



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

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Michael O. Leavitt
Governor
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Division Director

September 16, 1998

Johnny Pappas, Senior Environmental Engineer
Cyprus Plateau Mining Corp.
Willow Creek Mine
847 Northwest Highway 191
Helper, Utah 84526

Re: Barn Canyon Ventilation Facility, Cyprus Plateau Mining Company, Willow Creek Mine,
ACT/007/038-98B, File #2, Carbon County, Utah

Dear Mr. Pappas:

The technical analysis for the referenced amendment has been completed by our staff. Please respond to these deficiencies by September 30, 1998.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

SOILS RESOURCE INFORMATION

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

Analysis:

The Barn Canyon Ventilation Facility amendment contains adequate information regarding the soils environmental resources as follows:

- Order-I Soil Survey and Map
- Soils Identification, Description and Characterization

Order-I Soil Survey and Map

An Order-I soil survey supplies information for the ventilation facility area. Mr. Jim Nyenhuis, ARCPACS Certified Professional Soil Scientist, conducted the survey for Mt. Nebo Scientific on January 14, 1998. Mr. Robert Davidson, Soils Senior Reclamation Specialist, Utah Division Oil, Gas and Mining (DOGM), was also present on the site during fieldwork. Four soil pits were dug, described, and sampled for the survey. Two native, undisturbed soils (BC3 and BC4), and two disturbed sites (BC1 and BC2) were sampled. For site BC2, the surface had been disturbed with the underlying soil substratum (C horizon) still

present. Standard soil descriptions were completed in the field and a total of eleven soil samples were collected from the four pits.

The amendment contains an Order-I soils map delineating each soil, sampling locations and soil descriptions for each map unit (Figure 3.1-1). The map scale 1:360 is within the required 1:15,840 or larger scale for Order-I surveys. Likewise, the 0.46 acre surveyed site is within the minimum delineation size (2.5 acres) for an Order-I soil survey.

Soils Identification, Description and Characterization

For the Order-I soil survey, the four soil areas described are listed as follows with their respective soil series and taxonomic class:

MAP UNIT	PIT LOCATION	SOIL SERIES	TAXONOMIC CLASS ¹
A	BC-4	Perma Sandy Loam 10-25% slopes	loamy-skeletal, mixed, Typic Haploboroll
B	BC-3	Pathead Cobbly Loam 35-65% slopes	loamy-skeletal, mixed (calcareous), frigid Typic Ustorthent
C	BC-2	Disturbed Hillside Pathead (C horizon) 4-12% slopes	loamy-skeletal, mixed (calcareous), frigid Typic Ustorthent
D	BC-1	Disturbed Drainage 3-8% slopes.	None

The Order-I soil survey provides (1) a description of each map unit in areas A, B, C, and D; (2) a profile description of each of the soils at the four sample sites, BC1 through 4; and (3) a copy of the soil laboratory data for the eleven soil samples taken from the four sample sites.

Samples were sent to Inter-Mountain Laboratory (IML, Farmington, NM) for analysis according to the Division's Guidelines for Management of Topsoil and Overburden² and by consultation with Mr. Robert Davidson, DOGM. Parameters analyzed include pH, EC, saturation percent, Ca, Mg, Na, SAR, texture, CaCO₃, soluble B, soluble Se, TOC, and organic matter.

With the exception of rock fragments, soils have physical and chemical properties that are within DOGM's acceptable range for soil and overburden guidelines. The Division recognizes that native soils contain high percentages of rock fragments, is inevitable and does not present a reclamation hazard. Certainly, to reclaim and restore the land to pre-mining conditions will require soils with indigenous rock fragment volumes and content. Therefore, it is not only acceptable, but desirable to salvage soils containing intrinsic rock, gravels, cobbles and boulders.

¹ Jensen, E.H., and Borchert, J.W., 1988. Soil Survey of Carbon Area, Utah Soil Conservation Service, United States Department of Agriculture, Washington D.C.

² Leatherwood, James, and Dan Duce. 1988. Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining. State of Utah, Department of Natural Resources, Division of Oil, Gas and Mining. Salt Lake City, Utah.

Findings:

The information provided is adequate for the requirements of this section.

OPERATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

The Order-I soil survey for Barn Canyon Air Ventilation/Fan Shaft site includes discussion of topsoil suitability and potential soil salvage depths for each of the four soil map units as follows:

- Topsoil Salvage
- Soil Storage in Gravel Canyon
- Topsoil Salvage Summary

Topsoil Salvage

Soil salvage recommendations are based on the Order-I soil survey which identifies topsoil suitability and volumes calculated for each of the four soil map units. Soil will be salvaged prior to construction and will include long-term and temporary soil storage. The Permit Area encompasses 0.72 acres. Within the Permit area is the Potential Disturbed Area that is 0.46 acres. This area is incorrectly identified on Table 4.5-1 as 0.36 acres.

Map Unit A, Perma sandy loam, is mapped in an undisturbed area under predominantly Gambel's oak vegetation. An average 2 feet of suitable soil is available for salvage and will include a 0.107 acres. Pockets of soil salvage may reach depths of 35 inches, but are not included within the projected soil salvage volumes. This soil is classified as a Mollisol which have deep rich A horizons. Therefore, this soil needs to be salvaged and segregated from other soils salvaged from the site.

Map Unit B, Pathead cobbly loam, is mapped in an undisturbed area under mixed vegetation including scattered Juniper. An average of 18 inches of suitable soil is available for salvage. In the affected area, it occupies 0.216.

