS 36
  - Affected area maps 37
  - Reclamation facilities maps 37
  - Reclamation monitoring and sample location maps 38
  - Reclamation surface and subsurface manmade features maps 38

TABLE OF CONTENTS

RULES INDEX 39

TECHNICAL ANALYSIS

INTRODUCTION

In accordance with R645-303-211, the Division reviews each active permit during its midterm. The review was initiated at the midpoint of the permit term on 3/23/99 for the Horizon Mine. However, because of overlapping problems with enforcement with Division Order 99B, the midterm review was put on hold for nearly a year. The Midterm Review for the Horizon Mine commenced again when the latest response from Lodestar Energy, Inc. was received on April 25, 2000. The midterm was reviewed and found deficient. The permittee resubmitted the midterm on January 12, 2001. The midterm review includes the following:

- An AVS check to ensure that Ownership and Control information is current and correct.
- A review of the plan to ensure that the requirements of all permit conditions, division orders, notice of violation abatement plans, and permittee-initiated plan changes are appropriately incorporated into the plan document.
- A review of the applicable portions of the permit to ensure that the plan contains commitments for application of the best technology currently available (BTCA) to prevent additional contributions of suspended solids to stream flows outside of the permit area.
- An evaluation of the reclamation bond to ensure that coverage adequately addresses permit changes approved subsequent to permit approval.

INTRODUCTION

SUMMARY OF OUTSTANDING DEFICIENCIES

The Technical Analysis regarding the proposed permit changes is not complete at this time, pending submittal of additional information by the Permittee and further review by the Division, to address outstanding deficiencies in the proposal. A summary of those outstanding deficiencies is provided below. Additional comments, concerns, and deficiencies may also be found withing the analysis and finding make in the Draft Technical Analysis which have not been presented in this summary. Upon finalization of this review, any outstanding deficiencies will be evaluated for compliance with the regulatory requirements. Such deficiencies may be conditioned to the requirements of the permit issued by the Division, result in denial of the proposed permit changes, or may result in other executive or enforcement actions as deemed necessary by the Division at that time to achieve compliance with the Utah Coal Regulatory Program.

Accordingly, the permittee must address those deficiencies as found within this Draft Technical Analysis and provide the following, prior to approval, in accordance with the requirements of:

R645-301-121.300, The Permittee must give the Division copies of the midterm response that can be directly incorporated into the approved MRP. 5

R645-301-231.400, Please state in the narrative of Chapter 8 or as a footnote to Table 8-4 that Plate 3-7b has the cross-sections which support the information in Table 8-4. 17

R645-301-231.400, R645-301-120 and R645-301-130, 234.200, A drastic difference in stockpile volumes has been presented in this submittal, please explain in the narrative (Section 8.8.1) that a loss of over 8,000 cubic yards of material occurred some time during culvert repair and portal construction in 1999. 17

R645-301-234.300, For topsoil protection, topsoil storage areas should be labeled on Plate 3-1 Surface Facilities Map. 17

R645-301-240, Place a commitment in the plan to employ a qualified soil scientist at the time of reclamation backfilling to evaluate the soil excavated (especially around the concrete portal covers (as shown on Plate 3-7) with the aim of increasing cover from an average of 10 inches to an average approaching 20 inches. 17

R645-301-244.320, The plan must include a commitment as follows: rills and gullies which form in areas that have been regraded and topsoiled and which either disrupt the approved post-mining land use or the reestablishment of the vegetative cover, or, cause or contribute to a violation of water quality standards for receiving streams, shall be filled, regraded, or otherwise stabilized; topsoil shall be replaced; and the areas shall be reseeded or replanted. 36

R645-301-353.100, Plate 3-7 is not correct and must be changed. No final reclamation has occurred on site. Either the map must be changed or the Operator may provide detailed information on the reclamation of these areas showing all the requirements and performance standards of the regulations have been met for final reclamation. 35

GENERAL CONTENTS

PERMIT APPLICATION FORMAT AND CONTENTS

Regulatory Reference: 30 CFR 777.11; R645-301-120.

Analysis:

The redline-strike-out pages provided in this response do not fit into the approved MRP. The wording in the midterm response does not flow correctly from one page to the next. Prior to approval, the permittee must give the Division copies of the midterm response that can be directly incorporated into the MRP.

Findings:

The information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the permittee must be provided the following in accordance with:

R645-301-121.300, The permittee must give the Division copies of the midterm response that can be directly incorporated into the approved MRP.

GENERAL CONTENTS

ENVIRONMENTAL RESOURCE INFORMATION

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

FISH AND WILDLIFE RESOURCE INFORMATION

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

Minimum Regulatory Requirements:

The application shall include fish and wildlife resource information for the permit area and adjacent area. The scope and level of detail for such information shall be determined by the Division in consultation with State and Federal agencies with responsibilities for fish and wildlife and shall be sufficient to design the protection and enhancement plan required under the operation and reclamation plan.

Site-specific resource information necessary to address the respective species or habitats shall be required when the permit area or adjacent area is likely to include:

(1) Listed or proposed endangered or threatened species of plants or animals or their critical habitats listed by the Secretary under the endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), or those species or habitats protected by similar State statutes;

(2) Habitats of unusually high value for fish and wildlife such as important streams, wetlands, riparian areas, cliffs supporting raptors, areas offering special shelter or protection, migration routes, or reproduction and wintering areas; or

(3) Other species or habitats identified through agency consultation as requiring special protection under State or Federal law.

Analysis:

The permit states (page 10-4) a spring (late May/early June) and fall (September/October) macroinvertebrate surveys will be done in the North Fork of Gordon Creek, by a qualified person, on standardized dates beginning in spring 2001. The surveys will be done every year for three years and then every other year after that. On each sampling date, samples will be taken from a site 0.5 to 1.0 mile above the confluence of Jewkes Creek and the North Fork of Gordon Creek, and a similar distance below the confluence of those streams. The Division will be notified prior to survey.

Findings:

The proposed changes to the MRP meet the requirements of this section.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

Minimum Regulatory Requirements:

Provide adequate soil survey information on those portions of the permit area to be affected by surface operations or facilities consisting of a map delineating different soils, soil identification, soil description, and present and potential productivity of existing soils.

Where selected overburden materials are proposed as a supplement or substitute for topsoil, provide results of the analysis, trials and tests required. Results of physical and chemical analyses of overburden and topsoil must be provided to demonstrate that the resulting soil medium is equal to or more suitable for sustaining revegetation than the available topsoil, provided that trials and tests are certified by an approved laboratory. These data may be obtained from any one or a combination of the following sources: U.S. Department of Agriculture Soil Conservation Service published data based on established soil series; U.S. Department of Agriculture Soil Conservation Service Technical Guides; State agricultural agency, university, Tennessee Valley Authority, Bureau of Land Management or U.S. Department of Agriculture Forest Service published data based on soil series properties and behavior; or, results of physical and chemical analyses, field site trials, or greenhouse tests of the topsoil and overburden materials (soil series) from the permit area. If the permittee demonstrates through soil survey or other data that the topsoil and unconsolidated material are insufficient and substitute materials will be used, only the substitute materials must be analyzed.

Analysis:

Soil resources are described in Chapter 8, Sections 8.1 through 8.3 and located on Plate 8-1 and Plate 8-2. The soil resource was surveyed in 1990 for the Blue Blaze Mine at the Order II scale by the Soil Conservation Service (Henry Sauer, personal communication with Leland Sasser USDA/SCS, 1991). Twelve pits were sampled and seven pits were surveyed for horizon identification, soil descriptions, and physical/chemical properties. Mapped soils were correlated with the following currently recognized soil series or complexes:

JIB	Brycan Loam-fine-loamy, mixed Cumulic Haploborolls
GIG	Curecanti Family - loamy - skeletal, mixed Typic Argiborolls
no symbol	Rabbitex Site Loam 15 to 50 percent slope-fine-loamy, mixed Typic Calciborolls
HIG	Senchert Loam-fine-loamy, mixed Argic Pachic Cryoborolls
FIA	Shupert-Winetti Complex-loamy-skeletal, mixed (calcareous), frigid Typic Ustifluvent.

The soils within the proposed disturbance are primarily colluvium, alluvium, and residuum derived from sandstone, shale, limestone, and siltstone. The majority of the disturbed area is within the Brycan Series (A horizon = 34 - 43 inches) and the Shupert-Winetti Complex (A horizon = 0 - 10 inches). The soils tend to be silty clay loam to loam within the Shupert-Winetti Complex and gravelly loam within the Brycan.

The soil capability classification ranges from III-e3 irrigated to VII-e non-irrigated. Under native vegetation, the water erosion hazard associated with these soils is slight to moderate. When disturbed, the erosion hazard is moderate. The soils are generally deep, well-drained, and moderately permeable. The pH of the surface horizon ranges from 7.2 to 8.0. The Electrical Conductivity (EC) ranges from 0.4 to 1.2 mmhos/cm. The depths of reported A horizon range from 0 for the Shupert-Winetti Complex to 43 inches for the Brycan Serives. Soil

profile depths generally ranged form 60 to 70 inches. Test pit 1 shown on Plate 8-1 had a high content of clay (43%) in the top 30 inches. Coarse rock fragment contents were also found during the Order II Survey, but the Division does not consider the rock content as a limiting factor for soil salvage and/or replacement.

During 1990, the excavation and analysis of refuse/coal waste material in pit #8 (location shown on Plate 8-1) revealed levels of Boron at 4.8 mg/kg (0 -12 inches) and 5.19 mg/kg (10 - 11 feet deep). Boron which exceeds 5 mg/kg is considered unsuitable growth medium and must be covered with a minimum of four feet of suitable growth medium. To verify the suspect Boron levels, three additional soil pits were excavated in the embankment area located southwest of the portals during 1996. None of the samples showed elevated levels of Boron.

