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January 7, 200~~1~~2

TO: Internal File

FROM: Gregg H. Galecki, Reclamation Specialist/Geohydrologist & Team Lead ~~AA~~

RE: Whitmore Canyon Exstension, West Ridge Resources Inc. West Ridge Mine, C/007/041-PM01H

**SUMMARY:**

On October 24, 2001, the Division received a proposal to add Federal Lease UTU-78562 to the permit area for the West Ridge Mine. The proposal was determined to be Administratively Complete on December 12, 2001. Upon the Administratively Complete determination a technical review commenced. The following is a technical review of the Geologic and Hydrologic portions of the proposal. There are several deficiencies that need to be addressed prior to approval.

**TECHNICAL ANAYLSIS:**

**GENERAL CONTENTS**

**COMPLETENESS**

Regulatory Reference: 30 CFR 777.15; R645-301-150.

**Analysis:**

The following examples are areas where lines or sentences were omitted during transfer from the current proposal and insertion into the approved MRP, or typographic errors:

- Missing a line from bottom of pg. 7-17 to top of 7-18.
- Missing first two sentences of 724.412 (pg. 7-8 to 7-9)

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- Pg. 7-19, 731.200, 3<sup>rd</sup> line, Tables 7-1 through 7-6
- Chapter 6, Pg. 6-1, Regional Geologic Description, states dip is N to NW.

**Findings:**

Information provided in the proposal is not adequate to meet the requirements of the General Contents – Completeness section of the regulations. Prior to final approval, the applicant must supply the following in accordance with:

**R645-300-133.100**, Make the requisite changes as outlined above.

## **ENVIRONMENTAL RESOURCE INFORMATION**

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

### **ALLUVIAL VALLEY FLOORS**

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

**Analysis:**

**Alluvial valley floor determination**

Addition information is requested to supplement the information available in Chapter 2 of the approved MRP. To make the Alluvial Valley Floor determination for lands affected by the proposed mining in Whitmore Canyon and the Grassy Trail Creek drainage one to two maps are requested: 1) a regional geologic map identifying, at a minimum, the geology through the permit area to the City of Dragerton, and 2) a map or discussion of the land uses of the valley floor, specifically Grassy Trail Creek and its uses in the Dragerton/East Carbon area.

**Findings:**

Information provided in the proposal is not adequate to meet the requirements of the Environmental Resource Information – Alluvial Valley Floors section of the regulations. Prior to final approval, the applicant must supply the following in accordance with:

**R645-302-320**, provide 1) a regional geologic map identifying, at a minimum, the geology through the permit area to the City of Dragerton, and 2) a map or discussion of the land uses of the valley floor.

## **GEOLOGIC RESOURCE INFORMATION**

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

### **Analysis:**

The geologic coverage of the area is already sufficiently addressed in the current MRP. Maps 6-1, 6-2, and 6-3 (Regional Geology, Coal Seam Structure, and Lower Sunnyside Coal seam, respectively) were resubmitted to illustrate the addition of Federal Lease UTU-78562. No additional changes were made to the above-referenced maps.

### **Findings:**

Information provided in the proposal is adequate to meet the requirements of the Geologic Resource Information section of the regulations.

## **HYDROLOGIC RESOURCE INFORMATION**

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

### **Analysis:**

#### **Sampling and Analysis**

The sampling and analysis as outlined in the current plan is adequate for the current proposal.

#### **Baseline Information**

Adequate baseline information has been submitted to characterize the Whitmore Canyon drainage basin. Streams ST-3 and ST-8 have been sampled on a quarterly basis since May 1997. Springs SP-12, SP-13, SP-16 have been sampled on a quarterly basis since May 1997 to characterize the impacts to Colton and North Horn formations in Whitmore Canyon, respectively. Springs WR-1 and WR-2 have been sampled on a quarterly basis since June 1999 to characterize impacts to the Colton Formation on West Ridge. The addition of Stream sites ST-9 and ST-10 and Spring S-80 will be initiated in Grassy Trail Creek and Hanging Rock Spring to further characterize the potential impacts to the area.