Map Unit C, disturbed hillside, is located in an old disturbed side-hill cut where a pad site was created (0.046 acres). Present vegetation consists of mixed grasses and some sagebrush. Six inches of this soil will be salvaged and stored.

Map Unit D, disturbed drainage, is located adjacent to the main dirt road in Barn Canyon and includes the Barn Canyon drainage channel bottom areas (0.091acre). No soil salvage will occur from this unit because the exposed surface soils are compacted and the underlying soil substratum contain greater

than 65% total gravels, cobbles and stones.

Long-Term Soil Storage

The amendment states that long-term storage of 906.4 CY will be in the existing Gravel Canyon stockpile. The Map Unit A Mollisol (345 CY) needs to be salvaged, segregated and stored separately from the other salvaged soils for the purpose of returning this topsoil as the final top dressing during reclamation.

Topsoil Salvage Summary

Potential topsoil salvage depths and volumes are summarized for each of the four soil map units in the following table:

MAP UNIT	AVERAGE SOIL SALVAGE DEPTH (INCHES)	LONG-TERM STORAGE (CUBIC YARDS)
A	24	345.8
B	18	523.4
C	6	37.2
D	0	-
Total	-	906.4

Findings:

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

R645-301-232 and R645-301-234, The Map Unit A Mollisol (345 CY) needs to be salvaged, segregated and stored separately from the other salvaged soils for the purpose of returning this topsoil as the final top dressing during reclamation.

An error in typing the disturbed acreage was noted in Table 4.5-1. The Barn Canyon Shaft Facility disturbed area should read 0.46 acres.

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

A summary of topsoil volumes available for reclamation is given. Topsoil will be used during final reclamation at mine closure. No further information is provided for reclamation commitments of the ventilation disturbance area other than those generally contained in existing Mine Reclamation Plan.

Findings:

The information provided meets the regulatory requirements of this section.

TECHNICAL ANALYSIS:

Coal Mine Waste.

Regulatory Reference: R645-301-536.600. Underground Development Waste

Utility Installations/Support Facilities.

Regulatory Reference: R645-301-526.220

R645-301-521.180 Submittal of Design Drawings, Cross Sections and Specifications for Support Facility to be Constructed

Analysis:

On May 1, 1998, the Division met with Mr. Ben Grimes of Hansen, Allen and Luce and Mr. Johnny Pappas of Cyprus Plateau Mining Company to discuss the initial deficiencies which were forwarded to them on April 2, 1998. Page 11, paragraph one of the Division's deficiencies response says "No description is made of the shafts dimensions, depth, geologic stratigraphy, or method of construction, etc., is made". Mr. Pappas and Mr. Grimes were verbally informed that the permittee should establish who the shaft sinking contractor would be, and have that firm submit their standard design for a concreted lined vertical air shaft. Depth and diameter considerations could have been verbally indicated in text. The shaft contractor should also be able to submit a blasting round design for the excavation process.

The only information which I can find in this response which is relative to design specifications is that shown on the drawing "Post Mining Topography, Map 32." Longitudinal cross section 6 of same shows the expandable concrete plug covered by four feet of incombustible material and the MSHA required vent pipe. The plug sits in a shaft with an inside diameter of 16 feet. This contradicts the verbal information supplied by Mr. Pappas prior to the initial submittal. I was informed that the shaft's finished size was 15 feet; the construction hole was to be 17 feet in diameter.

The permittee has responded to the issue of where the mine development waste generated during

the construction of the air shaft will be placed. All waste will be placed on the School House Canyon refuse pile which is a permitted site meeting all requirements of the R645 regulations.

It appears that the information which has been provided relative to the design specifications for the air shaft is lacking or inconsistent. The second submittal does not include a basic design for a concrete lined vertical air shaft as was requested during the May 1, 1998 meeting. Although R645-301-526.220 was not specifically mentioned, there are no design drawings or specifications relative to the shaft design, concrete requirements, etc. This second submittal remains inadequate.

Findings:

The submittal does not meet the requirements of R645-301-526.220, relative to the required design drawings or specifications for the concrete lined vertical air shaft, which is a support facility.

The submittal meets the requirements R645-301-121.200, in that all mine development waste will be permanently disposed of on the School House Canyon refuse pile.

USE OF EXPLOSIVES

Regulatory Reference: R645-301-524. Blasting and Explosives.

In this submittal, the permittee commits on page 4.5-28, paragraph one to address the initial round as a surface blast as mandated by R645-301-524. This regulation requires that R645-301-524.100 through 524.700 be applied through the initial rounds of shaft sinking.

- 1) R645-301-524.100, 110, 120, 130, 140, Page 4.5-28 and 29 of the Willow Creek MRP commits to meeting these requirements.
- 2) R645-301-524.200. "Unless approved by the Division under R645-301-524.220, the blast design must be described in the permit application."

Page 4.5-29 (in paragraph at top of page) of the Willow Creek mining and reclamation plan, Cyprus commits that "if a blast will require more than five pounds of explosive, CPMC will submit specific blast design information to UDOGM prior to the blast." 524.220 says the "The blast design may be presented as part of a permit application, or at a time, before the blast, if approved by the Division.