The 1996 profile descriptions of the embankment southwest of the portals portray layered coal debris, coal waste, rock fragments, and disturbed soils from previous mining operations. One pit sample showed an Acid/Base Potential (ABP) of -1.16 tons $CaCO_3$/1000 tons material. This value approaches the Division's cutoff limit for ABP at -5 tons $CaCO_3$/1000 tons. Overall, the concentration of coal in the spoil sampled makes the material undesirable for use in the surface fill. The coal and coal waste materials from the embankment will be used as backfill in the facilities area and covered with at least four feet of acceptable backfill material as described in Section 3.3.2.5.

An additional survey of Jewkes Creek soils was also conducted in 1996, when three soil pits were excavated in the lower facilities area (TP43 & 44 and 45). The first pit (TP43) was located in the bottom of Jewkes Creek channel while the second pit (TP44) was located on top of the west bank of the Jewkes Creek drainage. Although previously disturbed, sample results indicate that soils in both areas would be acceptable as substitute topsoil and/or backfill with the exception of the coal fines layer in the Jewkes Creek channel. The Jewkes Creek channel soils are unique since they have a fluvial origin which terminates at bedrock twelve feet below. The material consists mainly of sandy loam inter-bedded with coal fines (≈30 %) and loam, less than 10% rocks and no coarse fragments. A log of Test Pit 45 is found in Appendix 8-1 and located on Plate 8-1. The NRCS report of this pit indicates that the soils met the wetland criteria for hydric soil development in a small, narrow area, about 5 - 20 feet wide. The wetland area starts near where the small stream flows near the rock face and continues along the rock face and ends before the stream enters the culvert. The hydric soil was classified as coal mixed (calcareous) frigid Aeric Fluvaquents.

Findings:

The information provided meets the minimum environmental soil resource requirements of the Regulations. Soil descriptions for #63, Midfork family-Podo association; #72, Pathead-Curecanti family association; #107, Shupert-Winetti complex; #109 Silas-Brycan loams; #124, Uinta family-Podo association are found in Chapter 8.

OPERATION PLAN

FISH AND WILDLIFE INFORMATION

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

Minimum Regulatory Requirements:

Protection and enhancement plan

Each application shall include a description of how, to the extent possible using the best technology currently available, the operator will minimize disturbances and adverse impacts on fish and wildlife and related environmental values, including compliance with the Endangered Species Act, during the surface coal mining and reclamation operations and how enhancement of these resources will be achieved where practicable. This description shall apply, at a minimum, to species and habitats identified. The description shall include: protective measures that will be used during the active mining phase of operation. Such measures may include the establishment of buffer zones, the selective location and special design of haul roads and powerlines, and the monitoring of surface water quality and quantity; and, enhancement measures that will be used during the reclamation and postmining phase of operation to develop aquatic and terrestrial habitat. Such measures may include restoration of streams and other wetlands, retention of ponds and impoundments, establishment of vegetation for wildlife food and cover, and the placement of perches and nest boxes. Where the plan does not include enhancement measures, a statement shall be given explaining why enhancement is not practicable.

Each operator shall, to the extent possible using the best technology currently available: ensure that electric powerlines and other transmission facilities used for, or incidental to, underground mining activities on the permit area are designed and constructed to minimize electrocution hazards to raptors, except where the Division determines that such requirements are unnecessary; locate and operate haul and access roads so as to avoid or minimize impacts on important fish and wildlife species or other species protected by State or Federal law; design fences, overland conveyors, and other potential barriers to permit passage for large mammals except where the Division determines that such requirements are unnecessary; and, fence, cover, or use other appropriate methods to exclude wildlife from ponds which contain hazardous concentrations of toxic-forming materials.

Endangered and threatened species

No underground mining activity shall be conducted which is likely to jeopardize the continued existence of endangered or threatened species listed by the Secretary or which is likely to result in the destruction or adverse modification of designated critical habitats of such species in violation of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The operator shall promptly report to the Division any State- or federally-listed endangered or threatened species within the permit area of which the operator becomes aware. Upon notification, the Division shall consult with appropriate State and Federal fish and wildlife agencies and, after consultation, shall identify whether, and under what conditions, the operator may proceed.

Bald and golden eagles

No underground mining activity shall be conducted in a manner which would result in the unlawful taking of a bald or golden eagle, its nest, or any of its eggs. The operator shall promptly report to the Division any golden or bald eagle nest within the permit area of which the operator becomes aware. Upon notification, the Division shall consult with the U.S. Fish and Wildlife Service and also, where appropriate, the State fish and wildlife agency and, after consultation, shall identify whether, and under what conditions, the operator may proceed.

Nothing in these regulatory requirements shall authorize the taking of an endangered or threatened species or a bald or golden eagle, its nest, or any of its eggs in violation of the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq., or the Bald Eagle Protection Act, as amended, 16 U.S.C. 668 et seq.

Wetlands and habitats of unusually high value for fish and wildlife

The operator conducting underground mining activities shall avoid disturbances to, enhance where practicable, restore, or replace, wetlands and riparian vegetation along rivers and streams and bordering ponds and lakes. Underground mining activities shall avoid disturbances to, enhance where practicable, or restore habitats of unusually high value for fish and wildlife.

Analysis:

Protection and Enhancement Plan

The Plan (page 10-38) states that Horizon will monitor road kills and report numbers quarterly to the DWR, and remove killed deer and elk from the road between the Wildcat Coal Loadout and the mine site. Appendix 10-1 reports road kills for 1997 through 2000. As stated in a previous review, a commitment should be made in the MRP to report numbers of road kills and kills removed from the road in the **Annual Reports**.

As part of a mitigation program, the Operator is to recreate a riparian vegetative community along Jewkes Creek channel below the sediment pond to the road. The channel was reconstructed during road construction activities. During the site inspection, completed revegetation work was observed; however, the success of that work could not be evaluated due to the early season.

Findings:

Information found in the plan and on site relevant to this midterm review have been resolved to be consistent with the requirements of this section.

TOPSOIL AND SUBSOIL

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

Minimum Regulatory Requirements:

Topsoil removal and storage

All topsoil shall be removed as a separate layer from the area to be disturbed, and segregated. Where the topsoil is of insufficient quantity or of poor quality for sustaining vegetation, the selected overburden materials approved by the Division for use as a substitute or supplement to topsoil shall be removed as a separate layer from the area to be disturbed, and segregated. If topsoil is less than 6 inches thick, the operator may remove the topsoil and the unconsolidated materials immediately below the topsoil and treat the mixture as topsoil.

The Division may choose not to require the removal of topsoil for minor disturbances which occur at the site of small structures, such as power poles, signs, or fence lines; or, will not destroy the existing vegetation and will not cause erosion.

All materials shall be removed after the vegetative cover that would interfere with its salvage is cleared from the area to be disturbed, but before any drilling, blasting, mining, or other surface disturbance takes place.

Selected overburden materials may be substituted for, or used as a supplement to, topsoil if the operator demonstrates to the Division that the resulting soil medium is equal to, or more suitable for sustaining vegetation than, the existing topsoil, and the resulting soil medium is the best available in the permit area to support revegetation.

Materials removed shall be segregated and stockpiled when it is impractical to redistribute such materials promptly on regraded areas. Stockpiled materials shall: be selectively placed on a stable site within the permit area; be protected from contaminants and unnecessary compaction that would interfere with revegetation; be protected from wind and water erosion

through prompt establishment and maintenance of an effective, quick growing vegetative cover or through other measures approved by the Division; and, not be moved until required for redistribution unless approved by the Division.

Where long-term surface disturbances will result from facilities such as support facilities and preparation plants and where stockpiling of materials would be detrimental to the quality or quantity of those materials, the Division may approve the temporary distribution of the soil materials so removed to an approved site within the permit area to enhance the current use of that site until needed for later reclamation, provided that: such action will not permanently diminish the capability of the topsoil of the host site; and, the material will be retained in a condition more suitable for redistribution than if stockpiled.

The Division may require that the B horizon, C horizon, or other underlying strata, or portions thereof, be removed and segregated, stockpiled, and redistributed as subsoil in accordance with the above requirements if it finds that such subsoil layers are necessary to comply with the revegetation.

Analysis:

Removal

Soil plan for removal is given in Section 8.7 of the MRP. The island method of removal was used to salvage topsoil and substitute topsoil from locations identified on Figure 8-2, Growth Medium Removal Locations and the accompanying Table 8-3 Potential Topsoil/Growth Medium Available for Salvage. A target volume of 13,670 cubic yards was set. That goal was superceded and approximately 15,000 cubic yards was salvaged and stored in the topsoil stockpile in November of 1996 (see the EarthFax Engineering Inc. report in Appendix 8-1 entitled, "Horizon Mine Soil Salvage Practices, Fall, 1996, December 1996").

Plate 8-1, Soils, provides information on soil types for the mine site. Sections 8.3.1 and 8.3.2 provide a soil identification and descriptions. Table 8-3 presents the recommended depth of stripping and can be used for future reference. Although, Section 8.11 indicates that no additional surface disturbance involving soils will be required for the surface facilities.

Storage

Topsoil is stored in four locations for reclamation of the Horizon Mine. The following discussion of the volumes of topsoil available for reclamation of the 4.04 acres at the Horizon mine will be in order of the four storage locations:

1. The topsoil pile that was created in November of 1996;
2. In-place soils from areas 10 & 11 (beneath topsoil pile);
3. Areas D & E on Plate A, Appendix 8-1 hold 779 cubic yards of topsoil soil in a layer 20-inches deep (according to the January 2001 submittal section 3.5.2);
4. (As a last resort) the slopes of Areas A, B, and C which hold 975 cubic yards from the county road construction in a layer 11-inches deep (according to the existing MRP section 8.8.1).

