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# State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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April 5, 1993

Mr. R. Jay Marshall
Genwal Coal Company Inc.
P. O. Box 1201
Huntington, Utah 84528

Dear Mr. Marshall:

Re: Technical Deficiencies in Renewal Application, Genwal Coal Company, Crandall Canyon Mine, ACT/015/032, Folder #3, Emery County, Utah

The Division has completed a review of your recently updated Mining and Reclamation Plan which was submitted as part of your Permit renewal application. A number of deficiencies have been identified in the plan which will need to be corrected before it can be accepted as your plan.

The enclosed technical review document identifies the problems which require your attention. Please review the document and correct the deficiencies as quickly as possible. A response should be submitted to the Division by May 3, 1993 in order to allow the Division a few days to review the responses prior to your renewal deadline.

Please call if you have any questions.

Sincerely,

Daron R. Haddock
Permit Supervisor

Enclosure
cc: B-Team
TECHDEFI.GEN

TECHNICAL COMPLETENESS REVIEW
PERMIT RENEWAL

**GENWAL COAL COMPANY**
**CRANDALL CANYON MINE**
**ACT/015/032**
**APRIL 2, 1993**

## INTRODUCTION

This document contains information derived from a review of Genwal Coal Company's newly submitted Mining and Reclamation Plan. Mine plan deficiencies found in that review have been identified under the deficiency heading in each section. Some of the deficiency sections contain possible methods for resolving the deficiency. In order for the Applicant to be in compliance with the Utah Coal Mining Regulations each of the items discussed in the deficiency section must be addressed.

## R645-301-112 Identification of Interests

**Proposal:**

The Applicant, Genwal Coal Co., is a corporation. Jay marshall is identified as the resident agent. Genwal is owned jointly by Intermountain Power Agency and Nevada Electric Investment Company. Names and addresses of officers, directors, and principal shareholders of these companies are listed.

The legal owners of the area to be affected by surface operations are Mountain Coal Company and the United States. The legal owner of the coal to be mined is the United States. Holders of record of leasehold interest in surface areas and coal to be mined are shown on page 1-6. Owners of both surface and subsurface rights are shown on pages 1-6 and 1-7.

**Analysis:**

The plan does not include the Applicant's employer identification number. Also, the person who will pay the abandoned mine reclamation fee is not shown.

R645-301-112.300 requires that the plan include dates positions were assumed for each person who owns or controls the Applicant.

On page 1-5, the plan states that IPA is currently engaged in the reclamation of the Horse Canyon Mine, but the Wellington Preparation Plant is not identified as an operation owned or controlled by the Applicant or those who own or control the Applicant. These are the only operations that are known by the reviewer for Utah, but any operations that come under R645-301-112.400 for other states also need to be identified. The plan shows the permit number for the Wellington Preparation Plant on page 1-7. The plan needs to include the State permit number, MSHA number and date of issuance, and employer identification number for all operations owned and controlled by either the Applicant or anyone who owns

or controls the Applicant.

The legal owner of coal to be mined needs to include the State of Utah. The State also needs to be identified as a surface owner for part of the permit area. The plan doesn't mention whether there are any purchasers of record under real estate contracts.

**Deficiencies:**

1. The plan must include the Applicant's employer identification number. Also, the person who will pay the abandoned mine reclamation fee needs to be shown.

2. The plan needs to include dates positions were assumed for each person who owns or controls the Applicant.

3. The plan needs to include the names, addresses, identifying numbers, including employer identification number, Federal or State permit number, and MSHA numbers and dates of issuance for any coal mining and reclamation operations owned and controlled by either the Applicant or by any person who owns or controls the Applicant. This also needs to include ownership or control relationship to the Applicant, including percentage of ownership and location in organizational structure.

4. The plan needs to include the State of Utah as an owner of the coal to be mined and as a surface owner for part of the permit area. The plan should state whether there are any purchasers of record under a real estate contract for the property to be mined.

**R645-301-113 Violation Information**

**Proposal:**

Violation information is included for the Crandall Canyon Mine. Neither the Applicant nor any subsidiary, affiliate or persons controlled by or under common control with the Applicant has had a mining permit suspended or revoked in the last five years, and they have not forfeited a mining bond or similar security.

**Analysis:**

The violation information section of the plan needs to state whether or not there are any unabated cessation orders or air and water quality violation notices received prior to the date of the application by any coal mining and reclamation operation owned or controlled by

either the Applicant or by any person who owns or controls the Applicant. If there are none, the plan should contain a statement to that effect.

R645-301-113.320 requires that the violation information contain a brief description of each violation alleged in the notice. Pertinent regulations are included for violations issued starting in 1990, but these regulations do not provide a description of each violation. Some of the regulations cited simply imply that a condition of the permit or a commitment in the plan was not met.

**Deficiencies:**

1. The plan needs to state whether or not there are any unabated cessation orders or air and water quality violation notices received prior to the date of the application by any coal mining and reclamation operation owned or controlled by either the Applicant or by any person who owns or controls the Applicant. If there are none, the plan should contain a statement to that effect.

2. The plan needs to contain a brief description of violations alleged in the notices listed in the plan.

**R645-301-114 Right of Entry**

**Proposal:**

The right of entry is based on two federal and two State leases. Genwal also has an underground access special use permit assignment from the Forest Service. There are five other special use permits which include use of the road, use of areas to store topsoil, use of the turnaround area for snow storage and summer parking, construction of portions of the pond and portals areas, and 50 acres for potential surface effects of underground mining.

**Analysis:**

The Lease by Application areas shown on Plate 1-1 are substantially different from the description contained in Attachment A in Appendix 1-1. The permit application does not include these areas, however. If the Lease by Application areas are to be shown in the plan, the maps and legal descriptions need to correspond.

Appendix 1 includes right of entry information for State leases 23178 and 23177. These leases are also not part of this permit application and should be removed.

On page 1-13, the right-of-way information should reference the appendix where the right-of-way number and legal description are contained.

In the introduction to the plan (before Chapter 1), there are some discrepancies that need to be corrected. In the second paragraph, the first lease number is shown as U-5476. It should be U-54762. The next sentence says that there is one Forest Service special use area in Crandall Canyon. As mentioned above, Genwal has five special use permits for the mine.

Also in the introduction, the acreage figures for the mine plan area on page 4 don't add up. 6.09 + 0.9 - 0.34 - 1.1 = 5.55. The difference in the figures is the acreage shown for the road.

**Deficiencies:**

1. If the Lease by Application areas are to be shown in the plan, the maps and legal descriptions need to correspond. Plate 1-1 and Attachment A in Appendix 1-1 do not agree.

2. The reference to the underground access special use permit shown on page 1-13 should reference the appendix where the right-of-way number and legal description are contained.

3. The discrepancies in the introduction to the plan need to be corrected as discussed in this analysis.

| | |
|---|---|
| **R645-301-115** | **Unsuitability Claims** |
| **R645-301-116** | **Permit Term** |
| **R645-301-117** | **Insurance, Proof of Publication** |
| **R645-301-118** | **Filing Fee** |
| **R645-301-123** | **Notarized Signature** |

**Proposal:**

The permit area is not within an area designated or under study for designation as unsuitable for coal mining and reclamation operations.

The Applicant has requested a permit term of five years.

The plan includes a copy of the insurance Acord form.

An application fee of $5.00 was received by the Division on January 19, 1993.

**Analysis:**

The application is required to contain the notarized signature of a responsible official of the Applicant that the information contained in the application is true and correct to the best of the official's information and belief. This statement and signature was not found within the plan.

A copy of the newspaper advertisement for the permit application will need to be filed with the Division and made part of the application no later than four weeks after the last date of publication.

**Deficiencies:**

1. The plan must contain the notarized signature of a responsible official of the Applicant that the information contained in the application is true and correct to the best of the official's information and belief.

**R645-301-121.200. Be clear and concise; and**

**Proposal:**

References to the old UMC regulations are found on pages 2-2, and 2-9 of Chapter 2 and possibly elsewhere in the MRP.

**Analysis:**

The MRP must clearly address the regulations which are currently in use. The UMC regulations were superseded by the R645 regulations in 1992. Genwal Coal Co. signed an application for permit change accepting the governance of the R645 regulations on 1/29/92.

**Deficiencies:**

1. All references to regulations within the MRP should be revised to refer to the R645 regulations to ensure full communication between the public, Genwal Coal Co. and the Division.

2. Page 4 of Appendix 2-3, Soils Study, is missing in all copies of the plan.

3. A designation on Plate 5-3 north of (behind) the coal storage retaining wall is not in the legend of the plate.

4. Contour intervals described on Plate 2-1 are incorrect. The correct interval is

10' as opposed to 2'.

**R645-301-131. Names of persons or organizations**

**Proposal**:

E.I.S. is referred to in Chapter 2., page 2-3 as the organization which collected and analyzed data included in the MRP.

**Analysis**:

The full business name of E.I.S. should be used to clearly identify the organization conducting technical work at the mine site.

**Deficiencies**:

1. The business which is represented by the initials E.I.S. referred to on page 2-3 of Chapter 2 should be clearly identified by the full business name.

**R645-301-200. SOILS**
**R645-301-230. OPERATION PLAN.**
**R645-301-231.300. Testing plan**

**Proposal**:

Sampling of the topsoil storage piles prior to soil redistribution is addressed in Chapter 2, page 2.10 of the MRP.

**Analysis**:

The bonding calculations in appendix 5-20 reveal that a single lab sample will be analyzed. This does not agree with the description of the soil fertility testing of the topsoil piles (see page 2-10).

**Deficiency**:

1. The bonding calculations should be revised to accurately reflect plans committed to in the Mining and Reclamation Plan with regard to testing of the topsoil piles for fertility. (See description of tests on page 2-10, Chapter 2.)

**R645-301-231.400.** **Narrative that describes the construction, modification, use and maintenance of topsoil handling and storage areas.**

**Proposal**:

Plate 2-3 shows the location of the three topsoil piles with reference to the location of surface facilities. Plate 2.2 supersedes Plate 3-8 and provides contours, cross-sections, area, yardage for each topsoil pile.

**Analysis**:

Section 8.3.2 of the *approved* plan indicates that 8,410 cubic yards are required for topsoiling of 5.15 acres of disturbance with one foot of topsoil or substitute topsoil. The plan for the recovery of 8,410 $yd^3$ is presented. An estimated 5,171 $yd^3$ of topsoil and 3,239 $yd^3$ of subsoil were to have been salvaged from the site prior to disturbance (page 8-8 of the *approved plan*).

Actual stockpiled soil amounts to 3701 $yd^3$ of topsoil and substitute topsoil.

Page 8-6 of the *approved* plan indicates that there is temporary storage of topsoil above the substation pad and across from the coal stockpile and above the #2 stockpile. And, Section 8-7, page 8-8 of the *approved* plan also indicates that topsoil and subsoil is stored adjacent to the public parking area on the USFS road (the trailhead). Soil stored in these locations is designated for final reclamation of areas above the substation pad and across from the coal stockpile. References to these temporary storage piles is no longer in the MRP. Genwal investigated the area opposite the coal loadout and determined (by probing, see pages 2-3 and 2-4) that the depth of the soil was less than 2'. The present reclamation plan does not include redisturbing the "wooded" area opposite the coal loadout or the trailhead or the undisturbed vegetation within the disturbed area.

Genwal must determine where likely sources of substitute topsoil are located and provide identification of those sources on a surface facilities map as well as in the narrative.

**Deficiencies**:

1. The location of adequate substitute topsoil should be determined and indicated on a surface facilities map and in the narrative to eliminate the present deficit of topsoil material stored in piles on site (see also R645-301-233, 'Deficiencies' #1 and #2). The approved topsoil depth is 1 foot.

**R645-301-233. Topsoil Substitutes and Supplements.**

**Proposal:**

A plan to remedy the topsoil deficiency described above under R645-301-231.400 is not included in the plan.

**Analysis:**

The plan is inadequate in describing the area of disturbance requiring topsoil replacement and in addressing the volume of topsoil required for acres disturbed. The amount of topsoil in the stockpiles is itemized in Plate 2-2 at 3,701 cubic yards of material.

The presently approved MRP commits to the replacement of one foot of soil material over the entire site (page 8-8, Chapter 8). The Division calculates that for the 6.65 acre site, this will require 10,728 cu yds of stockpiled soil (reduced slightly by the area to remain as an access road but increased slightly by the slope of the reclaimed site). The applicant has a serious shortage of topsoil, the stockpiles account for only one-third of the amount calculated to be required.

**Deficiency:**

1. The MRP should describe a plan for salvaging substitute topsoil during regrading of the site or of salvaging additional material from the present topsoil storage areas to remedy the topsoil deficiency presented in the renewal submittal of 1/12/93. The approved topsoil depth is 1 foot.

2. The applicant must provide the Division with information on the quality and suitability of the potential substitute topsoil (item 1, above) according to the requirements of R645-301-233 et seq.

**R645-301-234. Topsoil Storage.**

**Proposal:**

A discussion of topsoil protection measures was not found within Chapter 2 of the MRP. The presently approved plan has such information in Section 8-7.

**Analysis:**

A description of the methods utilized to protect the topsoil piles is necessary since the performance standard of R645-301-250 reflects the plans provided under R645-301-200. The

renewal submittal should indicate the measures taken to protect the topsoil stockpiles along the forest service road from degradation by road salt (snow plowing) and water erosion.

Presently, the three stockpiles within the disturbed area are protected by an asphalt berm, and strawbales. Several inspectors over the past two years have described the potential contamination of topsoil by snow clearing activity. The plan should indicate what precautions are being taken to limit the potential contamination with salts from the road.

A commitment is lacking in the plan to gain approval prior to moving stored topsoil as per R645-301-234.240.

**Deficiencies**:

1. The Mining and Reclamation Plan must provide a description of the methods which are in use to protect the topsoil stored along the Forest Service road from water and wind erosion, and accumulations of sediment and salts.

2. The plan must include a commitment to maintain the stockpiles in their present configuration until required for redistribution as per R645-301-234.240.

**R645-301-240. RECLAMATION PLAN.**
**R645-301-242. Soil Redistribution.**

**Proposal**:

Calculations on page 2-8 list the acreage requiring topsoil coverage as 4.07 acres. (This figure is actually 4.97 acres. It is incorrectly calculated on page 2-8.)