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**Ground-water Information**

Groundwater is currently being monitored in the Blackhawk Formation at DH 86-2 and previously at DH 86-1. The adjacent Sunnyside mine was making appreciable water in the area of Whitmore Canyon. The proposed lease is down-dip of DH 86-2 and along strike of the Sunnyside mine workings, which illustrates a potential for appreciable groundwater to exist. Unfortunately, none of the exploration drill holes documented whether groundwater was encountered, so an important source of information is not available. If appreciable water is encountered, it will be handled in a fashion similar to water encountered at the Sunnyside Mines.

**Surface Water Information**

The surface water information as outlined in the current plan (Mayo and Associates, 1997, appendix 7-1) is adequate for the current proposal.

**Baseline Cumulative Impact area Information**

The information provided in the Mayo and Associate reports (1998, 2001 respectively) adequately characterize the area, with the exception of possibly better characterizing a groundwater elevation, as cited above.

**Modeling**

No numerical models have been created for the area.

**Alternative Water Source Information**

The determination, by the applicant, of the probable hydrologic consequences indicates that the proposed coal mining activities will not result in the contamination, diminution, or interruption of groundwater or surface-water sources within the proposed or adjacent areas. Any water that will be produced/discharged from the mine will potentially have beneficial use to wildlife and irrigation of agricultural fields; similar uses were developed at the Sunnyside Mine when water was discharging from that mine.

**Probable Hydrologic Consequences Determination**

The analysis of the probable hydrologic consequences (PHC), conducted by the permittee, concluded that it is highly unlikely mining will result in the permanent decrease of surface or groundwater discharge rates in the area surrounding Grassy Trail Creek. The stream channel is underlain by approximately 2,000 feet of cover, which includes the entire thickness of the North Horn Formation. The North Horn Formation is known to form an aquaclude, an effective barrier to vertical groundwater migration. The combination of extensive cover and the malleable nature of the North Horn Formation, inhibit any detrimental affects to the surface

water flows and groundwater flows emanating from the Colton or North Horn Formations due to subsidence. Any differential subsidence of the channel should only have a temporary localized effect on sediment yield due to the nature of steep mountain streams flowing on alluvial or soft bedrock sediments.

Impacts to important water quality parameters should be minimal. Any water discharged from the mine will flow into the ephemeral C Canyon drainage, which is approximately 10 miles from the confluence of Grassy Trail Creek, the first perennial stream. It is unlikely any flow will from the mine will enter Grassy Trail Creek based on the general aridity of the region and the permeable nature of the alluvial sediments. Based on water quality from the neighboring Sunnyside Mines, the chemistry of the water is anticipated to be similar to waters that have been in contact with the Mancos Shale.

**Findings:**

Information provided in the proposal is adequate to meet the requirements of the Environmental Resource Information – Hydrologic Resource Information section of the regulations.

**MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION**

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

**Analysis:**

**Affected Area Boundary Maps**

The proposed addition of Federal Lease UTU-78562 changes the permit boundary on all maps showing the permit area. All relevant maps have been modified to reflect this change.

**Subsurface Water Resource Maps**

Both within the Geologic and Hydrologic sections (the stratigraphy and subsurface resource maps) groundwater systems have not been mapped due to the 'limited areal and vertical extent of the heterogeneous lithology of the rock units containing and overlying the coal-bearing strata'. Illustrate the 'heterogeneous lithology' in cross-section using exploration drill logs in Whitmore Canyon (i.e. holes N-17, B-8, B-7, H-16, H-31).

**Findings:**

Information provided in the proposal is not adequate to meet the requirements of the Environmental Resource Information – Maps, Plans, and Cross Sections of Resource

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Information section of the regulations. Prior to final approval, the applicant must supply the following in accordance with:

**R645-301-624**, Illustrate the 'heterogeneous lithology' in cross-section using exploration drill logs in Whitmore Canyon (i.e. holes N-17, B-8, B-7, H-16, H-31).