Topsoil Stockpile (2,458 cubic yards)

At its creation, the topsoil pile stored 10,494 cubic yards (Appendix 8-1, Topsoil Stockpile Table). The topsoil stockpile was surveyed in May of 1997 and again in September/October of 1997. In 1998, replacement of a culvert beneath the pile resulted in the loss of over 8,000 cubic yards of topsoil material (as described in Section 8.8.1 of the MRP). Furthermore, the narrative on page 8-27 in Section 8.8.1 Resoiled Areas explains that,

> *"During mine construction in 1996/1997 and after the removal of topsoil/growth media, Mr. Brad Derrick, P.E. determined that the Portal Canyon pad area was 6 to 8 feet higher in elevation than the portal openings. As a result of this discovery, the pad area was regraded in 1997 and the materials were distributed to various locations within the disturbed area boundary. Contours on Plate A (Topsoil Growth Medium Distribution) within Appendix 8-1 reflect the pad regrading and placement of the soils."*

This submittal confirms that loss with the information presented in Table 8-4, "1999 Topsoil Quantity Table (Pit Survey of Recovered Material)." The results of the soil survey conducted in November of 1999 suggest (by Division calculations) that 2,429 cubic yards of topsoil remain in the stockpile.

The volume of topsoil in the topsoil pile was also calculated using the difference between operating contours and proposed reclamation contours from Survcadd calculated volumes. Plate 3-7b Topsoil Storage Area shows the information generated. The calculated volume of topsoil is 2,458 cubic yards (which closely matches the Division calculations from the 1999 survey). The narrative states that this is a conservative estimate based upon a flat bottom, since no measurements were taken of the original stream channel. Cross-sections supporting Table 8-4 are provided as Plate 3-7b of this submittal. (Plate 3-7b is referred to in Appendix 8-1 Topsoil Stockpile Table, but not on Table 8-4 or in the narrative.)

Pre-mining contour maps were not used to develop an estimate of topsoil storage. Both Plate 3-6, Pre-Mining Topography, and Plate 3-2, Pre-mining and Operational Cross-Sections, were created in 1996 by EarthFax, Inc. These maps have been determined by Lodestar Energy, Inc. to be of little value, since the elevations reported do not match the ground conditions as surveyed in the year 2000, even for the undisturbed slopes of Portal Canyon. As a result, the topsoil stockpile elevation was higher than the portal elevation and so the difference between operational elevation and pre-mining elevation was negative (no soil stored). In 1999, when Lodestar Energy, Inc. attempted to utilize the information on the maps and simply lower the elevations by a common amount, there were only a few points of correlation with the existing surveyed pad elevations. Lodestar Energy, Inc. prefers to utilize Plate 3-2, Pre-mining and Operational Cross-Sections, for its information about the shape of Portal Canyon prior to mining, rather than for precise elevation information.

In Place Soils (3,086 cubic yards)

The current MRP in Appendix 8-1, Topsoil Stockpile Table, indicates that 3,733 cubic yards of soil buried by the topsoil pile will be available for final reclamation. This submittal reduces that number down to 3,086.

Areas D & E (156 cubic yards)

The Division approved of the temporary distribution of topsoil materials to Areas D & E within the permit area to enhance the current use of those areas until needed for later reclamation. This layering of topsoil on the slopes was conducted under R645-301-234.300, under the conditions that such action would not permanently diminish the capability of the topsoil of the host site; and, that the material would be retained in a condition more suitable for redistribution than if stockpiled.

The current MRP in Appendix 8-1 Topsoil Stockpile indicates that Area D shown on Plate A of Appendix 8-1 received 499 cubic yards of topsoil.

The current MRP indicates Area E received 156 cubic yards of riparian soil and 124 cubic yards of other topsoil, for a total of 280 cubic yards.

This submittal indicates that only Area E will be redisturbed to supply 156 cubic yards of soil for reclamation. The remaining slopes will remain untouched during final grading.

Areas A, B, and C

Areas A, B, and C received 975 cubic yards of topsoil material during county road construction. The current MRP indicates that this material is available as needed upon reclamation. This submittal indicates that Areas A, B, and C will not be redisturbed during final reclamation, and topsoil from Areas A, B, and C has not been included in the revised Appendix 8-1, Topsoil Stockpile Table.

Topsoil Storage Summary

In conclusion, Horizon mine has reduced its storage of topsoil available for mine site reclamation from 14,507 cubic yards down to 5,700 cubic yards. Consequently, the depth of coverage has also been reduced from twenty inches down to ten inches of cover. The area to receive topsoil cover has also been reduced from 5.49 to 4.04 acres due to the hillside west of the portals being labeled "contemporaneous reclamation." The figure of 4.04 acres has been noted in the revised Topsoil Stockpile Table in Appendix 8-1.

The drastic difference in volumes between the approved MRP and this submittal is most probably due to redistribution of soil from the topsoil pile into the backfill of the portals (personal communication on August 13, 2001, with Mr. Robert Davidson, former Division Soil Scientist). An explanation of this supposition would fit well into the narrative in Section 8.8.1 wherein the loss of soil due to the crushed culvert is described as is the regrading and redistribution of material to various locations within the disturbed area boundary.

To generate more material for topsoil cover at final reclamation, Horizon mine could utilize an additional 623 cubic yards from Areas D & E and 975 cubic yards from areas A, B, and C to bring the total to 7,298 cubic yards of topsoil material available at final reclamation. However, utilizing this material would provide only 2 more inches of cover depth (13 inches rather than 11 inches as specified in the submittal) over the total area of 4.04 acres. Imposing the original reclamation plan (for Areas A - E) upon the site will not generate enough material to make a difference in the final reclamation.

Rather, to generate more material for topsoil cover at final reclamation, the Division would prefer that a qualified soil scientist is employed at the time of reclamation to ascertain whether material excavated for concrete portal covers (as shown on Plate 3-7) is useful as topsoil. The Division requests that there is a commitment in the plan to employ a qualified soil scientist at the time of reclamation to determine where the best available soil material is for cover. This commitment is particularly important when one realizes the extent of effort that was made to gather all the best available material from within the disturbed area into the topsoil pile at the time of its creation. In other words, the material left in the pad is much less desirable than that which was removed, stored in the topsoil pile and subsequently lost.

Slopes in the disturbed area which have been dressed with topsoil and seeded in accordance with R645-301-234.300 (Plate A, Appendix 8-1 and Plate 3-7) have been designated as either "interim reclamation/topsoil storage areas" or "contemporaneous reclamation areas" on the Plate 3-7, Reclamation Topography. (Slopes which will not be redisturbed during final reclamation should receive a final seeding and planting according to the plan and should be designated as contemporaneous reclamation areas on Plate 3-7. Please refer to the analysis and deficiency written under section R645-301-353.100 for more detail.)

Interim reclamation/topsoil storage areas

On site, interim reclamation/topsoil storage areas will be designated with signs. As described in section 3.5.1, sediment control on these topsoiled slopes will consist of a mulch mat installed one foot above and below the cut bank.

Areas reported on Plate 3-7 as "topsoil storage on interim slopes" should also be shown on Plate 3-1, Surface Facilities.

Findings

Information provided in the proposed amendment is not considered adequate to meet minimum topsoil/subsoil operations requirements of the Regulations. Prior to approval, the permittee must provide the following in accordance with:

R645-301-231.400, Please state in the narrative of Chapter 8 or as a footnote to Table 8-4 that Plate 3-7b has the cross-sections which support the information in Table 8-4.

R645-301-234.300, For topsoil protection, topsoil storage areas should be labeled on Plate 3-1 Surface Facilities Map.

R645-301-231.400, R645-301-120 and R645-301-130, 234.200, A drastic difference in stockpile volumes has been presented in this submittal, please explain in the narrative (Section 8.8.1) that a loss of over 8,000 cubic yards of material occurred some time during culvert repair and portal construction in 1999.

R645-301-240, Place a commitment in the plan to employ a qualified soil scientist at the time of reclamation backfilling to evaluate the soil excavated (especially around the concrete portal covers as shown on Plate 3-7) with the aim of increasing cover from an average of 10 inches to an average approaching 20 inches.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Minimum Regulatory Requirements:

Coal mine waste

Each plan shall contain descriptions, including appropriate maps and cross-section drawings of the proposed disposal methods and sites for placing underground development waste and excess spoil generated at surface areas affected by surface operations and facilities. Each plan shall describe the geotechnical investigation, design, construction, operation, maintenance, and removal, if appropriate, of the structures.

All coal mine waste shall be placed in new or existing disposal areas within a permit area that are approved by the Division for this purpose. Coal mine waste shall be placed in a controlled manner to:

(1) Minimize adverse effects of leachate and surface-water runoff on surface- and ground-water quality and quantity;

(2) Ensure mass stability and prevent mass movement during and after construction;

(3) Ensure that the final disposal facility is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use;
(4) Not create a public hazard; and
(5) Prevent combustion.

Coal mine waste materials from activities located outside a permit area may be disposed of in the permit area only if approved by the Division. Approval shall be based upon a showing that such disposal will be in accordance with the standards of this section.

The disposal facility shall be designed using current, prudent engineering practices and shall meet any design criteria established by the Division. A qualified registered professional engineer, experienced in the design of similar earth and waste structures, shall certify the design of the disposal facility. The disposal facility shall be designed to attain a minimum long-term static safety factor of 1.5. The foundation and abutments must be stable under all conditions of construction. Sufficient foundation investigations, as well as any necessary laboratory testing of foundation material, shall be performed in order to determine the design requirements for foundation stability. The analyses of the foundation conditions shall take into consideration the effect of underground mine workings, if any, upon the stability of the disposal facility.

If any examination or inspection discloses that a potential hazard exists, the Division shall be informed promptly of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented the Division shall be notified immediately. The Division shall then notify the appropriate agencies that other emergency procedures are required to protect the public.