Topsoil and subsoil salvage did not produce the amount of material projected in the approved plan. Approximately 3,700 $yd^3$ have been salvaged and stored in three topsoil pile locations.

**Analysis**:

Previous calculations (page 8-3, Section 8-3 and Plate 3-1 of the approved plan) were reported as 6.03 acres of disturbed land less 0.03 acres of undisturbed ground and less 1.2 acre of road, arriving at 5.15 acres. (This figure also appears to be inaccurate as 6.03 ac - [0.03ac + 1.2 ac] = 4.8 acres.)

The acreage of topsoil storage areas has been increased from .62 to .9 acres with this submittal. The undisturbed areas within the disturbed area has been increased from 0.03 acres to 0.48 acres in the narrative and by 0.13 acres from Plate 3-1 (dated 12/20/89) to

Plate 5-3. The rational for changing disturbed and undisturbed acreage should be discussed with the Division.

The approved MRP provided a commitment to return 12" of topsoil cover to the disturbed area. Five acres would thus require at a minimum 8,066 $yd^3$ of topsoil and/or substitute topsoil. Presently, the storage piles of topsoil and subsoil total 3,700 $yd^3$. This is enough for 2.3 acres at 1 foot deep.

The renewal submittal suggests 6 inches of coverage over the 5 acres, a minimum of 4,033 $yd^3$ required. (Topsoil coverage would actually be less than these calculations due to the effect of slope. The bonding calculations indicate that the majority of the land to be seeded has greater than 30% slope. The cross-sections on Plate 5.17a indicate slopes of 70-100%.)

Genwal's proposal to reduce final cover down to six inches is not recommended for approval. Genwal should abide by their previously approved commitment to return one foot of topsoil to the reclaimed areas. A concerted effort to determine where additional subsoil can be salvaged (during final reclamation) for substitute topsoil use should be undertaken. i.e. reduce the size of the 70' wide roadway as shown in cross-sections 5.17a. The location of substitute topsoil must be specified in the plan and on a surface facilities map, to ensure adequate protection under R645-301-232.200 of the subsoil 'in situ'. Bonding calculations in Appendix 5-20 should be adjusted for the additional loading, hauling, grading, scarification, and fertilization of the additional substitute topsoil material.

Cut/Fill calculations in Appendix 5-20 indicate that 6197 $yd^3$ will be excavated and hauled (page 3 of 7). Calculations at the end of this appendix show that only 2,530 $yd^3$ will be obtained from cut and the remaining fill will be obtained from the topsoil storage piles. Grading plans should not include topsoil as backfill.

**Deficiency**:

1. The total acreage requiring topsoil replacement on page 2-8 should be corrected to read 6.65 acres disturbed - [ 0.48 acres of undisturbed area + 0.9 acres of roadway] = 4.97 acres.

2 A verification of the disturbed and undisturbed acreage changes in the renewal submittal should be discussed with the Division.

2. The commitment to replace one foot of topsoil should be maintained in the present submittal and sources of additional substitute topsoil to make up the approximately 5,000 $yd^3$ deficit must be located (see 'Deficiencies' under R645-302-233 and R645-301-231.400).

3. Bonding calculations should be revised to account for the additional substitute topsoil material which will be loaded, hauled, graded, scarified and fertilized under the presently approved plan of 12 inches of topsoil cover.

4. Grading plans and cut/fill volumes provided in Appendix 5-20 must not include the topsoil as backfill material, bonding calculations in Appendix 5-20 and reclamation designs must be revised accordingly.

**R645-301-244. Soil Stabilization.**

**Proposal:**

One ton of alfalfa hay will be incorporated into the redistributed topsoil and substitute topsoil prior to seeding (page 2-10).

**Analysis:**

This procedure is a good husbandry practice. The additional costs for incorporation of the alfalfa hay into the regraded surface prior to seeding was not noted in the cost estimates.

**Deficiency:**

1. The bonding cost estimates should include the treatment of regraded substitute topsoil and topsoil with 1 ton of alfalfa hay mulch.

**R645-301-321 Vegetation Information**

**Proposal:**

The plan contains quantitative descriptions of spruce/fir/aspen, mountain shrub/grassland, riparian, mixed mountain shrub/conifer/aspen, and previously disturbed vegetation communities near the portals. The reference area is in a mountain shrub/grassland community.

The plan also includes vegetation maps of other parts of the permit area without the more detailed description given for areas near the portals.

**Analysis:**

Appropriateness of the reference area is discussed under R645-301-341.250. The

information provided in this section of the plan is adequate to establish standards for success and to formulate the revegetation plan.

Federal lease stipulations, including those contained in the approval for Chapter 14, require a plan to monitor the effects of underground mining on vegetation. The plan needs to include some detail of this plan, including methods and frequency of monitoring.

**Deficiencies**:

1. The plan must include a plan to monitor the effects of underground mining on vegetation in accordance with lease stipulations.

**R645-301-322 Wildlife Information**

**Proposal**:

The plan includes studies of aquatic resources of Crandall Creek. One of the studies originally indicated that Crandall Creek was not a fishery, but the plan also says that it is used by fish for spawning and as habitat for mature fish. The first report was written in 1980, and it appears that the stream contained beaver ponds which blocked fish access up the stream. The 1983 report by Wildlife Resources (DWR) indicates that the very high runoff that year destroyed all of the beaver ponds. This DWR report contains some fish survey information for Crandall Creek.

The plan contains general and site-specific descriptions of terrestrial wildlife use of the area and maps showing critical habitat in the area for some species. The permit area, including the disturbed area, contains critical habitat for moose, but the plan states that there is a tremendous volume of adjacent unoccupied habitat suitable to absorb displaced moose.

**Analysis**:

Some attempts were apparently made to alter the 1980 report on the aquatic resources of Crandall Canyon to conform with later observations. This is not appropriate since the report contains observations made by the consultant. The plan contains qualifying statements indicating that the stream is now used as a spawning and nursery stream and that it is also used by mature fish.

February 21, 1992, correspondence from DWR states that the moose herd in the area is developing and that adequate habitat is essential if the herd is to sustain itself. The letter was primarily concerned with potential loss of stream flows and degradation of riparian habitats rather than the effects of the already-operating surface facilities.

The plan states on page 3-7 that the golden eagle nest high on the ridge northeast of the portals is the only raptor nest in Crandall Canyon according to information supplied by DWR. This statement is deceptive because, although this may be the only information supplied by DWR, the plan discusses other nests in Crandall Canyon within and near the permit area (see pp. 41-42 of Valley Engineering's "Vegetation and Terrestrial Wildlife Report"). In addition, other nests may have been built in the area since the survey was completed. The statement on page 3-7 should be changed to state that other nests were found.

Prior to the cover sheet for the Valley Engineering report is a page that indicates that pages 1-39 of the report are found in item 9-1 in Chapter 9. This sheet appears to have been carried over from the previous plan and should be eliminated.

In Chapter 14, the plan refers to Appendix 13-3 which is a letter from DWR discussing a survey of the state lease areas for cliff-nesting raptor nests and habitat. This letter states that there were no nests found and that the areas do not contain good cliff-nesting habitat. This letter and reference to it needs to be carried over into the new plan. The letter does not say that work was done to identify tree nests. The aspen and conifer areas near the streams probably contain good accipiter nesting habitat that could be affected by subsidence. Of particular concern is the goshawk. Correspondence dated February 21, 1992, to the Division from DWR states that, in addition to cliff-nesting raptors, the area contains potential habitat for a number of other raptor species. It says that monitoring should determine if active nest sites of these species are established and if potential damage from subsidence could occur. The mining and reclamation plan needs to contain a plan to address this concern. If it is determined that there is a potential for damage from subsidence, a protection or mitigation plan must be developed. Details should be developed in consultation with DWR and the Division and included in the plan.

The plan states on page 3-7 that an aerial survey of the golden eagle nest above the mine portals will be conducted every three years or on request of DWR or the U. S. Fish and Wildlife Service. The most recent monitoring of this nest of which the reviewer is aware was in 1991. It was inactive at that time. Second mining was apparently done in this area in 1991. Because second mining has been performed, further monitoring of this nest should not be needed after 1994. Genwal appears to have fulfilled their commitment to monitor the nest prior to conducting second mining, but the reviewer and Susan Linner of the Fish and Wildlife Service are not aware of coordination with the Fish and Wildlife Service to obtain a take permit for the nest prior to mining that could result in subsidence and loss of the nest. If the nest has been lost through subsidence and if a take permit was not obtained, Genwal is in violation of the performance standards and of the Bald Eagle Protection Act.

On page 3-6, the second sentence in the first paragraph under the heading "Migratory Birds of High Federal Interest" states, "In this area no expansive grassland hunting habitats and the existing levels of human activity - probably preclude this species from utilizing the

site and vicinity." This sentence appears to be out of place and should be deleted if it is not needed. There is no indication what "this species" is.

Several changes have occurred to the list of migratory birds of high federal interest since the plan and the consultant's report were first written. The consultant's report should not be changed, but the plan should be updated with the most current information. Information available to the Division indicates that the burrowing and flammulated owls and the black swift are no longer considered to be species of high federal interest. Several species that could occur in the area have been added to the list, including the goshawk, sharp-shinned hawk, red-tailed hawk, and Swainson's hawk. The list of migratory birds of high federal interest on page 3-7 should be updated, and any species that do not occur in the area could be deleted.

In the paragraph in the middle of page 3-7 is a sentence which reads, "No monitoring program to determine adaption of nesting golden eagle as the golden eagle was reported at the nest site the spring of 1980, both the nest site was inactive upon inspection by the DWR in 1987." This sentence needs to be rewritten to clarify its meaning.

Pages 3-6 and 3-7 cite several sources for some of the material. R645-301-122 requires that the plan contain explicit citations for referenced published materials, and the citations given in the plan are incomplete. For example, the plan says that five of the migratory birds of high federal interest could be in the area according to DWR (1978, 1981a, and 90-11). The plan needs to give a reference for the source of this information.

Although no threatened or endangered plant species were encountered in the vegetation survey, at least two sensitive (C2) species have been found in the general vicinity. Canyon sweetvetch (Hedysarum occidentale var. canone) is present in Huntington Canyon near the turnoff to Crandall Canyon. Intermountain bitterweed (Hymenoxys helenioides) has been collected in Carbon and Emery Counties in mountain brush, sagebrush, aspen, and meadow communities between 8800 and 10,700 feet elevation. The permit area probably contains suitable habitat for this species.

**Deficiencies**:

1. The statement on page 3-7 that the golden eagle nest high on the ridge north and east of the portals is the only raptor nest in Crandall Canyon according to information supplied by Wildlife Resources (DWR) needs to be changed to reflect the information provided in Appendix 3.

2. The page before the cover sheet for the Valley Engineering "Vegetation and Terrestrial Wildlife Report" needs to be eliminated or explained.

3. Appendix 13-3 from the old plan needs to be incorporated into the new plan.

4. The plan needs to contain a plan to determine if active nest sites of non-cliff-nesting raptors are established in the permit area and if potential damage could occur from subsidence. If there is a potential for subsidence-caused damage, a protection and mitigation plan must be developed.

5. The plan should state the year in which every third year monitoring of the golden eagle nest northeast of the portals began.

6. The second sentence in the first paragraph under the heading "Migratory Birds of High Federal Interest" on page 3-6 needs to clarify the meaning of "this species" or the sentence should be eliminated if it is not needed.

7. The list of migratory birds of high federal interest on page 3-7 should be updated, and any species that do not occur in the area could be deleted.

8. As discussed in the analysis section of this review, the second sentence in the paragraph in the middle of page 3-7 needs to be rewritten to clarify its meaning.

9. The plan needs to contain complete references for cited publications.

**R645-301-330 Operation Plan**

**Proposal**:

All surface areas which are disturbed and which will not be needed for mining operations will be revegetated. The seed mix to be used in final reclamation will also be used for interim stabilization. Plate 5-17 is a reclamation map showing post-construction contemporaneous reclamation areas and final reclamation. The disturbed areas within the mine plan area over which the water reports to the sediment pond which have been contemporaneously reclaimed will achieve 80% cover on the slopes. Appendix 3-5 contains details of the irrigation plan to maintain 80% cover.

The subsidence control plan is contained in Chapter 5. The land is used for domestic grazing on gentle slopes and for wildlife habitat and recreation over the total acreage. The vegetative resources should not be negatively affected by subsidence, so the current land use is expected to continue. As per the USFS, there is no marketable timber in the area of potential subsidence. Springs within the potential subsidence limit are a significant resource to the local wildlife and may be affected. If it is proven that mining activities have reduced the flow of any seep or spring by 50% or more, Genwal will develop a mitigation plan involving the use of guzzlers. If subsidence affects grazing, Genwal will compensate the appropriate party by paying the fair market value for the loss.

Most other impacts discussed in the plan have already occurred through mine and road construction.

**Analysis**:

Three plates depicting contemporaneous, interpreted to mean interim, and final reclamation need to be corrected:

> The disturbed area boundaries shown on Plates 5-16 and 5-17 are not consistent with Plate 5-3.
>
> Plate 7-5C shows some areas of final reclamation near Crandall Creek and above the area where the substation was formerly proposed to be. This is in conflict with Plate 7-5 which shows these as being post-1989 contemporaneous reclamation areas. It is understood through conversations with Genwal personnel that these areas may or may not be redisturbed upon final reclamation and that, for now, they should be considered interim revegetation areas.

In its February 21, 1992, correspondence to the Division, DWR stated that they consider an impact to a water source substantial if daily flows were reduced by 50% or more. The plan is in compliance with this assessment.

The plan needs to contain a commitment to educate employees about wildlife protection. DWR personnel have in the past expressed availability to participate in such a program. This is considered to be part of best technology currently available to protect wildlife.

**Deficiencies**:

1. Plates 5-16, 5-17, and 7-5C need to be corrected in accordance with the analysis presented in this review.

2. The plan needs to contain a commitment to educate employees about wildlife protection.

**R645-301-341.210 Species and Quantities of Seeds and Seedlings**

**Proposal**:

The plan contains one seed mix which is to be used for the entire area. It also includes a planting mix for areas near Crandall Creek.