- 3) R645-301-524.210 indicates that "An anticipated blast design will be submitted for all blasts if blasting operations will be conducted within 9a) 1,000 feet of any building; this reg is not applicable, and (b) 500 feet of an active underground mine; this reg may be applicable, but the timing of the development for the underground entries has not been discussed. Map 19-A, Mine Plan "D" Seam, shows that the mine will be developed around the bottom of the Barn Canyon Shaft in December 1998, but this still leaves questions, as far as timing. Will the shaft penetrate the "D" seam and then be cut into? or will the shaft break through into an already developed area? MSHA will require that ventilation controls be in place prior to the interception of the coal seam by the shaft.
- 4) R645-301-524.230. "The blast design will contain sketches of the drill patterns, delay periods, and decking and will indicate the type and amount of explosives to be used,

critical dimensions, and the location and general description of structures to be protected, (the only structures needing protection on initial blasts will probably be the construction derrick and an engineering trailer), as well as a discussion of design factors to be used, (i.e., burden, powder factor). A review of Map 12, Regional geology map, and Map 14-A, Overburden Isopach D Seam with a correlation with Map 13A, Geologic Cross Section A-A' indicates (based on borehole data obtained from hole MC 016) that the first 85 feet of construction hole will encounter the Castlegate sandstone; the remaining 650 feet of hole to the top of the "D" seam will be developed in the Blackhawk formation. The Blackhawk formation above the "thick marginal marine sandstones generally consists of thick (10-50 foot) sequences of lenticular channel deposits interspersed with more moderate (5-15 foot) sequences of sheet sandstone deposits.

Composition consists of medium- to fine-grained with a high percentage of silica or calcite cementation; this generally has low permeability, (i.e., a very dense rock). About 35 percent of the upper Blackhawk is composed of correlatable

sandstones, (page 3.6-9, Willow Creek MRP). Based on the above geologic information, it seems that the initial blast design for penetrating the Castlegate sandstone should be very close if not the same as the design necessary to penetrate the 660 feet of upper Blackhawk (which consists of 35 percent tightly compacted lenticular sandstone deposits).

The submittal does not adequately address the requirements of R645-301-524.100 through 524.700 based on the information provided.

Based on the fact that MSHA regulations and approval for the blast design is necessary after the initial round is mucked, DOGM approval for these requirements will be achieved upon MSHA approval of the blast designs.

The blast designs for the shaft construction must first be approved by MSHA in order to meet the requirements of the R645 regulations.

Findings:

The submittal has failed to address the requirements of R645-301-524.200-230. If the MSHA approved blasting design for the shaft construction adequately addresses the R645 requirements, that portion of this submittal will be recommended for approval.

The permittee must first seek and obtain MSHA approval for a certified blast design for the shaft construction.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: R645-301-512, 521, 542, 632, 731, 323.

Analysis:

Affected Area Maps:

In the first deficiency response, Map 31, although P. E. certified, had several issues which needed clarified or changed.

Page 12 of the Division's first response to the permittee indicates that no substation or power line is shown to operate the fan at the air shaft. It has since been determined by the permittee that no fan will be installed; the air shaft will intake air only. The escape hoist will be diesel powered; a portable fuel tank will be hauled to the site for the weekly hoist checks, and during emergency evacuations.

RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: 30 CFR Sec.784.18; R645-301-521, -301-526

Analysis:

The permittee stated in the original submittal that the Barn Canyon road is used as access by Utah Power and Light crews to the 138 KV line. However, access to Barn Canyon proper must be made across privately owned ground (ownership is Cyprus). The public generally does not use this road, as Cyprus would not want public access across MSHA regulated private ground. Also, when American Electric Power (i.e., Price River Coal Company) operated the wash plant, access was restricted for many years by the locked gate located at the scale house. Since Cyprus is upgrading the road to meet R645 requirements, and Map 33, Barn Canyon Shaft Facility Access Road shows the road and the air shaft pad within the disturbed area boundary, the road is considered private.

An increase in disturbance of 0.36 acres has been added in the MRP with the addition of the Barn Canyon access road and air shaft pad.

Although it has been rumored that the 138 KV line is to be relocated, access to upper Barn Canyon will continue to be allowed to UP &L crews.

Since the Barn Canyon road is private, the concerns of 526.116 need to be addressed. Landowners include Cyprus (for the lower Barn Canyon area) and the USBLM. As access to upper Barn Canyon is not restricted, there should be no concerns of consequence.

Findings:

As this is considered a private road, the permittee does not need Division approval to conduct mining activities. All activities will occur on surface owned by Cyprus.

PROPOSED VARIANCE FROM REGULATORY STANDARDS

Regulatory Reference: R645-301-527 Transportation Facilities.

Analysis:

Submittal reference 5.4.1.3 Proposed Variance from Regulatory Standards (Page 5.4-2)

The permittee is applying for a variance from the Division such that the reclamation of the Barn Canyon road is not necessary. As noted above, the Barn Canyon road is considered a private road; Page 4.5-10 of this submittal classifies this pre-SMCRA road as a primary road, and Map 33 shows that drainage controls are to be implemented upon approval of this submittal, and that the road up to and including the air shaft pad is within the disturbed area boundary. On page 5.4-2, the permittee commits to reclaiming the drainage controls installed to upgrade the road to primary.

Findings

The Barn Canyon road meets the following requirements, classifying it as a primary road.

- 1) 301-527.121. It will be frequently used for access to provide, at a minimum, weekly inspection capability of the emergency escape hoist, most likely for the operating life of the mine.
- 2) 301-527.123. The portion of the Barn Canyon road that lies above the air shaft pad will remain in perpetuity; there is no logic in requiring the permittee to reclaim any length of the Barn Canyon road, with the exception of the truck passing areas utilized during the shaft construction phase.
- 3) 301-527.230 and 240. The submittal commits to maintaining the road throughout the intended life of mine usage (Text reference 4.5-49a).

The Barn Canyon road is classified as a primary road (PR-19, see page 4.5-48 of text) that will continue to provide access to the upper ridges of this area long after coal mining activities cease in the area. It should not be required to be reclaimed.