Excess Spoil: General Requirements

Excess spoil shall be placed in designated disposal areas within the permit area, in a controlled manner to: minimize the adverse effects of leachate and surfacewater runoff from the fill on surface and ground waters; ensure mass stability and prevent mass movement during and after construction; and, ensure that the final fill is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use.

The fill and appurtenant structures shall be designed using current, prudent engineering practices and shall meet any design criteria established by the Division. A qualified registered professional engineer experienced in the design of earth and rock fills shall certify the design of the fill and appurtenant structures. The fill shall be designed to attain a minimum long-term static safety factor of 1.5. The foundation and abutments of the fill must be stable under all conditions of construction.

The disposal area shall be located on the most moderately sloping and naturally stable areas available, as approved by the Division, and shall be placed, where possible, upon or above a natural terrace, bench, or berm, if such placement provides additional stability and prevents mass movement.

Sufficient foundation investigations, as well as any necessary laboratory testing of foundation material, shall be performed in order to determine the design requirements for foundation stability. The analyses of foundation conditions shall take into consideration the effect of underground mine workings, if any, upon the stability of the fill and appurtenant structures. When the slope in the disposal area is in excess of 2.8h:1v (36 percent), or such lesser slope as may be designated by the Division based on local conditions, keyway cuts (excavations to stable bedrock) or rock toe buttresses shall be constructed to ensure stability of the fill. Where the toe of the spoil rests on a downslope, stability analyses shall be performed to determine the size of rock toe buttresses and keyway cuts.

All vegetative and organic materials shall be removed from the disposal area prior to placement of excess spoil. Topsoil shall be removed, segregated and stored and redistributed in accordance with the requirements for topsoil handling. If approved by the Division, organic material may be used as mulch or may be included in the topsoil to control erosion, promote growth of vegetation, or increase the moisture retention of the soil.

Excess spoil shall be transported and placed in a controlled manner in horizontal lifts not exceeding 4 feet in thickness; concurrently compacted as necessary to ensure mass stability and to prevent mass movement during and after construction; graded so that surface and subsurface drainage is compatible with the natural surroundings; and covered with topsoil or substitute material. The Division may approve a design which incorporates placement of excess spoil in horizontal lifts other than 4 feet in thickness when it is demonstrated by the operator and certified by a qualified registered professional engineer that the design will ensure the stability of the fill and will meet all other applicable requirements.

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

No permanent impoundments are allowed on the completed fill. Small depressions may be allowed by the Division if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation; and if they are not incompatible with the stability of the fill.

Excess spoil that is acid- or toxic-forming or combustible shall be adequately covered with nonacid, nontoxic and noncombustible material, or treated, to control the impact on surface and ground water, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved postmining land use.

If the disposal area contains springs, natural or manmade water courses, or wet weather seeps, the fill design shall include diversions and underdrains as necessary to control erosion, prevent water infiltration into the fill, and ensure stability. Underdrains shall consist of durable rock or pipe, be designed and constructed using current, prudent engineering practices and meet any design criteria established by the Division. The underdrain system shall be designed to carry the anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area and shall be protected from piping and contamination by an adequate filter. Rock underdrains shall be constructed of durable, nonacid-, nontoxic-forming rock (e.g., natural sand and gravel, sandstone, limestone, or other durable rock) that does not slake in water or degrade to soil materials, and which is free or coal, clay, or other nondurable material. Perforated pipe underdrains shall be corrosion resistant and shall have characteristics consistent with the long-term life of the fill.

Slope protection shall be provided to minimize surface erosion at the site. All distributed areas, including diversion channels that are not riprapped or otherwise protected, shall be revegetated upon completion of construction.

A qualified registered professional engineer or other qualified professional specialist under the direction of the professional engineer, shall periodically inspect the fill during construction. The professional engineer or specialist shall be experienced in the construction of earth and rock fills. Such inspections shall be made at least quarterly throughout construction and during critical construction periods. Critical construction periods shall include at a minimum: foundation preparation, including the removal of all organic material and topsoil; placement of underdrains and protective filter systems; installation of final surface drainage systems; and, the final graded and revegetated fill. Regular inspections by the engineer or specialist shall also be conducted during placement and compaction of fill materials. The qualified registered professional engineer shall provide a certified report to the Division promptly after each inspection that the fill has been constructed and maintained as designed and in accordance with the regulatory requirements. The report shall include appearances of instability, structural weakness, and other hazardous conditions. The certified report on the drainage system and protective filters shall include color photographs taken during and after construction, but before underdrains are covered with excess spoil. If the underdrain system is constructed in phases, each phase shall be certified separately. Where excess durable rock spoil is placed in single or multiple lifts such that the underdrain system is constructed simultaneously with excess spoil placement by the natural segregation of dumped materials, color photographs shall be taken of the underdrain as the underdrain system is being formed. The photographs accompanying each certified report shall be taken in adequate size and number with enough terrain or other physical features of the site shown to provide a relative scale to the photographs and to specifically and clearly identify the site. A copy of each inspection report shall be retained at or near the mine site.

Coal mines waste may be disposed of in excess spoil fills if approved by the Division and, if such waste is: placed in accordance with the requirements for refuse piles; nontoxic and nonacid forming; and, of the proper characteristics to be consistent with the design stability of the fill.

Spoil resulting from face-up operations for underground coal mine development may be placed at drift entries as part of a cut-and-fill structure, if the structure is less than 400 feet in horizontal length and designed in accordance with the general requirements for the disposal of excess spoil.

Excess Spoil: Valley fills/head-of-hollow fills

Valley fills and head-of-hollow fills shall meet the general requirements for excess spoil and the following additional requirements.

The top surface of the completed fill shall be graded such that the final slope after settlement will be toward properly designed drainage channels. Uncontrolled surface drainage may not be directed over the outslope of the fill. Runoff from areas above the fill and runoff from the surface of the fill shall be diverted into stabilized diversion channels and to safely pass the runoff from a 100-year, 6-hour precipitation event.

A rock-core chimney drain may be used in a head-of-hollow fill, instead of the underdrain and surface diversion system normally required, as long as the fill is not located in an area containing intermittent or perennial streams. A rock-core chimney drain may be used in a valley fill if the fill does not exceed 250,000 cubic yards of material and upstream drainage is diverted around the fill. The alternative rock-core chimney drain system shall be incorporated into the design and construction of the fill as follows:

(1) The fill shall have, along the vertical projection of the main buried stream channel or rill, a vertical core of the durable rock at least 16 feet thick which shall extend from the toe of the fill to the head of the fill and from the base of the fill to the surface of the fill. A system of lateral rock underdrains shall connect this rock core to each area of potential drainage or seepage in the disposal area. The underdrain system and rock core shall be designed to carry the anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area.

(2) A filter system to ensure the proper long-term functioning of the rock core shall be designed and constructed using current, prudent engineering practices.

(3) Grading may drain surface water away from the outslope of the fill and toward the rock core. In no case, however, may intermittent or perennial streams be diverted into the rock core. The maximum slope of the top of the fill shall be 33h:1v (3 percent). A drainage pocket may be maintained at the head of the fill during and after construction, to intercept surface runoff and discharge the runoff through or over the rock drain, if stability of the fill is not impaired. In no case shall this pocket or sump have a potential capacity for impounding more than 10,000 cubic feet of water. Terraces on the fill shall be graded with a 3- to 5-percent grade toward the fill and a 1-percent slope toward the rock core.

Excess Spoil: Durable rock fills

The Division may approve the alternative method of disposal of excess durable rock spoil by gravity placement in single or multiple lifts, provided the following conditions are met: durable rock fills shall meet the general requirements for excess spoil except as provided in this section; the excess spoil consists of at least 80 percent, by volume, durable, nonacid- and nontoxic-forming rock (e.g., sandstone or limestone) that does not slake in water and will not degrade to soil material. Where used, noncemented clay shale, clay spoil, soil, or other nondurable excess spoil material shall be mixed with excess durable rock spoil in a controlled manner such that no more than 20 percent of the fill volume, as determined by tests performed by a registered engineer and approved by the Division, is not durable rock; a qualified registered professional engineer certifies that the design will ensure the stability of the fill and meet all other applicable requirements; the fill is designed to attain a minimum long-term static safety factor of 1.5, and an earthquake safety factor of 1.1; the underdrain system may be constructed simultaneously with excess spoil placement by the natural segregation of dumped materials, provided the resulting underdrain system is capable of carrying anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area and the other requirements for drainage control are met; and, surface water runoff from areas adjacent to and above the fill is not allowed to flow onto the fill and is diverted into stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event.

Excess Spoil: Preexisting benches

The Division may approve the disposal of excess spoil through placement on preexisting benches, provided that the general requirements for excess spoil and the requirements of this section are met.

Excess spoil shall be placed only on the solid portion of the preexisting bench. The fill shall be designed, using current, prudent engineering practices, to attain a long-term static safety factor of 1.3 for all portions of the fill. The preexisting bench shall be backfilled and graded to achieve the most moderate slope possible which does not exceed the angle of repose, and eliminate the highwall to the maximum extent technically practical.