**Analysis:**

The planting mix does not contain adequate trees that it is likely that the tree density standard for success will be achieved on most of the wooded area. The standard for success is 550 trees per acre. In most of the wooded area, only 500 trees will be planted per acre. An additional 110 willows per acre will be planted within 20 feet of drainages. With 10% mortality, the areas within 20 feet of drainages should have 549 trees per acre, but even with 0% mortality, assuming no natural recruitment, areas not within 20 feet of drainages will only have 500 trees per acre. Therefore, the plan needs to propose planting greater numbers of trees, at least 610, in the wooded areas. A 10% mortality rate may be overly optimistic, and the Operator should consider planting more trees than this.

The seed list contains three introduced species. They are all highly desirable and should not be overly competitive with or displace native species in the area. Small burnet and yellow sweet clover are fairly short-lived species that will probably not be present at final bond release.

**Deficiencies:**

1. The tree planting plan needs to be revised to show enough trees being planted in the areas not within 20 feet of drainages that it will be possible to achieve the tree density standard for success.

**R645-301-341.250 Success Determination Measures**

**Proposal:**

A vegetation reference area has been established in the mountain shrub/grassland community above the mine portals for comparison with all areas for final bond release.

Standards for woody species density have been set at 1336 shrubs per acre as per reference area baseline data and 550 trees per acre as per Forest Service recommendations.

The plan also includes diversity standards for the different plant communities that existed prior to disturbance. These set minimum and maximum relative cover values for grasses, shrubs, and broadleaf forbs. In addition, the plan states that no one species will make up more than 60% of the cover in its respective vegetation class except that individual species of shrubs and trees will make up no more than 80% of the density for this class.

The plan gives a monitoring schedule and methodologies for checking success of revegetation.

**Analysis**:

This section of the plan is fairly complete, but there are some problems that need to be addressed. The regulations require that for areas that are being reclaimed to a wildlife postmining land use, one of the success standards is tree and shrub density. 80% of trees and shrubs must have been in place for at least 60% of the liability period (6 years), and no trees and shrubs in place for less than 20% of the liability period (2 years) can be counted toward the success standard. Because of this requirement, it is necessary that the plan include revegetation monitoring for at least trees and shrubs in years 4 and 8. It is recommended that the monitoring schedule be altered to include complete quantitative evaluations in years 2, 4, 9, and 10. Woody species density would need to be measured in year 8. Limited qualitative monitoring should be done every year to identify potential problems.

R645-301-353.140 requires that the vegetative cover be capable of stabilizing the soil surface from erosion. Genwal needs to propose a method of demonstrating that this requirement has been met. Even if vegetative cover is equal to that of the reference area, the reclaimed area may not be stable. It is recommended that the Operator contact the Division for some possible methods.

R645-301-356.250 states that for areas previously disturbed by mining that were not reclaimed and that are remined or redisturbed, at a minimum, the vegetative ground cover will be not less than the ground cover existing before redisturbance and will be adequate to control erosion. The vegetative ground cover existing before redisturbance was 50.3%. Relatively little of this cover was from plants that would be considered weeds. This figure needs to be established as the vegetative cover standard for success for the areas previously disturbed by mining.

The reviewer has some concerns about the appropriateness of using a single reference area to evaluate revegetation success for the entire reclaimed area; however, this situation needs to be evaluated in the field before a requirement is made to change the reference area or to add another reference area. It appears that cover from trees and shrubs was measured in the reference area but it was not measured in the areas that were disturbed. Therefore, it is difficult to make a precise comparison. The reference area had 43.5% vegetative cover including the trees, and the spruce/fir/aspen areas that were disturbed had 45.2% vegetative cover, more than the reference area, *not* including the trees (except seedlings). The site should not be reclaimed to a vegetative cover standard lower than what existed prior to mining. It is not known how much the cover value in the spruce/fir/aspen area would increase if cover from the larger trees was included. This problem will be evaluated in a field visit this coming summer.

**Deficiencies:**

1. The final reclamation monitoring plan needs to include quantitative evaluations of tree and shrub densities 4 and 8 years after final reclamation to demonstrate that 80% of trees and shrubs have been in place for at least 60% of the liability period and that no trees or shrubs in place less than 2 years are counted toward the success standard.

2. The plan needs to include a method for demonstrating that the vegetative cover is capable of stabilizing the soil surface from erosion.

3. The vegetative cover standard for success for areas previously disturbed by mining that were redisturbed needs to be established in the plan as 50.3%.

**R645-301-342 Reclamation for Fish and Wildlife**

**Proposal:**

High value habitats (pinyon-juniper, agricultural and riparian areas) will be restored; in many cases, they will be enhanced beyond their premining condition. The goals are to create a diversified cover and/or habitat that will support a wide range of species while restoring to a premining condition and where feasible enhancing habitat. No additional enhancements are proposed during reclamation.

**Analysis:**

Revegetating the site to a vegetative cover and diversity standard approximately equal to the premining conditions will not be a wildlife habitat enhancement. According to information contained in the plan, the vegetation in the previously mined areas was not in a degraded condition before redisturbance. Revegetation of the other areas is also not considered to be an enhancement; it is simply revegetation using species that are desirable for wildlife habitat as required by the regulations. Enhancement means that the habitat will be augmented compared to the premining condition. The plan needs to either present a plan that uses the best technology currently available to enhance wildlife habitat or it must contain a statement explaining why enhancement is not feasible.

Consultation with DWR and the Forest Service to determine what enhancement measures are needed for this area is highly recommended. Some possibilities include constructing rock and brush piles during regrading (see R645-301-341.220 above); placing artificial habitat structures, such as nest boxes, in the area; and water developments.

**Deficiencies:**

1. The plan must include either a plan for enhancing wildlife habitat that utilizes the best technology currently available, or a statement explaining why enhancement is not practicable. Consultation with Wildlife Resources and the Forest Service to determine what enhancement measures are needed is highly recommended.

**R645-301-411 Land Use Environmental Description**

**Proposal:**

The premining uses of the land were non-developed recreation, native wildlife habitats, and dispersed cattle grazing. Because of the very steep topography, grazing is very limited on the side slopes.

The plan includes a map that shows grazing allotments in part of the permit area.

Emery County has zoned the area CE-1, critical environmental. This zoning designation does not preclude mining. The Manti-LaSal National Forest Land and Resource Management Plan includes the area in four different management units. These are the Leasable Minerals Area, General Big Game Winter Range, Range Forage Production, and the Riparian Management Unit.

The cultural resources surveys revealed one site located near the junction of the Forest Service and Huntington Canyon roads that probably meets the criteria for inclusion in the National Register of Historic Places. The area is outside of Genwal's permit area, and it has been fenced. Within the permit area, there are no public parks, cemeteries, or lands within the National System of Trails or the Wild and Scenic Rivers System.

The area was previously mined from 1939 to 1955. Approximately 35,000 tons of coal was removed from the Hiawatha seam by room and pillar methods.

**Analysis:**

R645-301-411.110 requires that the plan include a map and supporting narrative of the uses of the land existing at the time of filing of the application. Plate 4-1 shows oil and gas leases and grazing allotments for leases SL-062648 and U-54762, but it does not show land uses for the right-of-way and the two state leases. Other maps in the plan show vegetation communities in these areas, but they do not show land uses as required by the regulation.

The plan appears to contain information required to satisfy the other sections of this regulation.

Deficiencies:

1. The plan needs to contain a map which shows existing land uses of all land which will be affected by coal mining and reclamation operations.

**R645-301-412 Land Use Reclamation Plan**

Proposal:

The areas where surface disturbance resulted from mining operations will be restored to its premining usefulness as rangeland, wildlife habitat, and recreational use. No alternative land uses are proposed.

Analysis:

R645-301-412.200 requires that the plan include a copy of comments concerning the proposed postmining land use from the legal or equitable owners of the surface of the permit area and Utah and local government agencies which would have to initiate, implement, approve, or authorize the use of the land following reclamation. The citations from the Manti-LaSal National Forest Land and Resource Management Plan can be considered as comments from the Forest Service for most of the disturbed area. The plan states that the road will be left in place pursuant to the wishes of the Forest Service, the surface landowner. Appendix 1-2 contains correspondence from the Forest Service stating that the improved roadway is to be retained beyond the proposed life of the mine but that some reclamation will be required. This appendix needs to be referenced in Chapter 4.

The plan also needs to contain comments on the postmining land use from ARCO as Mountain Coal Company and from the State of Utah.

Deficiencies:

1. The plan needs to contain comments on the postmining land use from ARCO and the State of Utah. Also, comments from the Forest Service on the postmining land use for the road need to be referenced in Chapter 4.

**R645-301-512. Certification**

Proposal:

All maps, cross-sections, designs, and plans, as required will be prepared by,

or under the direction of, and certified by a qualified, professional engineer or land surveyor.

**Analysis**:

The Applicant has committed to have all maps, cross-sections, designs and plans prepared by or under the direction of, and certified by a qualified professional engineer or land surveyor.

Plate 5-6 Truck Loadout has the words *"certified drawing"* printed on it but has not been stamped by a registered professional engineer.

Plate 5-7 Rock Dust Silo has the words *"certified drawing"* printed on it but has not been stamped by a registered professional engineer.

**Deficiencies**:

1. Plate 5-7 Rock Dust Silo must be stamped by a registered professional engineer.

2. Plate 5-6 Crushing/Storage/Truck Loadout must be stamped by a registered professional engineer.

**R645-301-515** **Reporting and Emergency Procedures**
**R645-301-515.100**

**Proposal**:

At any time a slide occurs which may have a potential adverse effect on public, property, health, safety, or the environment, Genwal will notify the Division promptly of the problem. If any examination or inspection of the sedimentation pond discloses that a potential hazard exists, the Division will be promptly notified of the hazards and of the remedial measures to correct such hazards.

**Analysis**:

R645-301-515.100 requires that the Applicant notify the Division by the fastest available means at any time a slide occurs which may have a potential adverse effect on public, property, health, safety, or the environment.

The Applicant also needs to state that they will comply with any remedial measures required by the Division. The current wording suggests that the Division will only be informed of the remedial measures taken by the Applicant.

**Deficiencies**:

1. The Applicant will change the wordings of the first sentence of Section 5.15.10 (Reporting a Slide) from *"promptly"* to *"by the fastest available means"*.

2. The Applicant will commit to comply with any remedial measures required by the Division.

**R645-301-515.200 Impoundment Hazards**

**Proposal**:

If any examination or inspection discloses that a potential hazard exists, Genwal will promptly inform the Division of the finding and of the emergency procedures formulated for public protection and remedial action.

**Analysis**:

The Applicant left out the word *"action"* from the end of the sentence.

The Applicant did not address the procedures that would be taken if emergency procedures could not be formulated or implemented.

**Deficiencies**:

1. The Applicant will replace the word *"action"* with the phase *"remedial action"*.

2. The Applicant will state what procedures will be implemented in the event that a potential hazard exists and adequate procedures cannot be formulated or implemented.

**R645-301-520 Operation Plan**
**R645-301-521 General**
**R645-301-521.100 Cross-sections and Maps**
**R645-301-521.110 Previously Mined Areas**

**Response**:

Plate 5-1, 5-2, 5-2A and 5-2B show the location and extent of past and present

underground mining operations.

**Analysis**:

Plate 5-2 shows the Township but not the Range in which the mine is located. Plate 5-2's legend has the abbreviation L.B.A. which is not defined.

Plate 5-1 shows old working, lists unknown regions.

**Deficiencies**:

1. The Applicant will list both the Township and Range on Plate 5-2.

2. The abbreviation L.B.A. will be defined in Plate 5-2's legend.

**R645-301-521.120 Existing Surface And Subsurface Facilities and Features**

**Proposal**:

The location of surface and subsurface man-made features within, passing through, or passing over the proposed permit area are combined on Plate 5-3. Other detail plans are shown on Plate 5-4, 2-2, 5-6, 5-7, 5-8, 7-4A and 7-6A.

**Analysis**:

Plate 3-1 Surface Facilities dated December 20, 1989 contains several features not listed on Plate 5-3, such as corrugated metal pipes and riprap.

Plate 5-6 Crushing/Storage/Truck Loadout has not been stamped by a registered professional engineer.

Plate 5-7 Rock Dust Silo has not been stamped by a registered professional engineer.

Plate 7-4A Sediment Pond Detail As Built the legend list small riprap and large riprap but does not define the two products.

**Deficiencies**:

1. The Applicant must include features such as corrugated metal pipes and riprap on Plate 5-3.

2. Plate 5-6 and 5-7 must be certified and stamped by a registered professional

engineer.

3. Plate 7-4A will have the small and large riprap defined in the legend.

**R645-301-521.130 Landowner and Right of Entry and Public Interest Map**

**Proposal:**

The owners of record of those lands both surface and subsurface, included in or contiguous to the permit area are shown on Plate 1-1. The permit area on which the applicant has the legal right to enter is shown on Plate 5-3.

Appendix 1-1, 1-2, 1-3, 1-4 and 1-5 shows the legal right of the Applicant to enter and begin coal mining and reclamation operations, and the measures to be used to ensure that the interest of the public and landowners that could be affected by the mining and reclamation operations are protected under R645-103-234.

**Analysis:**

The Applicant did not list the ownership of Section 36 and 2 on Plate 1-1. Those section are state leases and it is possible that the coal owner and surface owner are different.

Some of the lettering on Plate 1-1 is illegible because it is to small.

Neither Plate 1-1 or 5-3 show the entire permit area.

**Deficiencies:**

1. The Applicant will list the surface and subsurface owners for Section 36 and 2 on Plate 1-1.

2. The Applicant will increase the letter size as needed on Plate 1-1 in order to make all lettering legible.

3. The Applicant will show the complete permit boundary area on a plate and reference it in the text.

**R645-301-512-140 Mine Maps and Permit Area Maps**

**Proposal:**

Plates 5-2, 5-2A, and 5-2B show the boundaries of all areas affected by mining operations. Plate 1-1 shows an additional proposed permit area that is, at this time, being

evaluated under a Lease by Application by the United States Forest Service. Plate 5-3 shows the surface area within the permit that will be affected during the life of the mining operation.

Analysis:

Plates 5-2, 5-2A and 5-2B show the boundaries of all areas proposed to be affected over the estimated total life of the coal mining and reclamation operation.

The underground workings and the location and extent of areas in which planned subsidence mining methods will be used and which includes all areas where the measures will be take to prevent, control, or minimize subsidence and subsidence related damage are not shown on the plates cited in 5.21.14 of the MRP

Deficiencies:

1. The Applicant will provide the Division with maps that show the underground workings and the location and extent of areas in which planned subsidence mining methods will be used and which includes all areas where measures will be taken to prevent, control, or minimize subsidence and subsidence related damage.

