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TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

September 6, 2012

TO: Internal File

THRU: Steve Christensen, Permit Supervisor *SKC*

FROM: April A. Abate, Environmental Scientist III/Lead and Hydrologist *AAA 10-9-2012*

RE: Phase III Bond Release Application, Castle Gate Holding Company, Castle Gate Mine, C/007/0004, Task ID #4153

SUMMARY:

The Permittee has submitted a package applying for Phase III Bond Release on a total of 57.44 acres of land in the Sowbelly Gulch and Hardscrabble canyons of the Castle Gate permit area. This is broken down into the areas as follows:

38.28 acres - Hardscrabble Canyon
19.16 acres - Sowbelly Gulch Canyon

This application excludes a 0.72-acre reclaimed substation area in Hardscrabble Canyon, a 1.84-acre reclaimed substation in Sowbelly Gulch and a 3-acre area known as Addit #1. Upon approval of this Phase III application, 5.56 acres will remain in the permit area. Currently, a performance bond in the amount of 490,100 is being held to ensure reclamation is accomplished. With the approval of Phase III bond release on these areas, a total of \$263,500 will be released to the Permittee.

The information provided in the Earth Fax Engineering study provides further evidence that suspended solids sediments are not contributing pollution to receiving drainages. All hydrologic reclamation work completed to date appears to be within the guidelines of Phase III Bond Release criteria. Sediment from the reclaimed areas is not impacting any downstream areas. Surface water leaving the reclaimed areas is suitable for supporting the post mining land uses. Based on an impact analysis from the material damage criteria set forth in the CHIA, onsite impacts to the permit area have been minimized and offsite impacts have been prevented. Surface water quality monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan consistent with R645.301-731.224.1 and -224.2.

RECOMMENDATIONS:

Phase III Bond Release approval is recommended on all areas applied for in this application.

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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.

The application package contains a summary of the reclamation history of the permit area, vegetation monitoring studies performed in 2004 and 2005 for Sowbelly Gulch, vegetation monitoring studies performed in 2008 and 2009 for Hardscrabble Canyon, sediment yield calculations performed for all areas included in the Phase III application, a public notice, landowner and government agency notification letter including the Section, Township and Ranges locations of the areas included in the Phase III application, and a bond reduction calculation worksheet.

Findings:

The Permittee has provided sufficient information for the Division to conduct a Phase III bond release review.

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:

Hydrologic Reclamation Plan

The Permittee provided sediment yield calculations for each of the respective areas applied for in the Phase III application. The report was prepared by Earth Fax Engineering using the universal soil loss equation (RUSLE) using both the pre-disturbance and post-reclamation scenarios. The factors take into account rainfall runoff, soil erodibility, length of slope, cover management, and support practice.

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The Permittee included in the Phase III Bond Release application Sediment Yield calculations for both canyons. The sediment yield calculations were analyzed by Earth Fax Engineering of Midvale, Utah under the direction of Utah Professional Engineer, Richard White PE No. 168246. Based on the report summary, both canyons displayed less sediment yields under the current reclaimed conditions in both canyons than the sediment yields from the canyons under the pre-mining conditions.

	Pre-Disturbance Condition	Post-Reclamation Condition
Sowbelly Gulch Canyon	0.78 tons/acre/year	0.70 tons/acre/year
Hardscrabble Canyon	0.06 tons/acre/year	0.02 tons/acre/year

In each of these areas, sediment yields were calculated to be less under the post-reclamation scenario than the pre-mining disturbance scenario. This is due to the reclamation earthwork completed, such as pocking providing for better erosion control than how the land would behave if it were still under non-disturbed conditions.

Hydrologic Balance Protection

Both Hardscrabble and Sowbelly Gulch canyons each have a principle ephemeral drainage channel in each canyon. There are a total of four active water monitoring locations within the Castle Gate permit area: two points located above and below the reclaimed disturbance areas of both canyons. Historically, although a quarterly water monitoring program has been in place as part of the conditions of the permit, there has not been any documented presence of water in Sowbelly Gulch based on historical data set dating back to 1996 on file with the Division. Hardscrabble canyon did not have any flow data in the historical data set dating back to 1977. The exception was some flow data reported at the sampling point below the mine in the late 1970s, early 1980s with flows ranging from 2.24 to 44 gallons per minute.

The Willow Creek and Adjacent Areas Cumulative Hydrologic Impact Assessment (CHIA), Rev. 1996, which covers the Castle Gate permit, outlines the criteria for Material Damage as follows:

- a. Increased Sediment Yield
- b. Flooding or Stream Flow Alteration
- c. Water Quality

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- d. Subsidence Damage to Springs and Seeps
- e. Alteration or Destruction of Fisheries and Aquatic Habitat
- f. Loss of Ground Water or Surface Water Availability

In the case of added sediment yield, all areas within the permit have been reclaimed and have gone through the applicable liability period for meeting the required vegetation standards. As such, none of the former disturbance areas have been documented to be the cause of excessive sediment leaving the permit area. The only exception is the road that is to be left in place in Hardscrabble Canyon, which is to facilitate access to the canyon and is compatible with the post-mining land use.

With respect to the flooding or stream flow alteration, water quality, and alteration or destruction of fisheries and aquatic habitat criteria, because there is no perennial or intermittent stream channels in either of these canyons and the fact that neither of these canyons have yielded any historical water quality data, none of these criteria have been impacted. Occasionally, flash flood events that are common to the region have likely occurred in these canyons that could feasibly release sediment loads to the drainage. However, given the distance of the nearest perennial streams supporting aquatic habitat, the Price River and Willow Creek, it is not very likely that this would provide a significant contribution of sediment to any receiving drainages where any fish or aquatic populations could suffer negative effects.

With respect subsidence damage to springs and seeps and to loss of groundwater and surface water availability, a total of 3 springs, Springs BM-30 (Adit #1), BM-31 (Near Mutual Spring) and B-32 (Gravel Springs) were monitored in the permit area up through the year 2001. The portals were sealed in Sowbelly and Hardscrabble canyons between 1988 and 1991 and the requirement in the approved MRP stated that the springs would be monitored for a period of two years after sealing of the mine unless significant changes in water quality were to occur. Since no changes were observed, monitoring was discontinued after 3rd quarter of 2001. As a result, it does not appear that any negative effects from mining occurred resulting in the loss of groundwater from the area.

Findings:

The information provided in the Earth Fax Engineering study provides further evidence that suspended solids sediments are not contributing pollution to receiving drainages. All hydrologic reclamation work completed to date appears to be within the guidelines of Phase III Bond Release criteria. Sediment from the reclaimed areas is not impacting any downstream areas. Surface water leaving the reclaimed areas is suitable for supporting the post mining land

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uses. Based on an impact analysis from the material damage criteria set forth in the CHIA, onsite impacts to the permit area have been minimized and offsite impacts have been prevented. Surface water quality monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan consistent with R645.301-731.224.1 and -224.2.

RECOMMENDATIONS:

Phase III Bond Release approval is recommended on all areas applied for in this application.

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