Disposal of excess spoil from an upper actively mined bench to a lower preexisting bench by means of gravity transport may be approved by the Division provided that: the gravity transport courses are determined on a site-specific basis by the operator as part of the permit application and approved by the Division to minimize hazards to health and safety and to ensure that damage will be minimized between the benches, outside the set course, and downslope of the lower bench should excess spoil accidentally move; all gravity-transported excess spoil, including that excess spoil immediately below the gravity transport courses and any preexisting spoil that is disturbed, is rehandled and placed in horizontal lifts in a controlled manner, concurrently compacted as necessary to ensure mass stability and to prevent mass movement, and graded to allow surface and subsurface drainage to be compatible with the natural surroundings and to ensure a minimum long-term static safety factor of 1.3. Excess spoil on the bench prior to the current mining operation that is not disturbed need not be rehandled except where necessary to ensure stability of the fill; a safety berm is constructed on the solid portion of the lower bench prior to gravity transport of the excess spoil. Where there is insufficient material on the lower bench to construct a safety berm, only that amount of excess spoil necessary for the construction of the berm may be gravity transported to the lower bench prior to construction of the berm; and, excess spoil shall not be allowed on the downslope below the upper bench except on designated gravity-transport courses properly prepared by removing topsoil. Upon completion of the fill, no excess spoil shall be allowed to remain on the designated gravity-transport course between the two benches and each transport course shall be reclaimed.

Analysis:

Coal Mine Waste

The Permittee has committed not to bring any coal mine waste to the surface. If the permittee finds that mining conditions are different than anticipated and that coal mine waste must be brought to the surface they will get Division approval before they bring the coal mine waste to the surface. The permittee is also authorized to ship coal mine waste to the Sunnyside Cogeneration facility.

Excess Spoil

The permittee states, on pages 3-10 and 3-11 that there will not be any excess spoil associated with this permit. However, on page 3-10, he states that sediment pond, ditch, and other clean out material will be placed in two areas as shown on the map or the company may elect to take the material to ECDC. The permittee also stated that they will take samples of the clean out material as dictated by the intended use and approved by the Division.

Findings:

The information provided meets the minimum regulatory requirements of this section.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Minimum Regulatory Requirements:

Each application shall contain maps, plans, and cross sections which show the mining activities to be conducted, the lands to be affected throughout the operation, and any change in a facility or feature to be caused by the proposed operations, if the facility or feature was shown and described as an existing structure.

The following shall be shown for the proposed permit area:

Affected area maps

The boundaries of all areas proposed to be affected over the estimated total life of all mining activities and reclamation activities, with a description of size, sequence, and timing of phased reclamation activities and treatments. All maps and cross sections used for mining design and mining operations shall clearly show the affected and permit area boundaries in reference to the reclamation work being accomplished.

Mining facilities maps

Location of each facility used in conjunction with mining operations. Such structures and facilities shall include, but not be limited to: buildings, utility corridors, roads, and facilities to be used in mining and reclamation operations or by others within the permit area; each coal storage, cleaning, and loading area; each topsoil, spoil, coal preparation waste, underground development waste, and noncoal waste storage area; each water diversion, collection, conveyance, treatment, storage and discharge facility; each source of waste and each waste disposal facility relating to coal processing or pollution control; each facility to be used to protect and enhance fish and wildlife related environmental values; each explosives storage and handling facility; location of each

sedimentation pond, permanent water impoundment, coal processing waste bank, and coal processing water dam and embankment, and disposal areas for underground development waste and excess spoil; and, each plan or profile, at cross sections specified by the Division, of the anticipated surface configuration to be achieved for the affected areas during mining operations.

Mine workings maps

Location and extent of known workings of proposed, active, inactive, or abandoned underground mines, including mine openings to the surface within the proposed permit and adjacent areas. Location and extent of existing or previously surface-mined areas within the proposed permit area.

Monitoring and sampling location maps

Elevations and locations of test borings and core samplings. Elevations and locations of monitoring stations used to gather data on water quality and quantity, subsidence, fish and wildlife, and air quality, as required during mining operations.

Certification Requirements

Cross sections, maps, and plans required to show the design, location, elevation, or horizontal or vertical extent of the land surface or of a structure or facility used to conduct mining and reclamation operations shall be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such cross sections, maps, and plans, a qualified, registered, professional land surveyor, with assistance from experts in related fields such as landscape architecture.

Each detailed design plan for an impounding structure that meets or exceeds the size or other criteria of the Mine Safety and Health Administration, 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified registered professional engineer with assistance from experts in related fields such as geology, land surveying, and landscape architecture; include any geotechnical investigation, design, and construction requirements for the structure; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Each detailed design plan for an impounding structure that does not meet the size or other criteria of 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, or in any State which authorizes land surveyors to prepare and certify such plans, a qualified, registered, professional land surveyor, except that all coal processing waste dams and embankments shall be certified by a qualified, registered, professional engineer; include any design and construction requirements for the structure, including any required geotechnical information; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Analysis:

Affected Area Maps

The boundaries of the disturbed area, as well as those of its component areas of previous and proposed disturbance, are shown adequately on Plates 3-1, 3-6, and 3-7.

Mining Facilities Maps

The locations and approximate dimensions of all mine facilities are shown on Plate 3-1--Surface Facilities. Included on this map are all buildings, portals, fans and earthen structures (pads, cuts and embankments), both of the large main drainage bypass culverts, the mine supply substation adjacent to the main portals, the large main substation at the mouth of the canyon, the Main Haul Road, the Hiawatha Fan Portal Access Road, the conveyor from the mine, the coal storage and loading facilities, the topsoil storage area, and the sediment pond. This plate was certified in 1996, after its latest revision, by Richard B. White, a professional engineer registered in the state of Utah. The permittee, on pages 3-4 and 3-5, corrected the deficiencies by

correcting the legends. Such corrections were made on the coal storage area on map, Plate 3-1. Also, such corrections were made on the snow storage area map, Plate 3-1.

Design details of the sediment pond are shown on Plate 7-6--Sedimentation Pond Detail Map. This plate was certified in 1996 by Richard B. White, a professional engineer registered in the state of Utah.

Mine Workings Maps

The location and extent of all known abandoned underground mine workings, including mine openings to the surface within the proposed permit and adjacent areas, are shown on Plate 3-3--Five Year Mine Plan. There are no active underground mines and there has been no surface mining within the permit and adjacent areas.

Monitoring and Sample Location Maps

Both geologic and groundwater information were obtained from test borings done at sites designated LMC-1, LMC-2, LMC-3, and LMC-4. The locations of these sites are shown on Plate 6-1--Geology and Plate 7-1--Water Monitoring Locations.

Information on water quality and quantity was obtained from monitoring stations designated 1, 2, 3, 4, 5, 6, and 7. The elevations and locations of these sites are shown on Plate 7-1--Water Monitoring Locations.

Findings:

The information provided meets the minimum regulatory requirements of this section.

RECLAMATION PLAN

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-270, -301-271, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Minimum Regulatory Requirements:

Note: The following requirements have been suspended insofar as they authorize any variance from approximate original contour for surface coal mining operations in any area which is not a steep slope area.

Criteria for permits incorporating variances from approximate original contour restoration requirements.

The Division may issue a permit for nonmountaintop removal mining which includes a variance from the backfilling and grading requirements to restore the disturbed areas to their approximate original contour. The permit may contain such a variance only if the Division finds, in writing, that the applicant has demonstrated, on the basis of a complete application, that the following requirements are met:

(1) After reclamation, the lands to be affected by the variance within the permit area will be suitable for an industrial, commercial, residential, or public postmining land use (including recreational facilities).
(2) The criteria for the proposed post mining land use will be met.
(3) The watershed of lands within the proposed permit and adjacent areas will be improved by the operations when compared with the condition of the watershed before mining or with its condition if the approximate original contour were to be restored. The watershed will be deemed improved only if: the amount of total suspended solids or other pollutants discharged to ground or surface water from the permit area will be reduced, so as to improve the public or private uses or the ecology of such water, or flood hazards within the watershed containing the permit area will be reduced by reduction of the peak flow discharge from precipitation events or thaws; the total volume of flow from the proposed permit area, during every season of the year, will not vary in a way that adversely affects the ecology of any surface water or any existing or planned use of surface or ground water; and, the appropriate State environmental agency approves the plan.
(4) The owner of the surface of the lands within the permit area has knowingly requested, in writing, as part of the application, that a variance be granted. The request shall be made separately from any surface owner consent given for right-of-entry and shall show an understanding that the variance could not be granted without the surface owner's request.

If a variance is granted, the requirements of the post mining land use criteria shall be included as a specific condition of the permit, and, the permit shall be specifically marked as containing a variance from approximate original contour.

A permit incorporating a variance shall be reviewed by the Division at least every 30 months following the issuance of the permit to evaluate the progress and development of the surface coal mining and reclamation operations to establish that the operator is proceeding in accordance with the terms of the variance. If the permittee demonstrates to the Division that the operations have been, and continue to be, conducted in compliance with the terms and conditions of the permit, the review specified need not be held. The terms and conditions of a permit incorporating a variance may be modified at any time by the Division, if it determines that more stringent measures are necessary to ensure that the operations involved are conducted in compliance with the requirements of the regulatory program. The Division may grant variances only if it has promulgated specific rules to govern the granting of variances in accordance with the provisions of this section and any necessary, more stringent requirements.

Analysis:

The minimum regulatory requirements for AOC are couched in terms of the backfilling and grading regulations. In addition to the backfilling and grading regulations the Division relies heavy on Technical Directive 004, Approximate Original Contour Requirements, to determine if

the reclamation plan adequately addresses AOC. The mining and reclamation plan must provide the basis for determining whether the proposed backfilling and grading plan will meet the following: (1) minimize off-site effects; (2) achieve a final surface configuration that closely resembles the general surface configuration to the land before mining; (3) provide a subsurface foundation for a vegetative cover capable of stabilizing the surface from erosion; and (4) support the post-mining land use. Each of these requirements is explained as follows:

- *Off-site effects requirements include the following:*

    - *Drainage Restoration:* The final surface configuration shall blend into and complement the drainage pattern of the surrounding terrain. Surface coal mining operations will be planned and conducted to minimize changes to the prevailing hydrologic balance in both the permit and the adjacent areas. The plan for final surface configuration of the affected area shall approximate the drainage pattern for the land prior to mining.