**R645-301-521.160 Maps and Cross-sections of the Proposed Features for the Proposed Permit Area.**

Proposal:

Maps produced by Genwal will show the facilities, disturbed area, disturbed area boundary, explosive storage and point source discharge for their specific requirement. These maps are located with this application.

Analysis:

The Applicant has stated that all the maps that are required in this section are located in the MRP. The Applicant does not site what maps meet the requirements of this section. The Applicant states that these are map(s) that show the location of explosive storage facilities. An explosive storage facility is not shown on the surface facilities map.

Deficiencies:

1. The Applicant will list those maps that contain the information required under this section.

2. The Applicant will list the map(s) that show the location of the explosive magazines, if they exist. If the explosive magazines do not exist the Applicant will not refer to them in this section.

**R645-301-521.170 Transportation Facilities Maps**

**Proposal:**

This application describes each road and conveyor system to be constructed and used by the Applicant as required by R645-301-527.

**Analysis:**

The Applicant has not stated what maps meet the requirement of this section.

**Deficiencies:**

1. The Applicant will list those maps that describe the roads and conveyor that are constructed, used, or maintained within the permit area.

**R645-301-521.180 Support Facilities**

**Proposal:**

The Applicant has not addressed this section.

**Analysis:**

The Applicant needs to address this section.

**Deficiencies:**

1. The Applicant must address section R645-301-521.180.

**R645-301-521.240 Mine and Permit Identification Signs**

**Proposal:**

The Applicant failed to address this section

**Analysis:**

The Applicant must address this section

**Deficiencies:**

1. The Applicant will address section R645-301-521.240.

**R645-301-523 Mining Methods**

**Proposal:**

Room and Pillar is the current mining methods. Retreat mining will be done in accordance with the approved MSHA roof control plan. All pillars in the mine are expected to be pulled with the exception for barrier pillars and those needed for safety or economic reasons. Longwall mining may occur in the future.

The only seam that will be mined is the Hiawatha. Coal thickness ranges from 5.5 to 6.5 feet.

Pillar designs and related information are described in this section and Appendix 5-1 to 5-4.

**Analysis:**

On page 5-12 in the middle of the fourth paragraph the Applicant states "Assuming a uniaxial compressive strength of 2200 psi, a coal height of 6 feet, 20 foot wide entry development, and 70 foot square pillars, the resulting factor of safety is 11.7 within this area, very close to the value of 12, recommended in the SME Mining Engineering Handbook as described above". The value of 12 described in paragraph 2 of page 5-12 and page 13-104 of the SME Handbook refers to the ratio of pillar length to average coal thickness.

**Deficiencies:**

1. The Applicant will replace the term "factor of safety" with "ratio of pillar length to average coal thickness" in the forth paragraph on page 5-12.

**R645-301-524 Blasting and Explosives**

**Proposal:**

There are no structures or dwellings within one mile of the mine permit area. All blasting will be done under the direction of a person trained, examined and certified as

provided by 30 CFR 850 and applicable regulations of the State Industrial Commission.

The Applicant will post blasting signs, in accordance with R645-301-510. Signals audible within a half mile, will be given prior to and after the blast as outlined in R645-301-465.

The amount of explosives used within any 8 millisecond period will be determined with the following equation as outlined in R645-301-651.

Blasting will be done so as no fly rock will leave the permit area, where practical.

**Analysis**:

R645-301-510 is the introduction to the engineering section and does not relate to posting blasting signs. Regulation should not be cited unless they are relevant.

R645-301-465 and R645-301-651 do not exist.

The Applicant states that no fly rock will leave the permit area, where practical. The term where practical is vague and needs to be defined. The regulations do not permit fly rock from leaving the permit area.

**Deficiencies**:

1. The Applicant will cite the correct regulations. R645-301-510 is the introduction to the engineering section and does not directly pertain to any specific blasting requirements. R645-301-465 and R645-301-651 do not exist.

2. The Applicant will modify blasting procedure to insure that R645-301-524.633 are met. That regulation requires that flyrock traveling in the air or along the ground will not be cast from the blasting site - more than one-half the distance to the nearest dwelling or other occupied structure; beyond the area of control required under R645-301-524.530; or beyond the permit boundary.

**R645-301-525 Subsidence**

**Proposal**:

The Applicant sites as reference material *"Some Engineering Geologic Factors Controlling Coal Mine Subsidence in Utah and Colorado"*, Geologic Survey Professional Paper 969, by C. Richard Dunrud. 1976, "SME Mining Engineering Handbook", Volume 1, by Arthur B. Cummis and Ivan A. Given, 1973. Reference is also made to Peng which is

assumed to be "Coal Mine Ground Control" by Peng and reference materials developed in the United Kingdom by Gentry and Abel which is assumed to be the 1975 National Coal Board study.

The maximum amount of vertical subsidence predicted by the reference material is 3.9 feet. The values were calculated by reducing the coal height by 20% which represents the unrecoverable coal in the pillared areas ( a six foot coal height was assumed due to lack of data), then multiplied by 70% to obtain the maximum possible vertical subsidence.

Subsidence induced horizontal movement that would create slope failure is not expected to occur along the escarpment because only limited coal outcrop occurs within the lease. Horizontal movement creating tension or compression cracks can not be projected due to the overburden thickness and lack of jointing density and attitude data along the surface rock exposures.

Analysis:

The Applicant assumed a coal seam thickness of 6 feet for a worst case scenario, however the mine plan calls for mining coal 9 feet or greater. The maximum subsidence amount would be 5 feet if a 9 foot coal seam is assumed.

Horizontal movement can be projected to the surface. The horizontal movement can not be used to accurately predict escarpment failures, however they can be used to help access risks. That information can be used to design mine layouts that reduce surface disturbances.

Deficiencies:

1. The Applicant will replace the 6 foot coal seam with a 9 foot coal seam for the worst case subsidence scenario.

**R645-301-525-100 Subsidence Control Plan**

Proposal:

The Applicant states that the subsidence control plan addresses the requirements of UMC 784.20 and UMC 817.121-.126. The plan is an amendment to the original application filed on Dec. 17, 1980.

There are no manmade structures, utility right-of-ways, and public or private resources necessitating protection from subsidence. The occurrence of subsidence will not produce material damage, diminution of value, or foreseeable use of lands. There is the

possibility that some groundwater resources could be effected.

Other coal mines in the area have mined coal using similar methods without causing any substantial material damage.

**Analysis**:

The Applicant must either show that there is no potential for material damage or submit a subsidence control plan. The Applicant has demonstrated that there are no structures that could be damaged by subsidence. There is the potential for damage to natural resources, such as ground and surface water. The Applicant must therefore comply with all the requirements of R645-301-525.100 to R645-301-525.170.

**Deficiencies**:

1. The Applicant will replace the reference to the UMC 784.20 and UMC 817.121-126 regulations with the appropriate R645 references.

2. The Applicant must substantiate any and all claims that subsidence will not result in material damage or diminution of values of foreseeable use of lands.

**R645-301-525.110 Description of Coal Removal Methods**

**Proposal**:

The reserve area will be mined in the room and pillar method. This method is described in Section 5.23 of this chapter.

**Analysis**:

The room and pillar mining methods have been evaluated under section R645-301-523.

The subsidence control plan was developed for a room and pillar mining operation. However, the Applicant stated in section R645-301-523 that mining methods used, or to be used, consist of room and pillar, and longwall. Subsidence due to longwall mining has not been addressed.

**Deficiencies**:

1. The Applicant must commit not to conduct any longwall operations without first having the Division approve a revised subsidence control plan which

includes an evaluation of subsidence caused by longwall mining.

**R645-301-525.130 Description of Physical Conditions**

**Proposal:**

The Applicant has shown cover thickness on Figure 5-6. The coal seam high is shown on Figure 5-7. Figure 5-8 shows the structure top.

**Analysis:**

The Applicant is required to provide the Division with depth of cover, seam thickness and lithology. The Applicant has provided the Division with an overburden and isopach map. Those maps have a scale of 1 inch equals 2,500 feet. That scale is inadequate and must be increased.

The term structure top is not defined.

The Applicant has not provided the Division with the lithology of the area.

**Deficiencies:**

1. The Applicant will provide the Division with depth of cover and seam thickness maps that have scales no smaller than 1 inch equals 1000 feet.

2. The Applicant will define the term structure top and place it on Figure 5-8.

3. The Applicant will provide the Division with a lithologic description from the 500 feet below the Hiawatha seam to the highest point in the permit area.

**R645-301-525.140 Subsidence Monitoring**

**Proposal:**

The Applicant has committed to monitor subsidence by use of a Forest Service and Division approved aerial monitoring program.

The Applicant has agreed to provide the Division with:

1. Current mine maps and the area where second mining will occur.

2. The approximate dates when second mining will commence and terminate.

3. Monitoring dates.

4. The vertical and horizontal positions of all monitoring points and pins.

5. A visual subsidence/escarpment failure survey will be conducted at quarterly intervals at area where rockfall has taken place beneath escarpment areas visible from Huntington and Crandall Canyon for a period of two years after development mining within those areas.

During pillaring under the escarpment visual subsidence/escarpment surveys will be conducted at weekly intervals.

In the event that escarpment failures occur above pillar recovery areas the operator shall immediately cease pillar recovery in those area and notify the regulatory authority.

**Analysis**:

The Division and the U.S. Forest Service have approved the aerial monitoring program. The Division has also accepted the Applicant's Proposal to supply mine maps and plans on an annual basis.

The Applicant's proposal to visually inspect the escarpment is inadequate to detect failure. A photographic record should be taken to document any substantial failures.

The Applicant stated that if an escarpment failure should occur then mining operation in the area would cease and the regulatory authorities be notified. Pillaring operation would not resume until specifically approved by the regulatory authorities. Under current monitoring programs it would be very difficult to determine if mining was the major cause of escarpment failure and what should be done to protect the public. The Applicant needs to monitor the escarpment with extensometer or other device so that the Division can assess the impact that mining has on slope failure.

The Applicant has not addressed those escarpments that are not visible from Huntington and Crandall Canyon.

**Deficiencies**:

1. The Applicant must keep a photographic or other permanent record of the escarpment and any slope failure.

2. Before the escarpment becomes part of the subsidence area the Applicant will

install extensometers or other devices to determine what impact mining is having on escarpment stability.

3. The Applicant will submit an escarpment monitoring plan for those areas that are not visible from Huntington or Crandall Canyon.

**R645-301-525.150 A Description of the Anticipated Effects of Planned Subsidence**

**Proposal:**

The Applicant did not address this section.

**Analysis:**

The Applicant did not address this section.

**Deficiencies:**

1. The Applicant will address this section.

**R645-301-525.160 Mitigation of Damages**

**Proposal:**

Genwal has consulted with the BLM and received their concurrence with the conclusions presented in this document, a copy of the BLM correspondence may be found in Appendix 5-9.

Displacement of wildlife due to subsidence may be minimal.

Springs within the potential subsidence limit are significant resources and must be protected. If during the monitoring of the springs, it is proven that mining activities have reduced the flow of any seep or spring in the area by 50% or more work will begin on an acceptable mitigation plan. In the event that subsidence negatively impacts grazing the effected parties will be compensated.

**Analysis:**

The Applicant has not placed any correspondence with the BLM in Appendix 5-9. Without that documentation it is impossible to verify that the BLM, or any other state or

federal agency, has determined that no material damage or diminution of value or foreseeable use of lands is expected to occur. The Applicant did not present findings from the U. S. Forest Service or state agencies.

Deficiencies:

1. The Applicant will provide copies of the correspondence with the various state and federal agencies that show a determination was made that no material damage or diminution of value or foreseeable use of lands is expected to occur.

**R645-301-526. Mine Facilities**
**R645-301-526.100 Mine Structures and Facilities**

Proposal:

The Applicant describes the existing or proposed facilities.

Analysis:

The purpose of this section is to describe all structures and facilities that existed prior to the Applicant's mining operation. Facilities and structures that existed prior to the current operation and are not used by the Applicant are excluded from certain reclamation requirements.

Deficiencies:

1. The Applicant will state if there were any pre-existing structures or facilities.

**R645-301-526.115 A compliance plan for each existing structure proposed to be modified or reconstructed for use in connection with or to facilitate coal mining and reclamation operations.**

Proposal:

The Applicant did not address this section.

Analysis:

The Applicant did not address this section.

**Deficiencies:**

1. The Applicant will address this section.

**R645-301-526.116** **The measures to be used to ensure that the interests of the public and landowners affected are protected if the applicant seeks to have the Division approve: Conducting the proposed coal mining and reclamation operations within 100 feet of the right-of-way line of any public road, except where mine access or haul roads join that right-of-way; or relocating a public road.**

**Proposal:**

The Applicant did not address this section.

**Analysis:**

The Applicant did not address this section.

**Deficiencies:**

1. The Applicant will address this section.

**R645-301-527** **Transportation**
**R645-301-527.100** **The plan must classify each road.**

**Proposal:**

The forest development road from Huntington Creek to the truck turn around area will be maintained as a primary road, in compliance with the road use permit issued by the U. S. Forest Service. See Appendix 1-2 for post mining land use requests.
The Forest Service access road is also a primary road and will be retained as part of the post mining land use. The road from the main pad area to the portal area is classified as a primary road.

The ancillary road to the upper pad area is utilized by service vehicles on a very limited basis. That road has been reseeded.

Analysis:

The Applicant states that the forest access road will remain as part of the post mining land use in accordance with the Forest Service Permit. The permit is located in Appendix 1-2. The USFS road use permit was dated Feb. 10, 1988. Permission was grated to the Applicant in a letter dated Nov. 30, 1988 from the USFS to retain the Crandall Canyon Road beyond the proposed life of mine. The road management objectives for the area would require some reclamation of the roadway from a 20 foot finished surface to a 14 foot finished surface, however the basic roadway template is to remain.

The USFS has stated that the road use permit was updated at the time the road was paved with asphalt. The new permit needs to be included in the mine plan.

Deficiencies:

1. The Applicant will include a copy of the updated special use road permit for the Crandall Canyon road in the MRP.

**R645-301-527.200** **The plan must include a detailed description of each road conveyor, and rail system to be constructed, used or maintained within the proposed permit area.**

Proposal:

The Applicant describes the conveyor system that consists of a 1200 ton/hr 48" belt and a primary and secondary crusher system. Coal entering the primary crusher is processed and sent directly to the 650 ton silo. From the silo it is weighted and loaded onto coal trucks. Coal entering the secondary system is crushed and then deposited onto a 3000 ton capacity storage pile. A loader transfer the coal to a 3rd hopper and crusher where it is conveyed to the coal trucks. See Plate 5-3.