## **OPERATION PLAN**

### **HYDROLOGIC INFORMATION**

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

#### **Analysis:**

##### **General**

Topics covered below are the only items that required modification or additional review from the currently approved MRP. No additional surface facilities are being constructed, and no modification to the disturbed area impacts is anticipated.

##### **Ground-water monitoring**

Spring S-80 (Hanging Rock Spring), located in Hanging Rock Spring Canyon, will be added to the Operational Water Monitoring Plan to further characterize the potential impacts to the area.

Page 7-22 (Wells) and Table 7-1 need clarification on the following items. Well DH86-2 is identified as collecting water level only, when in reality both field parameters and water quality analysis is conducted.

##### **Surface-water monitoring**

Stream sites ST-10 and ST-9, located at the upper permit boundary and the inlet of Grassy Trail Reservoir, respectively, will be added to the Operational Water Monitoring Plan to further characterize the potential impacts to Grassy Trail Creek

Page 7-21 and Table 7-5 describe Operational Surface Water monitoring locations. Sites ST-5, ST-6A, ST-6 and ST-7 have crest gauges installed, and the channel dimensions in these

locations have been surveyed. A calculated flow, based on the crest gauge measurement and channel configuration, needs to be included in the water monitoring data.

### **Acid and toxic-forming materials**

Within the 1998 Mayo and Associates report, the report illustrates no Acid or toxic-forming waters will be produced or discharged from the mine. This was demonstrated with the use of in-mine waters from the Sunnyside mine and various surface waters in the area. Acid mine drainage is generally not a concern based on the abundant carbonate mineral in the coal-bearing stratum and the relatively low sulfur concentration within the coal. The dissolution of carbonate minerals quickly consumes any acid produced from the oxidation of pyrite.

### **Gravity discharges**

The strike and dip of the coal seam is toward the workings and away from any and all portals. No Gravity discharges are anticipated.

### **Water quality standards and effluent limitations**

No changes or modifications are necessary to the currently approved permit.

### **Findings:**

Information provided in the proposal is not adequate to meet the requirements of the Operational Plan – Hydrologic Information section of the regulations. Prior to final approval, the applicant must supply the following in accordance with:

**R645-301-731.200**, correctly identify the parameters being monitored at Well DH86-2. Also, provide calculated flow measurements at sites where crest gauges are installed.

## **RECLAMATION PLAN**

### **GENERAL REQUIREMENTS**

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

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## HYDROLOGIC INFORMATION

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

### Analysis:

#### General

No additional surface facilities are being constructed, and no modification to the disturbed area impacts is anticipated. No modifications are necessary to the Reclamation Plan – Hydrologic Information based on the current proposal of adding Federal Lease UTU-78562.

### Findings:

Information provided in the proposal is adequate to meet the requirements of the Reclamation Plan – Hydrologic Information section of the regulations.

## OPERATIONS IN ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR Sec. 822; R645-302-324.

### Analysis:

#### Essential Hydrologic Functions

It is highly unlikely mining will result in permanent damage to the Essential Hydrologic Functions of surface or groundwater discharge rates in the area surrounding Grassy Trail Creek. No surface disturbance will take place. Any detrimental affects caused by subsidence should only have a temporary localized effect on sediment yield due to the nature of steep mountain streams flowing on alluvial or soft bedrock sediments.

### Findings:

Information provided in the proposal is adequate to meet the requirements of the Reclamation Plan – Operations in Alluvial Valley Floors section of the regulations.

## CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

The Division has provided an assessment of the probable cumulative hydrologic impacts (CHIA) of the proposed operation, and all anticipated mining, upon surface- and ground-water systems in the cumulative impact area. The CHIA is sufficient to determine, for purposes of permit approval, whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The Division used data and analyses from several sources, including those submitted by the Permittee in the original West Ridge permit and information gathered at the Sunnyside Mines.

### **RECCOMENDATIONS:**

The application should not be approved until the deficiencies discussed in this memorandum have been adequately addressed.