Regulatory Reference: R645-301-742.412. Locating a Road in an Ephemeral Channel

Analysis:

Submittal Reference: 4.5-6

The Barn Canyon road has been located in portions of the canyon drainage for at least 40 years; to require the permittee to relocate the road would create extensive and unnecessary environmental degradation.

The flows in this channel have been minimal for many years, as indicated by the amount of vegetation in same. Typical flows (10 yr-6 hr event) will be diverted off the road in two areas where the road is in the channel; ditches, culverts, and water bars will be constructed to do this.

Submittal Reference: 4.5-6a

The permittee is also requesting a variance from the requirements of R645-301-521.261-262, Stream Buffer Zone.

Due to the narrow steep confines of Barn Canyon, it is impossible to construct the air shaft 100 feet from the ephemeral channel. The pad will be constructed using elevation and appropriately designed methods of drainage bypass to route flows around the shaft as required by the R645 regulations. These can be found in Exhibit 13 and on Map 33.

Findings:

The permittee's request to be granted variances from the requirements of relocating a road in an ephemeral channel and those of meeting stream buffer zone requirements are justifiable because of the narrow steep confines of the Canyon. Although recent past flows appear to minimal, the 10 yr-6 hr event has been used to design the drainage control and bypass mechanisms for the shaft pad. The variances should be granted.

SUBSIDENCE CONTROL PLAN

Regulatory Reference: R645-301-521. 301-525, 301-724.

Subsidence Control Plan.

Submittal Reference: Maps 19-A through 19-D, Text reference 4.5-31

Analysis:

The Division's initial deficiency response indicates from Map 20 that the Barn Canyon area is within the subsidence zone. **This map has a P.E. certification date of 2/12/96**, and shows longwall panels on an approximate 45 degree angle to Willow Creek. Since that time, a completely new redesign of the underground entries (necessitated by adverse geologic conditions) has generated a new Map 19-A (longwall panels are now essentially perpendicular to Willow Creek). The redesign places sub-main entries (secondary extraction does not occur) in that portion of the Barn Canyon drainage where the air shaft will be located. Hence, the new Map 19-A (P.E. certification 6/24/98) shows the Barn Canyon air shaft outside of the potential subsidence area. Projected zones of impact caused by subsidence were generated using an angle of draw of 22.5 degrees.

Findings:

The redesign of the underground entries as indicated by the new Map 19-A (P. E. certification 6/24/98) places the Barn Canyon air shaft outside of the potential subsidence zone. The permittee needs to submit a new Map 20, Subsidence Monitoring Plan, which shows the correct zones of potential impact for the various coal seams relative to the redesign of the underground works. Monitoring point locations on this map will remain the same. The submittal of this update map is not necessary to achieve a recommendation for approval of this amendment.

Certified Engineering Designs

Regulatory Reference: R645-301-512 Certification.

Submittal Reference: 4.5.1.8 Certification, Inspection, Reporting, and Emergency

Procedu
res

Analysis:

Map 31, Barn Canyon Shaft Facility and Map 32, Barn Canyon Surface Facilities-Postmining Topography have been P. E. certified by David E. Hansen, of Hansen, Allen and Luce, Inc.

Findings:

The requirements of this section of the R645 regulations have been met.

RECLAMATION PLAN

Regulatory Reference: R645-301-540. Reclamation Plan.

Submittal Reference: Page 5.4-7 Disposal of Concrete Debris

In the first submittal of this amendment, it was the permittee's intent to permit a surface disposal area for concrete construction debris. At that time, this inspector was concerned with the number of areas at the site that were to be permitted for that purpose and the shallowness of the regraded slopes upon reclamation. It is now the permittee's intent to dispose of concrete debris in the air shaft prior to sealing. It should once again be noted that the permittee will need to implement safety controls to properly conduct this disposal.

Findings:

The submittal now adequately addresses the concerns, of this inspector, regarding the disposal of shaft site construction debris.

MINE OPENINGS

Regulatory Reference: R645-301-513, 529, 551, 631, 748, 765.

Submittal Reference: Page 5.4-8, paragraph 4, Map 32, Barn Canyon Shaft Facility-Post Mining Topography

Analysis:

The permittee is committed to capping the shaft with five foot thick frustum of a concrete cone. The plug will be anchored into the shaft walls with transverse steel beams set into slots cut into the sides of the raise. The rebar inherent in the concrete plug will extend into drilled holes in the shaft lining. Four feet of incombustible material will cover the plug to protect it from frost action. This is depicted on Map 32. A two inch by fifteen foot (above the ground surface) MSHA approved vent pipe will disperse methane accumulations from the shaft, consistent with 30 CFR 1711-1.. The permittee will need to consider a support structure for the vent pipe, as well as grounding requirements (CFR 30, Part 75.700-1 (d)).

Map 32 meets the necessary requirements for P.E. certification.

Findings:

The submittal adequately addresses the requirements for the management of mine openings relative to the reclamation plan for the air shaft.

HYDROLOGIC INFORMATION

Analysis:

Protection of Surface Water Quality

Submittal Reference: Text, page 4.7-10, paragraph 5\

The permittee anticipates that the interception of groundwater during the shaft construction will be minimal, (see Section 3.7.9.1). However, if groundwater is intercepted, it will be pumped to the surface and stored in a tank, until it can either be trucked or piped (temporary line) to the raw water process pond near the preparation plant's train loadout facility. The raw water pond is a closed loop system, that will allow settling time for any suspended solids. This contingency plan is felt to be adequate.