Analysis:

Plate 5-3 does not show the 3000 ton capacity storage pile.

The Applicant failed to provide any information on road as required by section R645-301-527.200 through R645-301-527.220. Those sections require a detailed description of the road that includes a map, cross-sections, and road specifications.

The Applicant failed to provide a maintenance plan as required by R645-301-527.230.

The Applicant failed to provide the Division with a commitment that if a road is

damaged by a catastrophic event, such as a flood or earthquake, the road will be repaired as soon as practical after the damage has occurred.

**Deficiencies**:

1. The Applicant will identify the 3000 ton capacity storage pile on Plate 5-3.

2. The Applicant will address section R645-301-200 through R645-301-527.220 as pertains to roads.

3. The Applicant will provide the Division with a maintenance plan describing how the roads will be maintained throughout their life to meet the design standards.

4. The Applicant will provide the Division with a commitment to repair the road in the event of a catastrophic event as required by R645-301-527.240.

**R645-301-528** **Handling and Disposal of Coal, Overburden, Excess Spoil and Coal Mine Waste.**

**R645-301-528.100** **Coal removal, handling, storage, cleaning and transportation areas and structures.**

**Proposal**:

The Applicant refers to section R645-301-526.

**Analysis**:

Section R645-301-526 does not specifically state how the facilities covered in this section will be removed.

**Deficiencies**:

1. The Applicant will state how the facilities covered in this section will be reclaimed.

**R645-301-528.200** **Overburden**

**Proposal**:

The Applicant did not address this section.

**Analysis:**

The Applicant did not address this section.

**Deficiencies:**

1. The Applicant will address this section.

**R645-301-529 Management of Mine Openings**

**Proposal:**

Five portals have been placed on the Starpoint Sandstone in the Hiawatha coal seam. Four of the five portals are used while one is sealed. Underground access from all mine openings are controlled by the operator during working and nonworking hours. Due to public access through the mine site a security person is located at the mine when mine personal are not present.

Permanent sealing of underground openings is discussed in Section 5.51 of this chapter.

**Analysis:**

The Applicant has described the portals. In the event of a temporary closure a security person will be located at the mine at all times.

The Applicant states that permanent sealing of underground openings is discussed in Section 5.51 of this chapter. There is no Section 5.51 in this chapter.

**Deficiencies:**

1. The Applicant will address portals sealing. If the procedure is not addressed in this section then the proper cross reference will be made.

**R645-301-530 Operational Design Criteria and Plans**
**R645-301-531 General**
**R645-301-532 Sediment Control.**

**Proposal:**

The Applicant states that designs for sediment controls are presented in Chapter 7 of

the MRP.

**Analysis**:

Chapter 7 of the MRP consists of 113 pages. The Applicant must make more specific cross references.

**Deficiencies**:

1. The Applicant must present specific cross reference between the R645-301-532 rules and Chapter 7.

**R645-301-533 Impoundments**

**Proposal**:

The Applicant identifies the sedimentation pond as the only impoundment at the Crandall Canyon Mine. The design for the sediment pond are presented in Chapter 7. In Chapter 7 the pond designs are stated to be in Appendix 7-6.

**Analysis**:

Chapter 7 of the MRP consists of 113 pages and Appendix 7-6 is also quite large. There are no cross references between the R645-301-533 rules and Chapter 7 or Appendix 7-6.

**Deficiencies**:

1. The Applicant will cross reference the R645-301-533 rule with Chapter 7 and Appendix 7-6. The cross references will include, but not be limited to:

   a. the minimum static safety factor

   b. if the pond meets the size or other criteria of 30 CFR 77.216 or located where failure would be expected to cause loss of life or serious property damage

   c. slope protection against surface erosion

   d. protection against sudden drawdown.

**R645-301-534 Roads**

**Proposal:**

The primary roads associated with the Crandall Canyon Mine have been located on the most stable available surfaces. They have been constructed and maintained according to Division standards. See Chapter 7 of this document for design criteria and drawings for drainage. See Section 5.27 for further information on these roads.

**Analysis:**

The Applicant's proposal is vague and broad. Chapter 7 is cited for the hydraulic information but there are no specific cross references. There is no information about static safety factors for embankments.

**Deficiencies:**

1. The Applicant will make specific cross references when not presenting the information required in this section.

2. The Applicant will show that all embankments have a minimum static safety factor of 1.3.

**R645-301-535 Spoil**

**Proposal:**

See Section 5.28 of this chapter.

**Analysis:**

Spoil is defined as overburden that has been removed during coal mining and reclamation operations. The Applicant did not address the spoil disposal in Section 5.28.

**Deficiencies:**

1. The Applicant will address the requirements of this section.

**R645-301-536 Coal Mine Waste**

**Proposal:**

See Section 5.28 of this chapter.

**Analysis:**

Coal mine waste is defined as coal processing waste and underground development waste. In Section 5.28 the Applicant states that only minor amounts of development waste will be generated and such material will be disposed of in pillar lines or stored in areas that have been mined and where no second mining is to be done. The coal is shipped as run-of-mine, which means that coal processing waste is not anticipated from the Crandall Canyon Mine. All underground waste disposal will be done in accordance with MSHA regulations.

Should the volume of coal mine waste significantly increase the Applicant has committed to dispose of those materials in a DOGM licensed facility.

**Deficiencies:**

1. The Applicant must provide the Division with documentation that MSHA has approved the underground disposal methods for coal mine waste.

**R645-301-537 Regrade Slopes**

**Proposal:**

If a slide should occur within the permit area the Applicant will notify the regulatory authority and comply with the remedial measures required by the regulatory agency.

Variances have been granted to Section UMC 817.1550-.176 as these sections infer 1:1 excavation slopes are unsafe and not acceptable in all materials.

A slope stability investigation was submitted by Delta Geotechnical Consultants and is included as Appendix 5-19. The geotechnical analysis determines that natural existing slopes have safety factors of 0.73, which means they should fail. Since the natural slopes have not failed that suggests that man-made slope are more stable than what the safety factors indicate.

Appendix 5-16 is a stability analysis of the storage pad (upper pad) at the Crandall Canyon Mine prepared by EarthFax Engineering, Inc.

**Analysis:**

The Applicant cited the UMC rules instead of the R645 rules. The Applicant has not referenced the exemptions granted by the Division for constructing steep slopes. The Applicant did not address the specific rules of the R645-301-537 section.

Deficiencies:

1. The Applicant will cite the R645 rules instead of the UMC rules.

2. The Applicant will submit copies of all exemption to the regulation that pertain to regraded slopes.

**R645-301-542** **Narratives, Maps and Plans.**
**R645-301-542.100** **Timetable**

Proposal:

All reclamation will commence with final grading. In September or October topsoil will be redistributed, nutrients and soil amendments if needed will be added. Seeding, transplanting and mulching will then proceed when moisture conditions are optimal for planting and seeding.

Analysis:

The Applicant failed to include in the timetable several important reclamation steps such as, but not limited to, demolition and removal of surface structures, reclaiming the roadway, and earthwork.

Deficiencies:

1. The Applicant will include in the timetable all major reclamation operations, such as, but not limited to, demolition and removal, portal closures, road reclamation, and earthwork.

**R645-301-542.200 to R645-301-542.320** **Final Surface Configuration**

Proposal:

All affected areas will be graded and restored to a contour that is compatible with natural surroundings. All final grading will be done along the contour to minimize erosion and instability unless this operation becomes hazardous to the equipment operators. Backfilling and grading will proceed so as to eliminate or reduce the highwall. Refer to Plates 5-16, 5-17 and 5-17A.

**Analysis:**

The Applicant has not demonstrated that the approximate original contours can be achieved.

**Deficiencies:**

1. The Applicant must provide additional information demonstrating that the approximate original contours can been achieved.

**R645-301-542.500 Timetable and Plans, Removal of Sedimentation Pond**

**Proposal:**

The only structures to remain after the mining operation will be the sedimentation system and all necessary diversions required to insure routing of all disturbed area drainage to the pond and diversions to maintain the integrity of the pond until requirements of R645-301-763.100 have been met.

Upon final cessation of mining the area will be reclaimed. Upon completion of the reclamation earthwork the sediment pond will be cleaned out. The sediment pond and associated control devices will be removed after criteria of R645-301-763.100 has been achieved. The sediment pond will then be reclaimed and revegetated according to the approved reclamation plan and the permanent runoff control system being completed.

**Analysis:**

The Applicant did not provide a timetable for sediment pond removal. The Applicant's plan for sediment pond removal is adequate.

**Deficiencies:**

1. The Applicant will provide a timetable for sediment pond removal.

**R645-301-542.600 Roads**

**Proposal:**

The Forest Service Development Road from Huntington Creek to the Forest Service turn around will remain as part of the post mining land use in accordance with the Forest Service permit shown in Appendix 1-2. The Forest Service will also remain as part of the

post mining land use.

All other roads used for the operation of the Crandall Canyon Mine, within the permit boundaries, will be reclaimed in accordance with R645-600 regulations.

**Analysis:**

The Applicant has stated that the Forest Service road will be retained. The sentence, *"The Forest Service will also remain as part of the post mining land use"* needs clarification.

The Applicant did not address sections R645-301-542.610 to R645-301-542.640.

**Deficiencies:**

1. The Applicant will clarify the sentence " The Forest Service will also remain as part of the post mining land use"

2. The Applicant will address sections R645-301-542.610 to R645-301-542.640.

**R645-301-542.700 Final Abandonment of Mine Openings and Disposal Areas.**
**R645-301-542.710 Closure and Management of Mine Openings**

**Proposal:**

When no longer needed for mining operations all entry ways or other openings to the surface from the underground mine will be sealed and backfilled. The portals will be backfilled with soil and two rows of solid concrete blocks placed across each entry and then backfilled to the surface and recontoured as shown on Plate 5-17. A drain will be placed in the western most portal.

**Analysis:**

The Applicant has described the general method for closing the portals. The Applicant should also include information on the removal of the bathhouse and other structures near the surface.

**Deficiencies:**

1. The Applicant will describe the procedures for removing the bathhouse and other underground structures near the entries.

**R645-301-542.720 through R645-301-542.742**
**Disposal of Excess Spoil, Coal and Noncoal Mine Waste.**

**Proposal:**

All waste material generated from the removal of the structures will be removed from the property and sold as scrap or disposed of in the appropriate approved state disposal areas.

**Analysis:**

The Applicant did not identify the disposal site for any of the waste materials. The haulage distance between the mine site and the disposal area must be determined. Transportation of waste materials is a major cost associated with demolition.

**Deficiencies:**

1. The Applicant will identify the state approved disposal site that would accept the waste materials.

**R645-301-542.800 Estimate of Reclamation Costs**

**Proposal:**

The Applicant estimated that the reclamation costs would be approximately $130,000.

**Analysis:**

The Applicant estimated reclamation costs at $130,000, which is a 51% reduction over the previous figure of $268,000. The bond estimate omitted several key costs.

**Deficiencies:**

1. The Applicant must submit an accurate estimate of the reclamation costs.

**R645-301-553 Backfilling and Grading**

**Proposal:**

Backfilling and regrading of disturbed lands has been committed to in order to restore all areas affected by surface operations as near as possible to the contour of the land prior to disturbance. Reclamation of affected areas, including revegetation is outlined in Section

817.111-117. All openings will be sealed as per the request of MMS letter.

The highwall above the coal stockpile area will be backfilled with as much material as is available. However, a substantial highwall will exist and a small flat spot will be left as a potential campsite.

**Analysis**:

The Applicant states that reclamation of affected areas including revegetation is outlined in Section 817.111-117. There is no Section 817.111-117 in the Applicant's Mine and Reclamation Plan. Chapter 8 deals with bond information, not reclamation plans.

The Applicant proposes leaving a highwall, but has not addressed the requirements for a variance from the approximate original contour restoration requirements as listed in Section R645-302-270 through R645-302-275.

**Deficiencies**:

1. The Applicant will replace the reference to Section 817.111-117 with the appropriate citation.

2. The Applicant must obtain a variance from the approximate original contours as outlined in section R645-302-270 through R645-302-275 or eliminate all highwalls.

**R645-301-600 Geology**

Chapter 14 referred to Chapter 6 of the M&RP for most of the geologic information, but Chapter 6 in the old, approved plan did not include the right-of-way and state leases. Chapter 6 in this renewal submittal is still lacking in geologic data needed to evaluate the mine plan, especially in the right-of-way and the state leases.

Hiawatha seam thickness is shown on an isopach map in Chapter 7 but the discussion in Chapter 6 is unclear as to what thickness of coal will be removed and if a realistic thickness for mined coal has been used in determining effects of subsidence. The overlying coal seams are described as uneconomical, but there are no data in Chapter 6 to substantiate this for the areas of the right-of-way and the state leases. The one coal analysis of the Blind Canyon seam in Chapter 6 indicates coal quality similar to the Hiawatha seam.

Language in Chapter 6 indicates that it has not been updated to include the Utah state leases or the right-of-way. Because of this, the following review does not contain detailed **Proposal** or **Analysis** sections to accompany many of the deficiencies, as the deficiencies

derive mainly from this overall failure to update.

Chapter 6 has been organized and divided to closely follow the format of the current State Regulations.

*page 6-1*

**6.10 Introduction.**

**Proposal**:

This chapter discusses geologic conditions within and adjacent to Genwal Mine Permit area, which consists of Lease Areas SL 062648 and UO54762.

**Analysis**:

Only the two federal leases are listed. The Right-of-Way and the two state leases that are also included in the permit area are not mentioned.

**Deficiency**:

1. The two state leases and the right-of-way and areas adjacent to them are not included in the description of the permit area.

**6.21 General Requirements.**

*page 6-2*

**Proposal**:

Regional geology is shown on Plate 6-1 and in Appendices 6-3 and 6-4. Local geology is on Figure 7-1.

**Analysis**:

The M&RP is a public document available for examination by interested parties, who may not be well acquainted with the area. The permit area is outlined partially on Plate 6-1 and is not marked on maps in Appendices 6-3 and 6-4. Copy quality of maps in the appendices is poor enough that it is difficult to locate the permit area using township and range coordinates; township and range coordinates do not appear to be marked on the index map in Appendix 6-4. Figure 7-1 has not been updated to include the state leases.