    - *Sediment Control:* The stability of planned post-mining slopes should rely on research-based formulas such as the Universal Soil Loss Equations (USLE) or other methods acceptable to the Division. The published values for the factors in the USLE are not site specific. Substitute values should be used when such values have been documented in the mining and reclamation plan and have been suitably justified.

- *The final surface configuration requirements include the following:*

    - *Final Topography*: The post-mining topography shall closely resemble the pre-mining topography of the mine site and surrounding area.

      Senate Report No. 28 on Senate Bill S.7 in 1974 shows a legislative intent not to require that the pre-mining topography be identical to post-mining topography by stating:

      It must be emphasized that the requirement to return to approximate original contour does not necessarily mandate the attainment of original elevation. (emphasis added, Senate Report No. 28, 94th Congress, 1st Session, ar 214 (1974).)

      Elevation should be considered as a factor in evaluation of compliance with this requirement only when a deviation between pre-mining and post-mining elevations would result in an adverse effect on one of the reclamation performance standards. The main criteria for compliance with this regulation will

be, "Does the post-mining topography, excluding elevation, closely resemble its pre-mining configuration?".

It is preferred to allow a higher post-mining elevation on reclaimed areas, rather than have the permittee create permanent out-of-pit storage areas, if slope length and gradient on the reclaimed slopes can be kept within acceptable limits. Similarly for underground mining operations, but on a different scale, mass balance calculations and accurate pre- and post-mining contour maps must be provided in order to determine spoil availability and the final location and disposition of these materials.

The final grade of post-mining slopes shall not exceed approximate pre-mining slope grades. The Division will take into consideration soil, climate, and other pertinent characteristics of the surrounding area in evaluating the adequacy of final graded slopes.

In arid or semi-arid areas, vegetation alone may not adequately control erosion on steep slopes. Therefore, the Division will closely evaluate the slope gradients of reclaimed areas to ensure effective erosion control.

- *Eliminate All Spoil Piles:* Elimination of all spoil piles means the regrading and reshaping of spoil materials, as defined in the regulations, in such a manner as to achieve AOC and the requirements of the post-mining land use. Refuse materials accumulated at the mine site during mining operations include mine development waste, coal mine waste, coal processing waste, sediment pond waste, and any other non-spoil material, and must be placed in accordance with approved designs.

- *Elimination of All Highwalls:* Although highwall retention under some circumstances may provide certain environmental benefits, both federal and state laws require complete elimination of all highwalls. In Utah, the rules indicate that permittees must eliminate all highwalls, except in previously or continuously mined areas and when cliffs existed in the highwall area before mining. Under the general requirements and within the meaning of this directive, elimination of highwalls means backfilling, regrading and reshaping highwalls in a manner that meets AOC requirements and the requirements of the post-mining land use.

  The term highwall was initially defined as a feature of surface coal mining operations. Under the regulations, the definition also applies to underground coal mining operations. For underground coal mining operations, <u>highwall means the area for entry to underground coal mining activities</u>. Portal face-up areas,

dugways, shafts, and boreholes for entry into underground coal mining activities are all considered highwalls.

The term highwall has also been broadly interpreted to include cut slopes or cut features associated with highwalls, roads, pad facilities and other surface features related to underground coal mining. The permanent program rules have eliminated this broad interpretation of the term. The rules fail, however, to address what specialized grading techniques, if any, should be used to reclaim cut-slopes or roads and pads.

- *Vegetative Erosion Control:*

  - The site must have a subsurface foundation for a vegetative cover capable of stabilizing the surface from erosion. The Division considers that the vegetation requirements for AOC have been met if the revegetation plan has been approved.

- *Post-mining Land Use:*

  - The general post-mining land use requirements that are associated with AOC are that the site be returned to the pre-mining land use or restored to an alternative post-mining land use. Details for those requirements are as follows:

  - *Pre-mining Land Use:* The pre-mining land uses are those uses which the land previously supported prior to any mining activities and which would have continued if the land had been properly managed. The post-mining land use is compared to the pre-mining use. For land that has been previously mined or continuously mined and not reclaimed, the pre-mining land use will be considered to be the land use that existed prior to the initial mining activity.

  - *Alternate Post-mining Land Use:* Higher or better uses may be approved as alternate post-mining land uses after consultation with the landowner or the land management agency having jurisdiction over the lands. The proposed uses must meet the following criteria: 1) there is a reasonable likelihood for achievement of the use; 2) the use does not present any actual or probable hazard to public health and safety, or threat of water diminution or pollution; 3) the use will not be impractical or unreasonable, inconsistent with applicable land use policies or plans, involve unreasonable delay in implementation, or cause or contribute to violation of Federal, State, or local law.

The Division evaluated the reclamation plan for the Horizon Mine for compliance with each of the four parts of the AOC requirements. Three of the parts of the AOC requirements (hydrology, vegetation, and post-mining land use) do not have specific regulations in those

sections of the R645 rules. Therefore, the Division considers those requirements to be met when the requirements for hydrology, vegetation, and post-mining land use have been met. Those requirements are be addressed in their specific sections of the TA.

The requirements that will be discussed in the AOC section of the TA involve surface configuration. The discussion of those requirements is as follows:

- *Final Topography*:

The Permittee states in Section 3.5.4, subsection Approximate Original Contour of the submittal, the following about restoring the site to the approximate original contours:

> *The area of the Horizon surface facilities was disturbed by previous mining activities. No pre-mining topographic maps of the area are known to exist. The reclamation plan has been designed to backfill and grade the site to achieve the assumed approximate original contour (i.e., to blend into the surrounding topography) and eliminate highwalls associated with the Horizon Mine.*

The Horizon Mine is in a steep narrow canyon. The permittee has limited options for reclaiming the site because of the surrounding steep slopes. Some reclaimed slopes will have 1.5 H to 1 V grades. However, none of the reclaimed slopes will exceed the slope angle of surface in the surrounding area.

Plate 3-7 shows the reclamation contours. The reclaimed slopes will feather into the existing slopes. The drainages have been established so that they are similar to those in adjacent canyons. The cross sections on Plate 3-7A shows the existing (operational) grades and the proposed reclamation grade. The cross sections show that the reclaimed area will be a "V" shaped valley that is similar to those of the surrounding area. The Division finds that the reclaimed surface will be similar to what most likely was the pre-mining surface.

- *Eliminate All Spoil Piles:*

No spoil piles are scheduled to be constructed on site. If the Permittee must develop spoil piles, then they will have to receive Division approval to modify the MRP.

- *Elimination of All Highwalls:*

During construction of the portals, three highwalls were created and then backfilled. A description of the highwalls is as follows:

  - The return air portal was developed at one of the old Blue Blaze No. 1 Mine portals. The mine opening was widened to accommodate modern

mining equipment. A 50-foot concrete portal cover was then constructed from the mouth of the old slope. Fill material was placed over the concrete cover which covered the highwall.

- The belt portal was excavated a length of 95 feet to solid overburden where the slope could be driven down to the seam. A 95 foot concrete portal cover was constructed for the belt portal. Fill material was placed over the concrete cover which covered the highwall.
- The intake portal was constructed for the intake slope. A 125 foot concrete portal cover was constructed for the intake portal. Fill material was placed over the concrete cover which covered the highwall.

The Permittee stated in section 3.5.4 Backfilling and Grading Plan subsection Elimination of Highwalls, Spoil Piles, and Depressions that no highwalls exist in the disturbed area. The Division accepts that statement with some clarification which is that highwalls were created during the construction of the portals. However, the highwalls were then backfilled and eliminated during construction. Figure 3-6, Horizon Portal Sealing, shows that backfill was placed against the highwalls and that the highwalls will remain covered after reclamation. The Division finds that the reclaimed site will conform with the final surface configuration requirements of the AOC directive.

Findings:

The Permittee has met the AOC minimum regulatory requirements.

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Minimum Regulatory Requirements:

General

Disturbed areas shall be backfilled and graded to: achieve the approximate original contour; eliminate all highwalls, spoil piles, and depressions; achieve a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long term static safety factor of 1.3 and to prevent slides; minimize erosion and water pollution both on and off the site; and, support the approved postmining land use.

The postmining slope may vary from the approximate original contour when approval is obtained from the Division for a variance from approximate original contour requirements, or when incomplete elimination of highwalls in previously mined areas is allowed under the regulatory requirements. Small depressions may be constructed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation.

If it is determined by the Division that disturbance of the existing spoil or underground development waste would increase environmental harm or adversely affect the health and safety of the public, the Division may allow the existing spoil or underground development waste pile to remain in place. Accordingly, regrading of settled and revegetated fills to achieve approximate original contour at the conclusion of underground mining activities shall not be required if: the settled and revegetated fills are composed of spoil or nonacid- or nontoxic-forming underground development waste; the spoil or underground development waste is not located

so as to be detrimental to the environment, to the health and safety of the public, or to the approved postmining land use; stability of the spoil or underground development waste must be demonstrated through standard geotechnical analysis to be consistent with backfilling and grading requirements for material on the solid bench (1.3 static safety factor) or excess spoil requirements for material not placed on a solid bench (1.5 static safety factor); and, the surface of the spoil or underground development waste shall be vegetated in accordance with the revegetation standards for success, and surface runoff shall be controlled in accordance with the regulatory requirements for diversions.

Spoil shall be returned to the mined-out surface area. Spoil and waste materials shall be compacted where advisable to ensure stability or to prevent leaching of toxic materials. Spoil may be placed on the area outside the mined-out surface area in nonsteep slope areas to restore the approximate original contour by blending the spoil into the surrounding terrain if the following requirements are met: all vegetative and organic materials shall be removed from the area; the topsoil on the area shall be removed, segregated, stored, and redistributed in accordance with regulatory requirements; the spoil shall be backfilled and graded on the area in accordance with the general requirements for backfilling and grading.