As no design has been submitted for the air shaft, there is no method to handle ground water flows in the vicinity of the air shaft during its operational life. Page 4.7-10 indicates that continuous flows will merely be allowed to discharge to the "D" seam workings. This is fine; however, ice buildup in air shafts or behind the concrete lining of same during the winter months can completely shut off air flow or render the escape hoist useless. If sufficient flows are encountered during the construction phase, methods of handling this water need to be incorporated into the shaft's design criteria.

Findings:

The permittee has a plan in place which is acceptable to handle a small volume of intercepted ground water. This should handle any water problems encountered during the shaft's construction phase. Surface water quality and the Barn Canyon drainage will be protected. The requirements of the R645 regulations regarding this concern have been adequately addressed.

CONCLUSION:

This submittal should have been broken into two phases (1) the environmental issues phase, and (2) the construction requirements/civil engineering phase. It appears that the consulting firm either is not aware of the requirements of R645-301-524.200, and 230 and R645-301-526.220. Support Facilities or the civil engineering and blasting designs necessary for this submittal are beyond their realm of expertise.

I would like to recommend that, pending approval of the other disciplines involved, the environmental issues portion of this submittal be approved, with the stipulation that the necessary blast and shaft designs be submitted as an addendum prior to (by no less than 72 hours) the initiation of the blasting/construction. This will enable the permittee to take care of the access road issues, prepare the site for construction, and allow time for the necessary designs to be generated.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

HYDROLOGIC RESOURCE INFORMATION

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

Analysis:

Surface-water information.

The Barn Canyon contains an ephemeral drainage. By regulatory definition this drainage is intermittent because it is greater than 1 square mile.

Probable hydrologic consequences determination.

The Bear Canyon Ventilation shaft will be sealed with a 5 foot re-enforced upward expanding concrete plug on top of the bulkhead, buried by 4 feet of soil cover and, re-enforced with rock around it's base. It is expected that this seal will result in minimizing potential impacts to the hydrologic balance by preventing runoff from entering the underground entry. The applicant shows the ventilation portal location in relation to the postmining drainage along the road on Map 32.

This amendment does not require changes to the current PHC, however, other site conditions have changed and sections in the plan need to be updated. Currently in mine water was determined to have toxic characteristics that are not monitored under the approved UPDES permit at the surface water discharge points. The plan indicates the Barn Canyon ventilation area will intercept little to no ground water that would need to be discharged. However, it is proposed that any discharged water from the Barn Canyon shaft construction be conveyed to a temporary tank then to the raw water pond, page 4.7-10. The existing plan, in section 4.5-27, allows for ground water to be routed to the minewater storage tank or, allows for ground water discharge storage of 1.0 acre foot at Sedimentation Pond 001. The mine water intercepted previously was not identified to be a potential under the approved permit. Because of the unexpected poor water quality at this source, all intercepted ground water must be retained underground or, analyses must be provided for any water discharged to surface sources. The permit still needs to be amended to acknowledge many of the changes associated with the minewater intercepted.

Findings:

This amendment does not meet the minimum requirements of this section. The amendment must include the following:

R645-301-730. All intercepted ground water that needs to be discharged to the surface must undergo analyses according to the Division baseline requirements and approval must be obtained from the Division prior to being discharged to any surface facilities or surface facility storage location.

OPERATIONAL PLAN

GENERAL

Analysis:

The plan references several different disturbed area values. Section 4.5-4 identifies 0.36 disturbed acres. Section 4.43 and exhibit 13-65, identifies 0.28 acres disturbance and the wildlife section identifies 0.98 acres disturbance. These may all refer to specific portions within the disturbed area but, that is not clear.

Findings:

This amendment does not meet the minimum requirements of this section. The amendment must include the following:

R645-301-120. Clarify the references to the quantity of disturbed area between section 4.5-4, section 4.43, and the discussions in the wildlife section.

HYDROLOGIC INFORMATION

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

Analysis:

Discharges into an underground mine.

No discharge into an underground mine is applied for or granted with this amendment.

Diversions.

Diversions around the fan portal were provided and sized to convey runoff from a 10 year - 6 hour event. The area draining to the fan portal is considered miscellaneous drainage and the main undisturbed by pass ditch is located on the edge of the pad along the concrete retaining wall. This ditch collects flow that spills over the retaining wall. The disturbed area will be graded toward a low flow channel and treated downstream with silt fence or straw bales. Ditch UD-24 is not shown to drain to any existing drainage features but, will join road ditch DD-31. The last 5 feet of this ditch are to be flattened and expanded to convey runoff across the road.

Drainage designs associated with the ventilation shaft access road are presented on Map 33. The mine intends to retain the existing road for access to the site. Currently the existing road conveys the canyon drainage in some locations. The existing road is stable showing no signs of instability or major erosion. (This was verified on May 13, 1998: See the DOGM field visit form). Minimal alterations are proposed to improve the existing road including 2 passing areas, two swales, two culverts and two adjacent road ditches DD-31 and DD-32. Some road cutting will be required in two locations to control drainage.

Crushed gravel is proposed to be used where grading creates an erodible surface. However the fine materials often brought in with crushed gravel can add to the sediment loading and in this case may exceed the potential sediment contribution from the existing road/soil sub-base characteristics. Standard road base includes +200 mesh as the lower size limit. Erosion studies have shown soil erodibility increases as aggregate size decreases. Erosion increased by 1.4 times when a mean diameter of 3.0 decreased to 0.75

mm and erosion increased 7.5 times when an aggregate size decrease from 0.75 to 0.355 mm. Erosion rates doubled in aggregates further decreased to 0.21 mm. Clean gravel should be used and limiting crushed gravel use to material screened to + 8 mesh (2.38 mm) would minimize the potential for contributing sediment to undisturbed areas.