**Deficiency**:

1. The poor quality of the copies of maps in Appendices 6-3 and 6-4 limits their usefulness.

2. The state leases and right-of-way are not marked on Plate 6-1.

3. The permit area is not outlined on maps in Appendices 6-3 and 6-4.

4. Figure 7-1 does not have an up-to-date outline of the entire permit area and doesn't even include all of the area covered by the state leases.

*page 6-3*

**Proposal**:

Elevations in the permit area rise to 9600 feet and maximum overburden thickness is approximately 1700 feet with an average of 700 to 800 feet.

Due to erosion, no geologic formations which lie stratigraphically above the Price River Formation are present in the permit area.

**Analysis**:

This information has not been updated to include the state leases. Overburden thickness, maximum and average, should be considerably more when the state leases are included.

North Horn Formation, indicated by $T_w$ on Plate 6-1, is exposed at the surface over a large portion of the state leases and right-of-way.

The geology of Joe's Valley is not discussed. The surface water drainage divide between Joe's Valley and Huntington Canyon is one major regional feature of importance. Faults, especially those along the west side of East Mountain, and their roles as conduits or barriers to ground water movement between Joe's Valley and Huntington Canyon drainages need to be characterized. Additional issues related to these faults that need to be considered include: 1) subsidence induced landslides on the west slope of East Mountain; 2) possible effects on mine development and coal recovery; and 3) larger than predicted surface subsidence caused by remobilization of fault blocks along these fault surfaces.

**Deficiency:**

1. Comments on overburden thickness (and elevation) have not been updated to include the state leases, the right-of-way, and the adjacent areas.

2. Comments on geologic formations exposed in the permit area have not been updated to include the state leases, the right-of-way, and the adjacent areas.

3. The structural geology of Joe's Valley and the west side of East Mountain and potential impacts of mining on ground and surface water, landslides and slope failure, coal recovery, and subsidence are ignored in this section.

## 6.22 Cross Sections, Maps and Plans.

**Proposal:**

Stratigraphic sections are shown in Appendices 6-1 and 6-4 and drill hole results and cross sections are in Appendix 6-5. Geologic, Structure, and Overburden and Isopach maps are shown on Plate 6-1, Appendix 6-3, and Plate 6-2 respectively.

**Analysis:**

Plate 6-2 covers only the original permit area.

Deficiency 1.c. from Division Order #92-A maintained 1) that the mine layout for all existing and proposed mine workings should show the overburden contours; 2) that the contours should be projected over the entire permit area (not just the lease area); and 3) that they should be shown at a minimum contour interval of 100 feet and a map scale of 1"=500'.

Plates 5-2a and 5-2b show structural elevation of the coal seam and surface topography, from which the overburden thickness can be determined, over the active and proposed mine workings. The structure contours at the southwest corner of Lease ML 21568 appear to be unrealistic artifacts or edge effects of a contouring program, perhaps indicating insufficient geologic data in this area. Figure 5-6 shows overburden thickness for the permit and surrounding areas, at a contour interval of 100' and at a scale of approximately 1"=3000'. Wayne Western has stated that a scale of 1"=1000' will be sufficient, rather than 1"=500' as in the original deficiency.

**Deficiency:**

1. Overburden thickness is not mapped at a sufficiently large scale over the entire permit and adjacent areas.

**Analysis**:

Deficiency 2 from Division Order #92-A, under ***R645-301-622.Cross Sections, Maps and Plans.***, states that "Maps and cross sections indicating the location of all coal seams should be presented in the plan with sufficient detail to determine their potential minability. In those areas where the Operator has committed to accomplish additional drillhole information, the tentative locations of these holes, and the type of data to be collected from these holes should be characterized."

Deficiency 1 under ***R645-301-522.Coal Recovery.***, is similar, stating that the Operator must address and characterize all coal and rider seams found within the state leases.

Larry Johnson has indicated that isopachs for the coal seams above the Hiawatha were made for the R2P2; these maps should be added to the M&RP if they provide the needed information, especially for the state leases. Appendix 6-5 contains vertical sections showing the thickness and location of these seams relative to the Hiawatha seam, but only in the area of the original federal leases. Cross sections and maps in the M&RP do not show interburden and seam thicknesses and the extent of coal seams above the Hiawatha. There are insufficient data presented in the M&RP to determine the mineability (or un-mineability) of coal seams above the Hiawatha for the entire permit area. (Comments on the mineability of the overlying Cottonwood, Blind Canyon, and Bear and Upper Bear seams are on pages 14-1 and 14-2 of Chapter 14.)

Locations of additional underground drillholes are shown on Plates 5-2a and 5-2b, but the text has not been updated to describe them or the type of data to be collected from them. (These are described on page 14-2 of Chapter 14.)

**Deficiency**:

1. Maps and cross sections indicating the location of all coal seams in sufficient detail to determine their potential mineability have not been made part of the M&RP.

2. Information on the proposed in-mine drillholes is lacking.

**6.22.1 Test Borings and Coal Sampling.**

**Analysis**:

Bore hole and core sampling information for the federal leases is in Appendix 6-5 and on Plate 6-2.

Bore hole locations for the state leases are on Plate 5-2 but the labels are not legible

and there are no elevations; however, bore hole locations and elevations are on Plates 5-2A and 5-2B.

It is not clear which portions, if any, of the bore holes were cored.

**Deficiency**:

1. Maps, cross sections and plans referenced by this section of the M&RP do not show locations or elevations of test borings except for the locations of the two in mine up-hole borings done in federal lease SL 062648 (Plate 6-2 and Appendix 6-5).

2. Locations and elevations of core samplings are not clear from information given in the M&RP.

*page 6-3*

**6.22.2 Coal Seams, Overburden, Stratum Below Coal Seams.**

**Proposal**:

There is sufficient technical information to determine the nature, depth and thickness of the coal seams, and the thickness and extent of all formations in the area adjacent to the mine area.

**Analysis**:

The proposal as it is given in chapter 6 applies only to the original permit area included in the two federal leases. The limited amount of data referred on this page has been sufficient to characterize the relatively small area covered by these two leases, but the addition of the right-of-way and the two state leases has greatly expanded the permit area and the adjacent area and the amount of information needed for characterization.

Locations of stratigraphic sections "A" and "B" in Appendix 6-1 are shown on Plate 6-2 but this is not noted in Appendix 6-1. Section "A" shows two unidentified coal seams greater than 5 feet in thickness above the Hiawatha seam, but correlative seams on "B" are under 5 feet thick. The Blind Canyon seam isopach on Plate 6-2 shows thinning of the Blind Canyon seam between "A" and "B" and, based on the two in-mine borings, thinning to the north also. The isopach does not extend beyond the south half of lease SL 062648.

Plate 6-2 shows the isopach of the Hiawatha seam in lease SL 062648 only. No reference is made to maps (unnumbered Figures) in Chapter 5 that show Hiawatha

seam thickness, structure, and overburden thickness.

There is no isopach of the second overlying coal seam (Bear Canyon ?), although data in Appendices 6-1 and 6-5 indicate it is too thin to be economically mined within the federal leases. There are no data on this seam for the right-of-way, the state leases, and the adjacent areas.

Topography and coal seam elevation (? - not labeled) for the state leases, from which overburden thickness can be derived, are shown on Plates 5-2A and 5-2B but these maps are not referenced in this section. Neither Plate 5-2A, 5-2B, nor Plate 6-2 includes overburden thickness information for the right-of-way.

**Deficiency**:

1. Coal seams are not identified on stratigraphic sections "A" and "B".

2. There are no isopach maps of the two main overlying coal seams for the right-of-way, state leases, and adjacent areas.

3. Reference is not made to Plates 5-2A and 5-2B that provide Hiawatha seam elevation, structure, and overburden thickness information for the state leases. The data represented by the contours on Plates 5-2A and 5-2B are not identified.

4. Reference is not made to the unnumbered figures in Chapter 5 that show Hiawatha seam thickness, structure, and overburden thickness.

5. Interburden or overburden thickness for the overlying coal seams is not shown on maps or cross sections for the state leases, right-of-way, or adjacent areas.

*page 6-4*

**Proposal**:

Drilling results obtained in 1985 indicate the Blind Canyon seam is not thick enough to mine. The USGS is satisfied the upper seams are of no economic importance (refer to Appendix 6-2). Additional geologic information has been obtained from publications and other sources.

**Analysis**:

Data used to characterize the Blind Canyon seam in Chapter 6 is based on drilling

done in 1985 that appears to involve only the original permit area covering the federal leases. There are no data presented to support a conclusion that this seam is not minable in the state leases. Reference is made to Appendix 6-2 to support the USGS determination of no economic importance for the overlying coal seams, but rock and coal analysis results located there do not appear related to such a determination.

The nature of the Hiawatha coal is described using results of analyses, but there is nothing on the nature of the coal from the overlying coal seams, except for one set of sulfur analyses on page 6-8 that is not referred to here.

Additional geologic information was submitted by "Mr. Wollen", but it is unclear if this refers to measured sections in Appendix 6-1 and analyses in Appendix 6-2 or to something else. There is no information on Mr Wollen, his qualifications to provide information, or his connection to the operator.

Geologic structure maps and measured coal outcrop sections by Doelling (1972) are in Appendices 6-3 and 6-4, but copies of Doelling's Lower Coal Structure map in Appendix 6-3 and Index map in Appendix 6-4, which shows the locations of the coal sections, are poor quality and of limited use. The coal thicknesses measured by Doelling and shown in Appendix 6-4 are not incorporated into maps, cross sections, or plans as part of the M&RP.

**Deficiency:**

1. There is nothing in Appendix 6-2 to indicate the overlying coal seams are not of economic importance.

2. No information is provided to support a conclusion that overlying coal seams are not minable in the portion of the permit area covering the state leases.

3. The qualifications of Mr. Wollen, the nature of the information supplied by him, and conclusions based upon that information are not clear.

4. Data from Doelling (1972) are presented in Appendix 6-4 but do not appear to have been used in determining nature, depth, and thickness of the coal seams and overburden in the permit and adjacent areas nor to have been incorporated into the maps, cross sections, and plans of the M&RP.

**Coal Reserves**

**Deficiency:**

1. Coal reserve estimates given here for the Hiawatha seam include only reserves

in the two federal leases.

2. Coal reserves in the overlying coal seams are not estimated or discussed for areas outside the federal leases.

*page 6-5*

**Proposal**:

Coal deposit and reserve information is required by 30 CFR 211.10(c)(6)(i) which must conform with the information submitted with the mining and reclamation plan.

**Analysis**:

The reference to CFR 30 211.10(c)(6)(i) is outdated. The information on Reserve Classifications, Stratigraphy, and Structure given here could be used to augment sections R645-301-624 and R645-301-625.

Coal thickness of up to 14 feet indicated on this page is not mentioned elsewhere and does not show on Plate 6-2: the Hiawatha isopach in Chapter 5 only shows 11 feet maximum thickness. Sulfur content of the coal is given here as 0.30% to 1.00%, but as 0.3% to 0.8% on page 6-4. Dip in the region is described as 1-3 degrees to the west, but beds are shown dipping to the southeast on Plates 6-2, 5-2A, and 5-2B. Fault alignments and offsets discussed here are not mentioned in other sections of the M&RP.

**Deficiency**:

1. The reference to CFR 30 211.10(c)(6)(i) is outdated.

2. There are either minor differences between data presented here and in other parts of the M&RP, or information is given here that is not found elsewhere in the M&RP where it might be equally appropriate.

*page 6-6*

**6.22.3 Coal Outcrop / Strike and Dip**

**Deficiency**:

1. References to Plates 5-2 and 5-2C as showing outcrops and strike and dip are no longer accurate.

## 6.23 Geologic Determinations

**Proposal:**

Required information on potentially acid- and toxic-forming materials is found in Sections 6.24.32 and 6.24.33 and Appendix 6-2. Subsidence control and monitoring are discussed in Section 5.25 and Appendix 5.

**Analysis:**

DOGM does not make the determination of potentially acid- and toxic-forming characteristics; this is part of the operators responsibility in preparing the Mining and Reclamation Plan. Potentially acid- and toxic-forming materials are discussed under Sections 6.24.32 and 6.24.33 below.

Plate 6-2 is referred to as the source of overburden thickness for determining subsidence effects. Plate 6-2 does not include the right-of-way or the state leases. The overburden isopach map in Chapter 5 is not referenced; maximum thickness of overburden shown on that map is 2100 feet, not 1700 feet as stated on page 5-16.

In Section 5.25, maximum subsidence is calculated based on removal of 6 feet of coal, yet on page 5-7 it is stated that first mining will take up to 9 feet of coal where possible; it is unclear if more than 9 feet will be recovered by first mining in any part of the mine. It is also unclear if additional coal thickness beyond 9 feet may be removed during second mining. Maximum coal thickness is given as 14 feet on page 6-5 but only shown as 11 feet on the Hiawatha seam isopach in Chapter 5.

**Deficiency:**

1. Overburden thickness data used in Section 5.25 do not appear to include the state leases or right-of-way.

2. Maximum subsidence is not determined using the maximum thickness of coal that the plan states **will** be removed.

3. Maximum thickness of coal that **can or might** be removed (or is available for removal) is not clear.

## 6.24 Geologic Information

**Proposal:**

The Starpoint Sandstone is an important regional aquifer that lies below the lowest

coal seam to be mined.

The Blackhawk Formation may contain perched aquifers in lenticular sandstones, and flow of this perched water to deeper strata or to springs could be affected by drilling or subsidence from mining. Low permeability shales are bentonitic and swell when wet, tending to seal faults and fracture and to limit secondary permeability.

**Analysis**:

Regional and structural geology are discussed in Section 6.21. but there is no description in Section 6.21 or 6.24 of the effect of regional and structural geology on the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground water. The geology of Joe's Valley is not discussed. The surface water drainage divide between Joe's Valley and Huntington Canyon is one major regional feature of importance. Faults, especially those along the west side of East Mountain, and their roles as conduits or barriers to ground water movement between Joe's Valley and Huntington Canyon drainages need to be characterized.

**Deficiency**:

1. The M&RP does not show how the regional and structural geology may affect the occupance, availability, movement, quantity, and quality of potentially impacted surface and ground water.