Disposal of coal processing waste and underground development waste in the mined-out surface area shall be in accordance with the requirements for the disposal of spoil and waste materials except that a long-term static safety factor of 1.3 shall be achieved.

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

Cut-and-fill terraces may be allowed by the Division where: needed to conserve soil moisture, ensure stability, and control erosion on final-graded slopes, if the terraces are compatible with the approved postmining land use; or, specialized grading, foundation conditions, or roads are required for the approved postmining land use, in which case the final grading may include a terrace of adequate width to ensure the safety, stability, and erosion control necessary to implement the postmining land-use plan.

Preparation of final-graded surfaces shall be conducted in a manner that minimizes erosion and provides a surface for replacement of topsoil that will minimize slippage.

Previously mined areas

Remining operations on previously mined areas that contain a preexisting highwall shall comply with all other reclamation requirements except as provided herein. The requirement that elimination of highwalls shall not apply to remining operations where the volume of all reasonably available spoil is demonstrated in writing to the Division to be insufficient to completely backfill the reaffected or enlarged highwall. The highwall shall be eliminated to the maximum extent technically practical in accordance with the following criteria:

(1) All spoil generated by the remining operation and any other reasonably available spoil shall be used to backfill the area. Reasonably available spoil in the immediate vicinity of the remining operation shall be included within the permit area.

(2) The backfill shall be graded to a slope which is compatible with the approved postmining land use and which provides adequate drainage and long-term stability.

(3) Any highwall remnant shall be stable and not pose a hazard to the public health and safety or to the environment. The operator shall demonstrate, to the satisfaction of the Division, that the highwall remnant is stable.

(4) Spoil placed on the outslope during previous mining operations shall not be disturbed if such disturbances will cause instability of the remaining spoil or otherwise increase the hazard to the public health and safety or to the environment.

Backfilling and grading on steep slopes

Underground mining activities on steep slopes shall be conducted so as to meet other applicable regulatory requirements and the requirements of this section. The following materials shall not be placed on the downslope: spoil; waste materials of any type; debris, including that from clearing and grubbing; abandoned or disabled equipment; land above the highwall shall not be disturbed unless the Division finds that this disturbance will facilitate compliance with the environmental protection standards and the disturbance is limited to that necessary to facilitate compliance; and, woody materials shall not be buried in the backfilled area unless the Division determines that the proposed method for placing woody material within the backfill will not deteriorate the stable condition of the backfilled area.

Special provisions for steep slope mining

No permit shall be issued for any operations covered by steep slope mining, unless the Division finds, in writing, that in addition to meeting all other regulatory requirements, the operation will be conducted in accordance with the requirements for backfilling and grading on steep slopes. Any application for a permit for surface coal mining and reclamation operations covered by steep slope mining shall contain sufficient information to establish that the operations will be conducted in accordance with the requirements for backfilling and grading on steep slopes.

This section applies to any person who conducts or intends to conduct steep slope surface coal mining and reclamation operations, except: where an operator proposes to conduct surface coal mining and reclamation operations on flat or gently rolling terrain, leaving a plain or predominantly flat area, but on which an occasional steep slope is encountered as the mining operation proceeds; where a person obtains a permit under the provisions for mountaintop removal mining; or, to the extent that a person obtains a permit incorporating a variance from approximate original contour restoration requirements.

Analysis:

A slope stability study was done for the proposed reclaimed slopes at the Horizon Mine. The Permittee used SBSlope, a slope stability program, to calculate the safety factors for the slopes. The results of the slope stability study indicate safety factors for slope J-J' and slope S-S' are 1.9 and 1.5 respectively. Those slopes were chosen because they are the longest or steepest reclaimed slopes. The minimum safety factor for reclaimed slopes is 1.3. Therefore, the Permittee has met that requirement.

The Permittee states that no coal seams are currently exposed in the disturbed area. However, if any coal seams were exposed during backfilling and regrading then the coal seams would be covered with 4 feet of nontoxic and noncombustible materials. In subsection Elimination of Highwalls, Spoil Piles, and Depressions, the permittee states that access to the coal seam are by means of shallow angle slopes that drop 6 feet to 12 feet before intercepting the coal seams.

Section 3.3.2.5 of the existing MRP discusses the coal mine waste (from previous mining operations) buried within the operations pad (see Plate 3-7 for approximate locations). The existing MRP indicates that approximately 2500 - 2700 CY of waste are buried 4 feet deep within the pad. This information is restated in the submittal, page 3-44, under "Acid and Toxic Forming Materials." The plate in Appendix 3-8 is entitled Sweets Canyon, Pond Utilities. It did not have the information mentioned on coal mine waste burial locations.

As discussed above in this Technical Analysis under Environmental Soil Resource Information, previous sampling of this waste revealed some elevated boron levels. Refuse/coal waste material in pit #8 (location shown on Plate 8-1) revealed levels of Boron at 4.8 mg/kg (0 - 12 inches) and 5.19 mg/kg (10 - 11 feet deep). Boron is toxic to plants. Boron which exceeds 5 mg/kg is considered unsuitable growth medium and must be covered with a minimum of four feet of suitable growth medium. Additionally, the 1996 profile descriptions of the embankment southwest of the portals portray layered coal debris, coal waste, rock fragments and disturbed soils from previous mining operations. One pit sample showed an Acid/Base Potential (ABP) of -1.16 tons $CaCO_3$/1000 tons material. Therefore, the waste material buried on site is suspected as toxic for both boron content and acid generation.

Approximate burial locations of coal mine waste are indicated on Plate 3-7, Reclamation Topography. The map suggests that coal mine waste may be buried very close to the proposed reclaimed channel of Portal Canyon. Of particular concern is the buried waste shown at cross-section F-F' on Plate 3-7, where measurements of the reclamation channel indicate that the channel will come in contact with the buried coal mine waste. The Permittee must ensure that runoff from the design storm will not come in contact with the coal mine waste, which means that the buried waste must be removed to accommodate the channel width (including topsoil coverage) and flood plain protection (see Figure 7-12 Typical Cross Sections For Reclaimed Channels).

R645-301-746.120 requires that all coal mine waste is placed in a manner to minimize adverse effects of leachate and surface water runoff. The Permittee has complied with this requirement by the commitment given in section 3.5.3.2 (page 3-44) where it is mentioned that any toxic coal waste buried in the mine pad fill that is uncovered by reclamation grading work will be placed in the fill areas outside of drainages and covered with four feet of non-toxic fill. Locations will be mapped at the time of placement and submitted to the Division.

The Permittee does not propose to leave any cut and fill terraces. Nor do they propose to leave any settled and revegetated fills.

The highwall issues are covered in the AOC section of this TA.

Findings:

The Permittee has met the backfilling and grading minimum regulatory requirements.

TOPSOIL AND SUBSOIL

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

Minimum Regulatory Requirements:

Redistribution

Topsoil materials shall be redistributed in a manner that: achieves an approximately uniform, stable thickness consistent with the approved postmining land use, contours, and surface-water drainage systems; prevents excess compaction of the materials: and, protects the materials from wind and water erosion before and after seeding and planting.

Before redistribution of the material, the regarded land shall be treated if necessary to reduce potential slippage of the redistribution material and to promote root penetration. If no harm will be caused to the redistributed material and reestablished vegetation, such treatment may be conducted after such material is replaced.

The Division may choose not to require the redistribution of topsoil or topsoil substitutes on the approved postmining embankments of permanent impoundments or of roads if it determines that placement of topsoil or topsoil substitutes on such embankments is inconsistent with the requirement to use the best technology currently available to prevent sedimentation, and, such embankments will be otherwise stabilized.

Nutrients and soil amendments shall be applied to the initially redistributed material when necessary to establish the vegetative cover.

The Division may require that the B horizon, C horizon, or other underlying strata, or portions thereof, removed and segregated, stockpiled, be redistributed as subsoil in accordance with the requirements of the above if it finds that such subsoil layers are necessary to comply with the revegetation requirements.

Analysis:

Redistribution

The disturbed area is 9.15 acres. Table 3-1 shows the cut and fill estimates for the disturbed area. An average cut of 1.71 feet over 4.271 acres will yield 11,753 CY. An average fill depth of 1.46 feet over 4.34 acres will require 10,239 CY. The MRP indicates in section 8.8, that topsoil will be spread 10 inches deep over 4.04 acres. (Previously, the figure was 5.49 acres, the difference is due to the plan to leave undisturbed areas identified as Contemporaneous Reclamation on Plate B.) Plate B, Appendix 8-1 illustrates the 4.04 acres of ground to receive the application of topsoil during reclamation.

The lower slopes in Areas B, D, and E (shown on Plate 3-7) will have topsoil removed from them during final reclamation. A qualified person will be on site to ensure that the topsoil stored on these slopes is removed and placed on the topsoil stockpile for reclamation use. Section 8-8 further identifies methods to be used when salvaging topsoil.

Findings:

The information provided meets the minimum reclamation topsoil and subsoil information requirements of the Regulations.

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.

Minimum Regulatory Requirements:

Revegetation: General requirements

The permittee shall establish on regraded areas and on all other disturbed areas except water areas and surface areas of roads that are approved as part of the postmining land use, a vegetative cover that is in accordance with the approved permit and reclamation plan and that is: diverse, effective, and permanent; comprised of species native to the area, or of introduced species where desirable and necessary to achieve the approved postmining land use and approved by the Division; at least equal in extent of cover to the natural vegetation of the area; and, capable of stabilizing the soil surface from erosion.

The reestablished plant species shall: be compatible with the approved postmining land use; have the same seasonal characteristics of growth as the original vegetation; be capable of self-regeneration and plant succession; be compatible with the plant and animal species of the area; and, meet the requirements of applicable State and Federal seed, poisonous and noxious plant, and introduced species laws or regulations.

The Division may grant exception to these requirements when the species are necessary to achieve a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved permit and reclamation plan.