Stream buffer zones.

The ventilation pad is within an ephemeral drainage. An existing road will be utilized for access and maintenance issues. The existing road is aligned in the drainage through the canyon. Stream Buffer zone regulations are applicable to this site by definition because the site drains a watershed greater than one square mile. The minimum design requirements for the 10 year- 6 hour event on the road is considered adequate based on the following:

- Existing site conditions suggest this channel has not received flows at the 10 year- 6 hour event design magnitude (peak discharge of 42.5 cfs) for some time.
- The proposed road is to be used for maintenance access after construction is completed.
- The proposed design will promote runoff to flow into existing stream channels rather than the current conditions which convey flow along portions of the road and by-pass natural stream channel sections.

The Division is granting an exemption to R645-742.412 with requiring the following as permit conditions in accordance with R645-301-730.

- Clean gravel will be used, particles smaller than + 8 mesh (2.38 m.m.) will be removed.
- Truck wash down from cement mixing associated with the site construction will be drained into the thickener pond.
- Gravel use will be minimized and applied only in the areas designated on Map 33. Swale construction will avoid placing gravel in the flow path from the existing natural channel. (Development will begin downstream from the natural channel to minimize contributing sediment to the channel).

Sediment control measures.

The sediment control plan is presented on the Barn Canyon Fan Pad Site Plan (Map 31). Design calculations are provided in Exhibit 13. An Alternate Sediment Control measure (ASCA) is used to treat the sediment coming from the Barn Canyon ventilation site. The volume of water required to be treated for a 10 year- 24 hour event is equal to 945 ft³. To pass the peak flow from the event through the silt fence requires 32 linear feet when allowing a water depth of 0.25 feet to accumulate behind the fence. The pad access ramps are not treated by siltation structures but, they employ alternate sediment control measures by, minimizing the area and slope and by surfacing with gravel.

Topsoil will be transported to the Gravel Canyon topsoil stockpile. Sediment control measures for the topsoil storage area include surrounding the storage site with a berm, roughening the surface and establishing vegetation.

Exemptions for siltation structures.

No exemption from siltation structures was requested or granted associated with the Barn Canyon

ventilation portal amendment.

Findings:

This amendment does not meet the minimum requirements of this section. The amendment must include the following:

R645-301-730. The Division is granting an exemption to R645-742.412 with the following provisions to be conditions of the permit: 1) Clean gravel will be used, soil particles smaller than + 8 mesh (2.38 m.m.) will be removed. 2) Gravel use will be minimized and applied only in the areas designated on Map 33. Swale construction will avoid placing gravel in the flow path from the existing natural channel. (Development will begin downstream from the natural channel to minimize contributing sediment to the channel). 3) Truck wash down for cement mixing associated with the site construction will be drained into the thickener pond.

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.

Analyses:

Map 19A shows subsidence outside of the permit area. By definition this is a coal mining and reclamation activity that needs to be conducted within the permit area boundary.

Findings:

This amendment does not meet the minimum requirements of this section. The amendment must include the following:

R645-300-141. Coal Mining and Reclamation Operations will be conducted only on those lands specifically designated as the permit area. The mining layout must be adjusted to keep subsidence within the permit area.

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.

Analyses:

In section 5.4.1.3 under AOC variance the applicant claims that reclaiming the road would disturb soils and vegetation for no reason and the road will be "retained to prevent unnecessary environmental degradation" on page 5.4-12 are not acceptable statements and they should be removed from the plan. Reclamation would, over the long term, reduce erosion and increase vegetative cover.

Findings:

This amendment does not meet the minimum requirements of this section. The amendment must include the following:

R645-301-742-240. To make the permit accurate the following statements must be removed. In section 5.4.1.3 under AOC variance #2, wherein the applicant states reclaiming the road would disturb soils and vegetation for no reason and the information on page 5.4-12 which states the road will be "retained to prevent unnecessary environmental degradation".

RECLAMATION HYDROLOGY

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

Analyses:

Diversions.

The postmining topography is presented on the Post Mining Topography (Map 32). Reclaimed Barn Canyon Fan Site slopes will exceed 2H:1V. To transition the slopes from the disturbed to the natural topography. The CPMC has committed to establish a post mining configuration compatible with the natural drainage pattern of the surrounding terrain. No diversions are proposed during reclamation however minor re-configuration of the ephemeral drainage will occur.

The reclamation plan indicates the culverts will be removed and the road ditches will be retained. Information in section 5.4.1.3 conflicts with other discussions in the plan. During the reclamation period the road can not be brought to it's existing configuration because it will not meet drainage requirements for reclamation. A reclamation configuration that meets the regulatory requirements needs to be provided for road retention.

Sediment control measures.

The areas using alternate sediment control measures during reclamation are illustrated on Mine Surface Facilities area interim drainage control Map 21B. The reclamation sediment control measures to be applied at this site are roughening, straw bales and silt fencing.

Findings:

This amendment does not meet the minimum requirements of this section. The amendment must include the following:

R645-301-742-240. A reclamation configuration that meets the regulatory requirements for road drainage needs to be provided for the Barn Canyon Road proposed to be retained following mining.

RECOMMENDATION:

It is recommended that these deficiencies be incorporated into the plan prior to construction or they may be attached as stipulations to the approval. The permittee will also need to resubmit the information that updates Exhibit 13 for insertion into the October 1997 submittal. These changes will be checked for compatibility while reviewing Exhibit 13.