*page 6-7*

**Proposal**:

Reference is made to Appendix 6-1 and Plate 6-2 as basis for the geological description of the area. Additional information on the regional and structural geology is found in Section 6.21.

**Deficiency**:

1. There is much more information available on maps, cross sections, and plans than is referenced here.

**6.24.3 Chemical Analysis / Lithology**
**6.24.31 Drill Hole Logs**

**Proposal**:

Drilling results and details are summarized in Appendix 6-5. Additional information on lithology and potential impacts of mining on ground water is provided in Section 6.24.

**Deficiency**:

1. More data are available than what are referenced here.

2. No information on ground waster in bore holes is presented in Appendix 6-5 nor in Section 6.24.

### 6.24.32 Chemical Analysis - Strata

**Proposal**:

Pyrite, alkalinity, and clay content information is in Appendix 6-2.

*page 6-8*

Pyrite and alkalinity of strata immediately above and below the Hiawatha seam are summarized on page 6-8.

**Analysis**:

Locations where the samples were collected are not given; the first assumption is that they are from measured sections "A" and "B". If so, they represent basically one point in the permit area.

The basis for determining acid- and toxic-forming potential of strata overlying and underlying the Hiawatha seam for the entire mine is only two samples, one floor sample (19306) that indicates marginally acceptable acid-base potential and unacceptably low paste pH and one roof sample (19305) that shows acceptable values. On the other hand, little of the floor rock has been brought from the mine in the past or probably will be brought from the mine in the future. These are two considerations to be balanced in assessing the need for further sampling and analysis to characterize the acid-forming potential of strata above and below the seams to be mined in the permit area. The sample of floor rock from the Blind Canyon seam (19308) also appears to be from potentially acid-forming material: paste pH values are too low and the acid-base potentials are just within acceptable values.

Presentation of analysis results is not clear: alkalinity values on page 6-8 appear to be reported as a range of values, but by referring to the data sheets in Appendix 6-2, it is found that the first number is paste Ph and the second is alkalinity in mg/l.

**Deficiency**:

1. Results of rocks sample analyses found in Appendix 6-2 are not summarized

clearly or adequately on page 6-8.

2. Sample locations are not identified.

3. The potential acid-forming material in the floor rock indicates further sampling and analysis may be warranted. This is not discussed.

**6.24.33 Chemical Analysis - Coal**

**Proposal**:

The sulfur and iron sulfide content of the coals are given.

**Analysis**:

Page 6-8 gives sulfur and iron sulfide content for the Hiawatha and Blind Canyon seams, but only one laboratory report for coal analysis is found in Appendix 6-2. Sampling locations are not identified on either page 6-8 or in Appendix 6-2. Sulfate, organic sulfur, and pyritic sulfur are presented on page 6-8, but the coal analysis report in Appendix 6-2 does not include a break down of total sulfur into those three forms.

Sulfur content of the coal is given on page 6-5 as 0.30% to 1.00%, and as 0.3% to 0.8% on page 6-4. The values given on page 6-8 lie within those ranges, but these various values indicate there is more coal analysis data available than is considered here or included in Appendix 6-2.

The acid-base potential determined for this coal (-11 tons $CaCO_3$/1000 tons) was based on total sulfur rather than on pyritic sulfur or pyritic plus organic sulfur, so the reported value may be unrealistically low. The reported value is too low to allow the coal to be within the root zone when the site is reclaimed; however, with the current operation plan there is only a small amount of coal temporarily stockpiled before shipping and there should not be any significant amount of coal on site to deal with at the time of reclamation. Therefore the acid-forming potential of this coal does not seem to be a problem. It is suggested, however, that any future determination of acid-base potential be done on the basis of pyritic and organic sulfur rather than total sulfur.

**Deficiency**:

1. Sample location(s) is(are) not identified.

2. Analysis results given on pages 6-4, 6-5, and 6-8 do not conform with each other and evidently are based on more than the single lab report in Appendix

6-2.

3. The M&RP does not mention the unacceptably low acid-base potential of the coal indicated by the analysis report in Appendix 6-2.

**6.24.34 Properties of Strata Above and Below Coal**

**Proposal:**

Mining is done using standard room and pillar mining operations. Stratigraphic sections in Appendix 6-1 and drilling results in Appendix 6-5 do not show any clays or soft rock above or below the Hiawatha seam.

**Analysis:**

Each mining operation should be specifically designed based on properties of the coal and the overlying and underlying strata in order to minimize dangers to the miners, minimize subsidence, and maximize coal recovery and profitability.

The absence of clay or soft rock at the outcrops and in the roof at the two drill holes does not characterize the entire permit area; three of these four sample points are within 600 feet of each other and the forth is roughly a half mile from those three. Mining in the state leases will extend 2 to 3 miles from these points and variations in roof and floor rock lithology (i.e., potential thickening of the clayey shale that is shown on Section "B" in Appendix 6-1 between the coal and Star Point Sandstone) would not be unexpected over such a distance.

Determination of properties is limited to describing rock type and color. Except for the outcrops, there are no determinations of properties for the floor rock. Information on roof and floor strata should be updated, ideally from bore holes done in advance of the mining but also from over- and undercasts, roof falls, bolt holes, etc., and, if needed, the mining operation plan should be modified.

**Deficiency:**

1. Information on roof and floor strata have been included for only a small area of the mine that does not include the right-of-way or the state leases.

**6.27 Overburden Thickness and Lithology**

**Deficiency:**

1. Current information is not referenced.

*pages 6-8 and 6-9*

| | |
|---|---|
| **6.30** | **Operation Plan** |
| **6.31** | **Casing and Sealing of Exploration Holes and Boreholes** |
| **6.31.1** | **Temporary Casing and Sealing of Drilled Holes** |
| **6.31.2** | **Permanent Casing and Sealing of Exploration Holes and Boreholes** |
| **6.40** | **Performance Standards** |
| **6.41** | **All Exploration Holes and Boreholes** |

Proposal:

Each exploration hole, borehole, well, or other exposed underground opening other than those used exclusively for blasting will be cased and sealed. Methods will include filling with cuttings or inert material until it is level with the surface. Holes that flow or have the potential to flow will be cemented, and holes that penetrate two or more aquifers with significantly different ground water quality will be cased or cemented.

Holes that remain open for use as water supply wells or ground water monitoring wells will be completed with casing or piezometers so as prevent drainage of surface water or other material into the well, will be fitted with caps, and when no longer needed will be abandoned in accordance with the measures described above.

Permanent closure methods will be designed to prevent access to the mine workings and to keep acid or other toxic drainage from entering water resources.

Analysis:

The commitment is made to case **and** seal each exploration hole, borehole, well, or other exposed underground opening other than those used exclusively for blasting. To avoid unnecessarily stringent requirements and/or to prevent confusion it should be made clear that exploration holes, boreholes, etc. that do not remain open for use as water supply wells or ground water monitoring wells will normally not be completed with casing. They may be plugged, capped, sealed, backfilled or otherwise managed to protect water resources without the use or installation of casing, but casing will be used if it is needed.

Exploration holes or boreholes are not wells according to the definition in the Division of Water Rights (DWtrR) Rules for Water Well Drillers, but monitoring wells (and wells for other uses) are under the jurisdiction of the DwtrR and are to be installed and abandoned according to DWtrR Rules. The procedures outlined in the M&RP generally appear to meet the requirements of DWtrR rules, but use of a licensed driller is not mentioned for installation and abandonment of wells. Use of a licensed driller should avert potential problems.

**Deficiency**:

1. The conditions in which casing will or will not be used need to be clarified.

2. There is no commitment that installation and abandonment of monitoring wells (and other wells) will be done by a licensed driller following Division of Water Rights rules and procedures.

## Check for Clarity

*page 6-3* - *second sentence in second paragraph, beginning "The maps submitted..."*
- *second sentence in last paragraph, beginning "These geologic..."*

*page 6-5* - *first sentence in fifth paragraph, beginning "An accurate..."*

**R645-301-700 Hydrology**

Language in Chapter 7 indicates that this chapter has not been adequately updated to include the state leases or the right-of-way. Because of this, the following review does not contain detailed, separate **Proposal** or **Analysis** sections to accompany many of the deficiencies, as the deficiencies derive mainly from this overall failure to update.

Chapter 7 has been organized and divided to closely follow the format of the current State Regulations.

**7.22 Cross Sections, Maps, and Plans**

*page 7-2*

**Proposal**:

Figures 7-1 through 7-20 depict all existing surface and ground water occurrences within and adjacent to the permit area. These maps show the topography, streams, wells. water monitoring locations, and other hydrologic design information.

**Analysis**:

Figures 7-1, 7-4, and 7-20 do not include the entire permit area, leaving out geology, monitoring well locations, and stream monitoring stations on and adjacent to the state leases. Seep and spring identifications and surface elevation contours are not legible on Figure 7-3.

There is no title or identification on Figures 7-2 and 7-2a.

**Deficiency**:

1. Geology, monitoring well locations, and stream monitoring stations are not shown for the entire permit area on the referenced figures.

2. Most of Figure 7-3 is illegible. Lease numbers and boundaries are not clear on Figure 7-7.

3. Titles/explanations for Figures 7-2, 7-2A, 7-4, 7-8a, and 7-20 are missing or obscured. (Figure 7-8b is the wrong map.)

**7.24 Baseline Information**
**7.24.1 Groundwater Information**

**Proposal**:

The leases (under **Scope**) and area of the seep and spring survey (under **Methodology**) are on Figure 7-1.

**Analysis/Deficiency**:

1. Figure 7-1 does not show all the area or the information described in these two statements.

*page 7-3*

**Proposal**:

Locations of seeps and springs monitored in 1985, 1987, 1989, and 1990 are shown on Figure 7-3.

**Analysis/Deficiency**:

2. Locations of the seeps and springs monitored in the 1985 surveys are shown on Figures 7-2 and 7-2a, but are not all are on Figure 7-3 as stated on page 7-3 and in the title block of Figure 7-3. Figure 7-3 does not show any of the springs found in 1985 in Sections 4 and 5, T. 16 S., R. 7 E. and Section 32, T. 15 S., R. 7 E. There may be additional springs in other sections but identification of the springs is difficult due to poor copy quality.

*page 7-6*

**Proposal**:

Results of the seep and spring surveys **(Mine Plan Aquifers)** were submitted previously to DOGM (EarthFax Engineering, 1985a and 1985b).

**Analysis/Deficiency**:

3. The EarthFax Engineering, (1985a and 1985b) references are not listed in the References section.

*pages 7-24 through 7-28*

**Proposal**:

Specific information on the potentiometric surface in the Star Point Sandstone is not available because there is only one monitoring well.

Water in the Star Point Sandstone beneath the mine does not flow south to Crandall Creek, based on the observation that the floor of the mine is lower than the stream in approximately one-third of the mine, but no water flows into the mine through the floor.

The direction of ground water flow within the Star Point Sandstone beneath the mine is considered to be predominantly eastward.

**Analysis**:

Regional dip is to the west, but several maps in the M&RP (Figure 5-8, Plates 5-2a and 5-2b) show local dip is to the southeast. This supports the concept of ground water flow to the east and eliminates the need for an argument supporting ground water flow against dip.

Descriptions of or references to the potentiometric surface, here and in other places such as page 7-36, do not include information from the two wells drilled in 1991-92.

**Deficiency**:

4. The potentiometric surface map, Figure 7-8a, and related text need to be updated (additional comments below).

5. Local dip, in addition to regional dip, should be considered in predicting direction of ground water flow.

*page 7-29*

**Proposal**:

Specific conductance, pH, temperature, and flow are given in Table 7-1 and discussed on this page.

**Analysis/Deficiency**:

6. There are no analyses of total iron or manganese as required by R645-301-724.100.

*page 7-36*

**Analysis/Deficiency**:

7. The last line on this page contains an incomplete reference: Figure 7-??.

*page 7-38*

**Proposal**:

Figure 7-8a is a potentiometric map of the Blackhawk-Starpoint aquifer and Figure 7-8b is a structure map on top of the Blackhawk Formation.

**Analysis/Deficiency**:

8. Both Figures are the same, showing the potentiometric surface; also, because of poor copy quality the explanation blocks and titles are unclear and difficult to read.

*page 7-41*

**Proposal**:

Two in-mine ground water monitoring wells will be installed in lease ML-21569 to evaluate the potentiometric surface of the Blackhawk-Starpoint aquifer.

**Analysis:**

This entire section needs the data from the two new wells to be incorporated and the discussion and conclusions updated.

**Deficiency:**

9. The two in-mine wells have been installed but potentiometric data from them have not been used to update this section of the M&RP.

### 7.24.2 Surface Water Information

**Proposal:**

Discussion of surface water conditions in and adjacent to leases SL062648 and U 054762 are presented in this section.

**Analysis/Deficiency:**

1. The entire permit area needs to be discussed.

**Proposal:**

Stream Channels crossing the permit area are ephemeral in nature, with no streamflow data being available.

**Analysis:**

Crandall and Indian Creeks are perennial; Blind Canyon and Horse Canyon are perennial for part of their length, including reaches within and adjacent to the permit area. The United States Forest Service (USFS) feels there is evidence of perennial flow from the west slopes of East Mountain. Streams adjacent to the permit area need to be considered also. The determination of the PHC in Appendix 7-15 is based on the incorrect conclusion that the watersheds are ephemeral. The statement that streams are ephemeral is repeated near the bottom of page 7-42.

Baseline information on surface water is to be provided by the permittee as part of the permit application. Determination of the PHC is based largely on this information. Baseline surface water quantity information includes , at a minimum, information on seasonal flow rates. Baseline quality information includes, at a minimum, suspended solids, total dissolved solids or specific conductance corrected to 25° C, pH, total iron, and total manganese. Baseline data were collected for Crandall Creek between June 1983 and November 1985

(page 7-46 and Table 7-5a).

**Deficiency**:

3. Characterization of watersheds within and adjacent to the permit area as ephemeral is inaccurate (on page 7-42 also).

4. It is the permittee's responsibility to provide minimum information on surface water quantity and quality, for areas within and adjacent to the permit area. This also affects the determination of the PHC in Appendix 7-15.

*page 7-42*

**Proposal**:

Water quality and quantity of Crandall Creek and Huntington Creek are characterized.

**Analysis/Deficiency**:

5. Horse Creek, Blind Creek, Indian Creek, and surface drainage from the west side of East Mountain into in Joes Valley are not covered.