When the Division approves a cropland postmining land use, the Division may grant exceptions to the requirements related to the original and native species of the area. Areas identified as prime farmlands must also meet those specific requirements as specified under that section.

Analysis:

General Requirements

No reclamation or permanent revegetation has been conducted on site. Plate 3-7, Reclamation Topography, show areas of interim and contemporaneous reclamation. The legend labels the interim reclamation as areas which may be re-disturbed during final reclamation. This legend label leads one to believe that the areas shown as interim reclamation could not be redisturbed during final reclamation. It is this reviewer's understanding that no final reclamation was approved or occurred on site. All areas shown as interim and contemporaneous reclamation are potential topsoil storage areas or waste burial areas and may be redisturbed. The plate is not correct and must be changed or provide detailed information for the reclamation of these areas showing that all the requirements and performance standards of the regulations have been met.

The plan on page 3-51 refers to cicer milkvetch in the seed mixture. This species is no longer in the mix and reference to it should be removed.

Findings:

Information found in the proposed changes to the plan relevant to this midterm review do not meet the minimum regulatory requirements of this section. The permittee must provide the following in accordance with:

R645-301-353.100, Plate 3-7 is not correct and must be changed. No final reclamation has occurred on site. Either the map must be changed or the Operator may provide detailed information on the reclamation of these areas showing all the requirements and performance standards of the regulations have been met for final reclamation.

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

Minimum Regulatory Requirements:

All exposed surface areas shall be protected and stabilized to effectively control erosion and air pollution attendant to erosion. Rills and gullies which form in areas that have been regraded and topsoiled and which either disrupt the approved

postmining land use or the reestablishment of the vegetative cover, or, cause or contribute to a violation of water quality standards for receiving streams, shall be filled, regraded, or otherwise stabilized; topsoil shall be replaced; and the areas shall be reseeded or replanted.

Analysis:

Section 3.5.4, Backfilling and Grading Plans, indicates that reclaimed slopes will not exceed the angle of repose which for a slightly cohesive granular soil would be 35 degrees which corresponds to a slope 1.5h:1v or 70% slope.

As spelled out in Section 3.5.4 and Section 3.5.1, erosion and water pollution will be controlled by small depressions to retain moisture (refer to Plate 3-7 and Figure 3-6) and through silt fences at the bottom of fill slopes and along the top bank of the reclamation channel. Section 3.5.5.3 indicates that 2,000 pounds per acre mulch will be applied to the graded surface and incorporated into the surface with roughening before seeding. Erosion control matting will be used on all slopes that are 2.5h:1v or steeper.

Section 3.5.5.4 indicates that reclaimed and revegetated areas will be closely monitored, as described in Sections 3.5 and 9.8, for severe erosion, excessive weeds, bare patches and damage by wildlife. Section 3.5 did not indicate that the Permittee would stabilize and re-topsoil rills and gullies which form in the reclaimed landscape and which are disruptive to the post-mining land use or which contribute to a violation of water quality standards.

Findings:

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

R645-301-244.320, The plan must include a commitment as follows: rills and gullies which form in areas that have been regraded and topsoiled and which either disrupt the approved post-mining land use or the reestablishment of the vegetative cover, or, cause or contribute to a violation of water quality standards for receiving streams, shall be filled, regraded, or otherwise stabilized; topsoil shall be replaced; and the areas shall be reseeded or replanted.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Minimum Regulatory Requirements:

Each application shall contain maps, plans, and cross sections which show the reclamation activities to be conducted, the lands to be affected throughout the operation, and any change in a facility or feature to be caused by the proposed operations, if the facility or feature was shown and described as an existing structure.

The permit application must include as part of the reclamation plan information, the following maps, plans and cross sections:

Affected area boundary maps

The boundaries of all areas proposed to be affected over the estimated total life of all mining activities and reclamation activities, with a description of size, sequence, and timing of phased reclamation activities and treatments. All maps and cross sections used for reclamation design purposes shall clearly show the affected and permit area boundaries in reference to the reclamation work being accomplished.

Reclamation facilities maps

Location of each facility that will remain on the proposed permit area as a permanent feature, after the completion of underground mining activities. Location and final disposition of each sedimentation pond, permanent water impoundment, coal processing waste bank, and coal processing water dam and embankment, disposal areas for underground development waste and excess spoil, and water treatment and air pollution control facilities within the proposed permit area to be used in conjunction with phased reclamation activities or to remain as part of reclamation.

Reclamation monitoring and sampling location maps

Elevations and locations of test borings and core samplings. Elevations and locations of monitoring stations used to gather data on water quality and quantity, subsidence, fish and wildlife, and air quality, if required, to demonstrate reclamation success.

Reclamation surface and subsurface manmade features maps

The location of all buildings in and within 1,000 feet of the proposed permit area, with identification of the current or proposed use of the buildings at the time of final reclamation. The location of surface and subsurface manmade features within, passing through, or passing over the proposed permit area, including, but not limited to, major electric transmission lines, pipelines, fences, and agricultural drainage tile fields. Each public road located in or within 100 feet of the proposed permit area and all roads within the permit area which are to be left as part of the post-mining land use. Buildings, utility corridors, and facilities to be used in conjunction with reclamation or to remain for final reclamation.

Certification Requirements.

Cross sections, maps, and plans required to show the design, location, elevation, or horizontal or vertical extent of the land surface or of a structure or facility used to conduct mining and reclamation operations shall be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such cross sections, maps, and plans, a qualified, registered, professional land surveyor, with assistance from experts in related fields such as landscape architecture.

Each detailed design plan for an impounding structure that meets or exceeds the size or other criteria of the Mine Safety and Health Administration, 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified registered professional engineer with assistance from experts in related fields such as geology, land surveying, and landscape architecture; include any geotechnical investigation, design, and construction requirements for the structure; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Each detailed design plan for an impounding structure that does not meet the size or other criteria of 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, or in any State which authorizes land surveyors to prepare and certify such plans, a qualified, registered, professional land surveyor, except that all coal processing waste dams and embankments shall be certified by a qualified, registered, professional engineer; include any design and construction requirements for the structure, including any required geotechnical information; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Analysis:

Affected area maps

The boundaries of the disturbed area, as well as those of its component areas of previous and proposed disturbance, are shown adequately on Plates 3-1, 3-6, and 3-7.

Reclamation facilities maps

The locations and approximate dimensions of all mine facilities are shown on Plate 3-1--Surface Facilities. Included on this map are all buildings, portals, fans, and earthen structures (pads, cuts, and embankments), both of the large main drainage bypass culverts, the mine supply substation adjacent to the main portals, the large main substation at the mouth of the canyon, the Main Haul Road, the Hiawatha Fan Portal Access Road, the conveyor from the mine, the coal storage and loading facilities, the topsoil storage area, and the sediment pond. This plate was certified in 1996, after its latest revision, by Richard B. White, a professional engineer registered in the state of Utah.

Design details of the sediment pond are shown on Plate 7-6--Sedimentation Pond Detail Map. This plate was certified in 1996 by Richard B. White, a professional engineer registered in the state of Utah.

Cross-sections of main channel culverts indicating culvert size and trash rack are shown in Figure 7-8.

Reclamation monitoring and sample location maps

Both geologic and groundwater information were obtained from test borings done at sites designated LMC-1, LMC-2, LMC-3, and LMC-4. The locations of these sites are shown on Plate 6-1--Geology and Plate 7-1--Water Monitoring Locations.

Information on water quality and quantity was obtained from monitoring stations designated 1, 2, 3, 4, 5, 6, and 7. The elevations and locations of these sites are shown on Plate 7-1--Water Monitoring Locations.

Reclamation surface and subsurface manmade features maps

The location and extent of all known abandoned underground mine workings, including mine openings to the surface within the proposed permit and adjacent areas, are shown on Plate 3-3--Five Year Mine Plan. There are no active underground mines and there has been no surface mining within the permit and adjacent areas.

Findings:

The information provided meets the minimum regulatory requirements of this section.

RULES INDEX

30 CFR

701.5 17
777.11 5
783 7
783.21 7
784.15 25
784.19 17
784.21 ..... 7, 11
784.23 ..... 21, 36
784.25 17
785.15 30
785.16 25
785.18 34
817.102 ..... 25, 30
817.107 ..... 25, 30
817.111 34
817.113 34
817.114 34
817.116 34
817.133 25
817.200 7
817.22 ..... 12, 33
817.71 17
817.72 17
817.73 17
817.74 17
817.81 17
817.83 17
817.84 17
817.87 17
817.89 17
817.95 35
817.97 11

R645

-100-200 17
-301-120 5
-301-210 17
-301-211 17
-301-212 17
-301-220 7
-301-230 12
-301-234 ..... 25, 30
-301-240 33
-301-244 ..... 34, 35
-301-270 25
-301-271 25
-301-322 ..... 7, 11
-301-323 36

-301-333 11
-301-342 11
-301-353 34
-301-354 34
-301-355 34
-301-356 34
-301-358 11
-301-411 7
-301-412 ..... 17, 25
-301-413 25
-301-512 ..... 17, 21, 25, 36
-301-513 17
-301-514 17
-301-521 ..... 17, 21, 36
-301-526 17
-301-528 17
-301-531 25
-301-533 25
-301-535 17
-301-536 ..... 17, 25
-301-537 30
-301-542 ..... 17, 21, 25, 36
-301-552 30
-301-553 ..... 17, 25, 30
-301-632 ..... 21, 36
-301-731 ..... 21, 25, 36
-301-732 25
-301-733 25
-301-745 17
-301-746 17
-301-747 17
-301-764 25
-302-230 30
-302-231 30
-302-232 30
-302-233 30
-302-280 34
-302-281 34
-302-282 34
-302-283 34
-302-284 34
-302-323 21