Analysis:

On page 4.5-27 of Amendment 98B the Operator states:

A modification to the mine ventilation plan was necessitated in the later part of 1997 wherein it was discovered that subsurface geologic conditions were interfering with original mine layouts and ventilation plans. To adequately control ventilation within the mine, a vertical shaft and ventilation fan was proposed for immediate construction within Barn Canyon.

The Operator needs to modify the mine plan because they encountered old stream channels in the coal. The modifications include constructing a ventilation shaft in Barn Canyon and changing the mine layout.

The purpose of R645-301-526 is to ensure that the Division has reliable information on the underground mining activities. The Division uses that information to ensure that all mining activities comply with the regulatory program.

R645-301-528 deals with the handling and disposal of coal, overburden, excess spoil and coal mine waste. In the MRP the Operator states " *that mine development waste placed in the existing Schoolhouse Canyon refuse stockpile for permanent disposal.*" The coal mine waste will be disposed of by the approved method.

Findings:

The Operator met the requirements of R645-301-526 and R645-301-528 regarding describing the modifications to the mine plan and how the waste rock from the Barn Canyon shaft will be disposed.

Facilities and Structures

Analysis:

The Operator proposes to construction a ventilation fan shaft in Barn Canyon. The shaft is needed as part of the new ventilation plan. The Division will include the Barn Canyon shaft facilities into the reclamation bond calculations and include that site in future inspections.

Findings:

The Operator met the requirements of R645-301-526 regarding describing the Barn Canyon shaft.

RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: 30 CFR Sec. 784.18; R645-301-521, -301-526.

Analysis:

The Division needs to know if the access road to the Barn Canyon shaft is public or private. If the road is public then the Operator needs to address this section.

Findings:

The Operator did not meet the requirements of R645-301-121.100 by failing to state if the access road is public or private.

If the access road is public then the Operator did not meet the requirements of R645-301-526.116. The Operator needs to get the Division's approval for conducting mining operations within 100 feet of a public road and/or to relocate a public road.

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR Sec. 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Subsidence control plan.

Analysis:

Map 20 shows the location of the projected subsidence areas. Barn Canyon is in the projected subsidence zone.

The Operator did not address how subsidence would affect the Barn Canyon shaft and the access road. The Operator needs to address the requirements of R645-301-525 by describing the anticipated subsidence effects on the Barn Canyon shaft and the access road, and any subsidence protection plan.

Findings:

The Operator failed to meet the requirements of R645-301-525. The Operator must address how subsidence will affect the Barn Canyon shaft and the access road.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-732.

Road Systems

Analysis:

The Operator did not address the road issues. The Division is not sure if the access road to the Barn Canyon fan shaft is public or private. If the road is private then the Operator must classify the road and include it in the disturbed area. If the road is public then the Operator must address this issue.

Findings:

The Operator did not address the requirements of sections R645-301-521, R645-301-527 and R645-301-534 regarding the access road to the Barn Canyon ventilation shaft. If the road is private then the Operator needs to classify the road and supply the Division with designs.

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.

Analysis:

Coal mine waste.

The Operator is approved to dispose of all mine development waste in the Schoolhouse Canyon refuse site. The Operator did not specifically address where the development waste would be placed. The Division assumes that the development waste will be placed at the Schoolhouse Canyon refuse site.

The Division needs the Operator to clarify how the mine waste will be disposed. The Division needs this information to clarify where the mine waste will be disposed.

Refuse piles.

The Schoolhouse Canyon refuse pile is an approved site for the disposal of the underground development waste that will be produced from the Barn Canyon shaft. The Division assumes that all development waste will be placed at the Schoolhouse Canyon refuse pile.

Findings:

The Operator did not meet the requirements of R645-301-121.200. The Operator needs to state how they intend to dispose of the mine waste material.

The Operator met the requirements of R645 -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, regarding disposal of mine development waste from the Barn Canyon shaft.

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.

Analysis:

Affected area maps.

Map 31, Willow Creek Mine Barn Canyon Fan Pad Site Plan & Map, was certified by David Hansen a registered professional engineer. The Operator complied with the certification requirements of R645-301-512.

Map 31 has several deficiencies:

- The Operator shows the permitted disturbed area boundary and the maximum disturbed area boundary on Map 31. The distinction between the permitted disturbed area boundary Division does not understand the difference between the two disturbed area boundaries. The Operator must clarify the meaning of the two disturbed area boundaries. See R645-301-121.200.
- The Operator may not have shown all affected areas (disturbed areas) associated with the Barn Canyon shaft. If the access road is private then the Operator must include that road in the disturbed area boundaries. See R645-301-521.141
- The Operator did not provide a map of the proposed site that shows the slope extending 100 linear feet outside the disturbed area. See R645-301-521.152
- The Operator did not provide a map and cross section of the access road. That information is only needed if the road is not a public road. See R645-301-521.170
- Map 32, Willow Creek Mine Barn Canyon Surface Facilities Post Mining Topography, shows the contours and cross sections of the reclaimed Barn Canyon shaft area. Map 32 has contours on 5 foot intervals inside the disturbed area and 20 foot intervals outside the disturbed area. The contours in some areas extend for less than 10 feet from the disturbed area boundary. R645-301-542.300 allows the Division to set the specifications for all reclamation maps. The Division wants the reclamation maps to have the same specifications as the operation maps. The contour intervals inside and outside the disturbed area should be on at least 5 foot intervals and the contours should extend a minimum of 100 linear feet from the permit boundary.
- The Division needs cross section suitable for calculating volumes of soils to be moved during reclamation. The cross sections supplied by the Operator are not suitable to volume calculations. See R645-301-542.300.