*page 7-46*

**Proposal**:

Water quality data for Crandall Creek are discussed in the M&RP.

**Analysis/Deficiency**:

6. Surface water quality and quantity data for Blind Creek, Horse Creek, Indian Creek, and the east slope of West Mountain are not characterized.

*page 7-55*

**7.24.3 Geologic Information**

**Proposal**:

Sufficient geologic information is provided in Chapter 3 (sic) and in Sections 7.24.1

and 7.24.2.

**Analysis/Deficiency**:

1. The reference should be to Chapter 6. There are several deficiencies in the geologic information in that chapter, in particular for the areas within and adjacent to the state leases.

*page 7-56*

**7.24.5 Supplemental Information**

**Proposal**:

It is not anticipated that any additional information will be required by the PHC, since this is an approved permit.

**Analysis**:

The previous permit and subsequent permit modification were approved subject to several stipulations, from the Forest Service and from DOGM, that have direct bearing on the determination of the PHC. Many of these stipulations still have not been satisfied. Supplemental information based on drilling, aquifer tests, hydrogeologic analysis of the water bearing strata, flood flows, or analysis of other water quality or quantity characteristics will most likely be required to satisfy these stipulations.

**Deficiency**:

1. Additional information may be required to meet outstanding stipulations.

**Proposal**:

If it is proven that mining activities have reduced the flow of any seep or spring in the area by 50% or more, Genwal will notify the Department of Wildlife Resources, the U.S. Forest Service, and the Division of Oil, Gas, and Mining and begin working on an acceptable mitigation plan involving the use of guzzlers.

**Analysis/Deficiency**:

2. The Utah Division of State Lands and Forestry, managing agency for the state leases, should also be conferred with in formulating any mitigation plans that will affect those lands.

*page 7-57*

**7.28 Probable Hydrologic Consequences Determination**

**Proposal**:

The PHC is in Appendix 7-15.

*page 2 of the PHC (Appendix 7-15)*

**Analysis**:

Under *R645-301-728.300 Findings* in the PHC it states that Sections 7.24.1 and 7.24.2 in Chapter 7 contain determinations that the potential for adverse impacts to the hydrologic balance are minimal. Section 7.24.1 contains such determinations for ground water on pages 7-36 through 7-41, although: 1) the relationship between the ground water systems under Joes Valley and East Mountain has not been established and the potential impacts of the proposed mining on ground water in Joes Valley are not covered; 2) potentiometric data have not been updated using the two new in-mine wells; and 3) the discussions of estimated mine inflow rates and of the comparison of calculated to actual inflow rates have not been updated using current potentiometric data.

Section 7.24.2 describes the permit area as being drained entirely by ephemeral watersheds, and the determination of the PHC appears to be determined on that basis.

**Deficiency**:

1. The findings on whether adverse impacts will occur to the hydrologic balance are based on incomplete evaluations of the hydrologic systems.

**Analysis**:

Section 7.28.320 states that acid- and toxic-forming materials are not known to exist at this site; however a plan has been developed to protect surface and ground water in the event such materials are encountered. The plan is detailed in Section 7.31.3.

The determination of acid- and toxic-forming potential of strata overlying and underlying the Hiawatha seam is based only two samples, one floor sample (19306) that indicates marginally acceptable acid-base potential and unacceptably low pH (paste pH) and one roof sample (19305) that shows acceptable values. There is no plan for additional sampling.

The plan to control acid and toxic drainage in Section 7.31.3. is 1) to identify and bury and/or treat, when necessary, materials that may adversely affect water quality, or be detrimental to vegetation or public health and safety if not properly buried and/or treated; and 2) storing materials in a manner that will protect surface and ground water.

There is no site identified in the M&RP for storage, burial, or treatment of waste rock. However little, if any, roof or floor rock has been brought from the mine in the past or probably will be brought from the mine in the future.

**Deficiency**:

2. The determination of no acid- and toxic-forming materials is based on only two sample analyses, one of which shows only marginally acceptable values.

3. No method or plan is given for identifying materials that could result in the contamination of surface or ground water supplies, and the plan for dealing with such material, if identified, is vague.

*page 3 of the PHC (Appendix 7-15)*

**Analysis**:

Under 728.332 the statements are again repeated that the entire permit area is drained by ephemeral watersheds and no acid- or toxic-forming materials are known to be present.

**Deficiency**:

4. Streams within and adjacent to the permit area are not all ephemeral.

5. The determination of no acid- and toxic-forming materials is based on only two sample analyses, one of which shows only marginally acceptable values.

**7.30 Operations Plan**

*pages 7-58 - 7-59*

**7.31.21 Ground Water Monitoring Plan**

**Analysis/Deficiency**:

1. The zone of potential subsidence is mentioned several times on these pages,

but in a context that does not clearly incorporate the state leases as areas of potential subsidence.

**Proposal:**

Ground water monitoring will include collection of water quality and quantity data from eight springs. SP 2-24, SP 2-9, and SP-47a were chosen because of the water rights ( 93-1406, 93-1404, and 93-1407) filed on them by the USFS. Ground water rights are listed in Table 7-3 and Appendix 7-1 and shown on Figure 7-7. Seep and spring locations are on Figures 7-2a, 7-2b, and 7-3. Tables 7-4 and 7-5 list the parameters for which baseline and operational monitoring are done. Ground water quality and quantity information is in Appendices 7-16 through 7-20.

**Analysis:**

A permit application is to include baseline information for the permit and adjacent areas on the location and ownership of existing wells, springs and other ground-water resources, seasonal quality and quantity of ground water, and usage. Water quality descriptions for baseline information are to include, at a minimum, total dissolved solids or specific conductance corrected to 25 degrees C, pH, total iron and total manganese. Ground-water quantity descriptions are to include, at a minimum, approximate rates of discharge or usage (see R645-301-724.100).

In Table 4 of DOGM's *Guidelines for Establishment of Surface and Ground Water Monitoring Programs for Coal Mining and Reclamation Operations (1986)* it is recommended that ground water be sampled at least four times yearly for two years at fixed monthly intervals to establish baseline information; however, snow accumulation and weather conditions at Genwal's permit area will usually make sampling of seeps and springs in the permit and adjacent areas unreasonable during at least one quarter.

Seeps and springs, including those on the west flank of East Mountain that flow to Upper Joe's Valley, have been monitored for usage, flow, temperature, Ph, and specific conductivity on an irregular schedule from July of 1987 to Oct/Nov 1990. Monitoring results are in Appendices 7-16 to 7-20. Specific conductivity, flow, and temperature data (no pH) for 1991 have been supplied to DOGM and the USFS as Appendix 8 of the LBA data adequacy package, but those data have not been incorporated into the revised M&RP.

Water rights have been claimed by the USFS on ground water from springs on lands surrounding the permit area. The USFS has claimed numerous water rights on springs in Upper Joes Valley, immediately west of the permit area. At least part of the water discharged by the Joes Valley springs has been characterized as coming from East Mountain (page 7-9). The USFS also holds surface water rights within and adjacent to the state leases. The USFS has expressed concern that the monitoring plan is not adequate to characterize the

ground water system or to monitor effects of mining on water resources contributing to surface and ground water flow on Forest Service lands

There is no commitment for continued operational monitoring of springs within lease ML-21568 or in Joes Valley. The only spring selected for operational monitoring in the state leases is SP 1-19, an intermittent spring barely within the area of potential subsidence for lease ML-21569, in an area where minimal subsidence effects would be expected. There are no water rights filed on other springs within the state leases, but impacts to these springs could affect surface water in the Crandall and Blind Canyon drainages. In addition, use of these springs by wildlife could be greatly affected.

A commitment is made on page 7-41 and again on page 7-57 that when flows are reduced by 50% or more as a result of mining activities, alternate water supplies will be developed. While monitoring of every spring and seep may not be practical, there must be enough monitoring to detect impacts from mining, otherwise the commitment to mitigate is meaningless.

**Deficiency**:

1. Ground water sampling and analysis results in Appendices 7-16 through 7-20 are neither consistent enough nor frequent enough to establish a baseline if DOGM's *Guidelines* document is followed. No reasoning for the frequency and timing of the actual sampling is given to justify variance from the *Guidelines*.

2. Analysis results for total iron and manganese in ground water samples are not included in Appendices 7-16 through 7-20 nor in the LBA data submitted to DOGM.

3. The data from 1991 in the LBA documents is not included in this revised M&RP. Values of pH are not found in LBA data for 1991.

4. Additional intermittent and perennial springs, in areas within the state leases likely to be affected by subsidence and in Joes Valley, need to be included in the operational monitoring.

5. Figure 7-8 is referred to in the first paragraph of page 7-59 for locations of springs, but springs are not shown on Figure 7-8.

6. The eight springs to be monitored are not all on Figure 7-2 as stated in the second paragraph on page 7-59.

7. On page 7-59, spring SP-47 is identified as one of the eight springs to be

monitored for ground water monitoring, but on page 7-63 is an explanation of why SP-47a is being monitored instead. The information on page 7-59 needs to be updated to describe the actual monitoring plan.

8. SP-19 and SP-22 referred to on page 7-59 are labeled SP-1-19 and SP-1-22 on Figure 7-3. Names or labels should be consistent throughout the M&RP.

9. The USFS claims to hold water right 694, which is associated with what the USFS describes as an important spring located on the east edge of Section 2, T. 16 S., R. 7 E. Information on this water right claim is not in Appendix 7-1 and there is no spring shown at that location on Figures 7-2a, 7-2b, or 7-3. The USFS and Utah Division of Water Rights should be contacted to clarify the existence and/or location of this spring.

10. Following reclamation, samples will be collected semiannually. It is not clear that one of these will be collected during low flow, which is usually the forth quarter.

*page 7-60*

**Analysis**:

Commitment is made to preserve samples following the most recent U.S. EPA guidelines. A commitment is made on page 7-2 to collect and analyze samples according to the methodology in the current edition of *"Standard Methods for the Examination of Water and Wastewater"* or the methodology in 40CFR Parts 136 and 434, which conforms to wording in the Coal Mining Rules.

**Deficiency**:

11. The language on page 7-60 (and 7-64 also) should be clarified to correspond with the commitment on page 7-2 to collected and analyze water samples according to the methodology in the current edition of *"Standard Methods for the Examination of Water and Wastewater"* or the methodology in 40CFR Parts 136 and 434.

*page 7-63*

12. Spring 47a (Water Right SP-1407), which is being monitored, is not on Figures 7-2 or 7-2a and the poor quality of Figure 7-3 makes its identification unsure.

13. The discussion of in-mine wells does not include the two new wells, MW-4 and MW-5. Figure 7-4 needs to be updated. For clarity, the location of MW-3 should also be given along with an explanation of why it is no longer accessible for monitoring.

*page 7-64*

**7.31.22 Surface Water Monitoring**

1. The locations of the two Crandall Creek flumes are on Figure 7-20. The location of the Blind Creek flume is not shown.

2. Following reclamation, surface water samples will be collected semiannually. It is not clear that these will be during high and low flow for perennial streams.

*page 7-65*

3. Locations of the stream monitoring points along Blind and Horse Creeks and the north and south forks of upper Crandall Creek are referenced to Plate 5-2a but not 5-2b.

4. Monitoring of Blind and Horse Creeks and the north and south forks of upper Crandall Creek has been done. The data need to evaluated and the results incorporated into the M&RP.

5. The flume in Joes Valley is not discussed or shown on a map.

6. There is no commitment to remove flumes and other monitoring devices when no longer needed.

**7.31.3 Acid and Toxic Forming Materials**

1. No method or plan is given for identifying materials that could result in the contamination of surface or ground water supplies, and the plan for dealing with such material, if identified, is vague.

**7.38 Temporary Casing and Sealing of Wells**

1. The portion of the statement dealing with surface mining is superfluous.

2. Figure 7-5 shows an open well with 6 5/8" diameter surface casing. Neither the text nor Figure 7-5 indicates how the wells are to be temporarily sealed to exclude drainage or control flow and to protect mine personnel.

## Check for Clarity

*page 7-8* - *middle of last paragraph, "contract" or "contrast"?*

- *last sentence on the page; "test", is it east or west?*

*page 7-9* - *"contracting" or "contrasting" in last sentence?*

**R645-301-731.300 Acid- and Toxic-Forming Materials.**

**Proposal**:

Testing of toxic material below the coal stockpile is referred to on page 2-9 of the MRP.

**Analysis**:

Details of testing are not included in the MRP or in Appendix 5-20 with the bonding cost estimates. How many samples will be taken and to what depth? The Division recommends that depth segregated samples are drawn from three locations within the coal stockpile area. The samples should be segregated as follows: 0-6", 6-12", 12-24", and 24-36". Samples from corresponding depths from each of the sampling locations can be mixed and a subsample drawn for analysis. This will result in 4 samples sent for analysis. Analytical parameters suggested for analysis are found in Table 6 of the Division's 1988 "Guidelines for Management of Topsoil and Overburden," Due to the coal stockpile storage at the site, molybdenum and arsenic might be added to the list of parameters.

**Deficiency**:

1. Details of the number of samples to be tested and the analyses to be performed should be included in the discussion on page 2-9, Chapter 2, of the acid/toxic testing procedures to be conducted in the vicinity of the present coal stockpile. These tests should be included in the cost estimates found in Appendix 5-20.

**R645-301-830 Determination of Bond Amount**

**Proposal**:

The Applicant has provided the Division with a cost estimate for reclamation work in Appendix 5-20.

**Analysis**:

The cost estimate does not list all the building, structures, and pavement that must be demolished and removed. There were no estimates for hauling the waste material off site or disposing of it on site.

The Applicant used the Means Cost Estimating book to determine the earthwork costs. The Applicant did not supply the Division with the productivity studies that show assumption made in Means are valid for the mine site.

The earthwork proposed by the Applicant does not meet the regulations governing restoration of the approximate original contours.

**Deficiencies**:

1. The Applicant must determine the demolition and removal cost for all structures, equipment, and pavements.

2. The Applicant must determine the cost of disposing of all waste material generated during the demolition process. The material can either be disposed of on site if regulations permit or in an approved landfill.

3. The Applicant will provide productivity studies that verify that the assumption made in the Means Cost Estimating book are valid for the mine site.

4. All earthwork computations must be must be based on restoring the area to the approximate original contours until such time that the Applicant receives a variance from those requirements.