Findings:

The Operator failed to meet the minimum requirements of R645-301-521 and 301-542 by not giving the Division:

- R645-301-121.200. State clearly where the disturbed area boundary is on Map 31.
- R645-301-521.141. Include the access road to the Barn Canyon shaft in the disturbed area. The Operator does not have to place the access road in the disturbed area boundary if the access road is a public road.
- See R645-301-521.152. Provide a map of the proposed site that shows the slope extending 100 linear feet outside the disturbed area.
- See R645-301-521.170. Provide a map and cross section of the access road. That information is only needed if the road is not a public road.
- R645-301-542.300. On Map 32 the contour intervals inside and outside the disturbed area should be on at least 5 foot intervals and the contours should extend a minimum of 100 linear feet from the permit boundary.
- R645-301-542.300. The Operator must supply the Division with cross section suitable for

calculating volumes of soils to be moved during reclamation.

Mine workings maps.

Analysis:

The Operator did not submit revised mine maps showing the location of the Barn Canyon shaft and other changes. One way to meet the requirement of R645-301-521.142 is to supply the Division with a copy of the MSHA maps.

Findings:

The Operator failed to meet the minimum requirements of R645-301-521.142 by not supplying the Division with updated copies of the mine maps.

RECLAMATION PLAN

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.

Analysis:

The pad area was previously disturbed. The Operator did not request that reclamation standards for previously mined areas be applied to the Barn Canyon shaft area. The Division will require the Operator to reclaim the site to the approximate original contours.

The Operator states in the Backfilling and Grading to Establish Final Configuration section of the MRP:

As can be seen from pre and post contours shown on the Barn Canyon Fan Pad Site Plan Map (Map 31) and the Barn Canyon Surface Facilities Area Postmining Topography Map (Map 32), reclamation contours will have the effect of eliminating pre pad disturbance and returning the contours to a more approximate natural configuration.

For the most part, backfilled areas at the Barn Canyon fan site will be placed at a 2H:1V slope since 1) the site has been previously disturbed and currently has slopes exceeding 3H:1V, 2) the site is located in a narrow canyon and slopes steeper than 2H:1V exceed available limits, and 3) natural local topography exceeds 3H:1H slopes. A small area located near the northern end of the pad will have reclaimed slopes exceeding 2H:1V. As can be seen on the Barn Canyon Surface Facilities Area - Postmining Topography Map, (Map 32) steeper slopes are required as a transition is made between the reclaimed surface and the adjacent natural topography.

Map 31 shows the reclaimed contours. That map does not adequately describe the reclaimed contours. The deficiencies for Map 32 are discussed in detail in the **MAPS, PLANS, AND**

CROSS SECTIONS OF MINING OPERATIONS section of this TA. The Division cannot approve the backfilling and regrading plan until we have adequate maps and cross sections.

The Division agrees with the general backfilling and reclamation plan. The general reclamation plan calls for 2H:1V slopes. Since the site is in a narrow canyon, the reclaimed slopes will be similar to the surrounding area that has slopes between 3H:1V and 2H:1V.

The Division usually considers 2H:1V slopes to be stable. Slopes steeper than 2H:1V are considered suspect for failure. The Division needs to have a cross section of that slope. The Operator must also show that the slopes will have a safety factor greater than 1.3.

Findings:

The Operator did not meet the requirements of R645-301-553. The backfilling and grading plan is not adequately shown on Map 32.

- R645-301-542.300. On Map 32 the contour intervals inside and outside the disturbed area should be on at least 5 foot intervals and the contours should extend a minimum of 100 linear feet from the permit boundary.
- R645-301-542.300. The Operator must supply the Division with cross section suitable for calculating volumes of soils to be moved during reclamation. The Operator must supply the Division with cross sections that show the slopes that are steeper than 2H:1V.

The Operator did not meet the minimum requirements of R645-301-553.130. The Operator must show that the slopes steeper than 2H:1V have a safety factor of at least 1.3.

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

In section Stabilization and Sealing of Mine Openings the Operator states:

The Barn Canyon ventilation shaft will be sealed using a permanent reinforced upward expanding concrete plug, or if more effective shaft sealing methods are available at the time of mine closure they may be utilized subject to UDOGM approval.

Concrete plugs is an effective method for shaft sealing. The main problem with concrete plugs is that they deteriorate over time. If more effective shaft sealing technology is developed, the Division will suggest that the Operator use the improved methods.

Findings:

The Operator met the minimum requirements of this section.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Analysis:

The Operator did not address the road reclamation. If the access road to the Barn Canyon shaft is private then the Operator needs to include the road in the disturbed area.

Findings:

The Operator did not meet the requirements of R645-301-121.100. The Operator must state if the access road to the Barn Canyon fan shaft is a public or private road. If the road is private then the Operator must include the road in the disturbed area and provide a reclamation plan for the road.

BONDING AND INSURANCE REQUIREMENTS

Determination of bond amount.

Analysis:

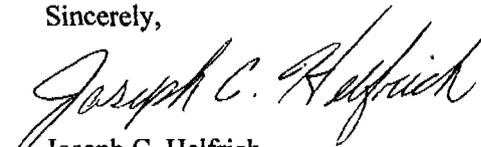
Since the reclamation plan has not been approved, the Division has not reviewed the reclamation cost estimates.

Findings:

The Division will not make a finding about the reclamation bond until the reclamation plan is approved.

If you have any questions, please call.

Sincerely,



Joseph C. Helfrich
Permit Supervisor