ATTACHMENT II-G

SURFACE WATER HYDROLOGY

Surface runoff from the proposed Shannon, LLC - Shannon Mine No. 4 site drains into an unnamed tributary to Buffalo Creek, unnamed tributary to Rockcastle Creek to the south, Lick Branch to the east, and Mud Creek to the north. The USGS Hydrologic Unit Code and Subwatershed Number for the area streams are 03160112-030 for Blue Creek and 03160112-020 for the unnamed tributary to Valley Creek as defined by the USDA Soil Conservation Service. Blue Creek is classified as "Fish & Wildlife" and Valley Creek is classified as Industrial Operations by Chapter 335-6-11 "Water Use Classifications For Interstate and Intrastate Waters" as taken from the Water Quality Program at ADEM. According to Chapter 335-6-10 of the same reference, the best usage of this classification is fishing, the propagation of fish, aquatic life, and wildlife, and any other usage except utilization as a supply for drinking or food processing, or for swimming and water contact sports.

All surface water leaving parts of the permit area, which has been disturbed by mining will be routed through twenty-four (24) proposed sediment basins prior to being discharged into state waters. Of the twenty-four (24) basins, five (5) are upstream structures and nineteen (19) are NPDES point sources. All basins are proposed as temporary and will be graded and revegetated prior to a request for a Phase II bond release. There are no perennial streams, intermittent streams, or

springs located within the proposed permit area. The only ponds located within the permit area are left from previous mining operations where water has been impounded. The only know use of surface water between the proposed permit area and the receiving stream is fish and wildlife. The Alabama Department of Environmental Management NPDES Permit No. is AL0076597.

Baseline surface water quality and quantity for this mine site will be characterized by samples taken from surface water monitoring sites 02462053 (downstream) on Mud Creek, SW-3 (downstream) on an unnamed tributary to Rockcastle Creek, 2462708 (downstream) on an unnamed tributary to Buffalo Creek, and SW-4 (downstream) on Lick Branch. Performance monitoring will be taken at surface water monitoring sites 02462053 (downstream) on Mud Creek, SW-3 (downstream) on an unnamed tributary to Rockcastle Creek, -2462708 (downstream) on an unnamed tributary to Buffalo Creek, and SW-4 (downstream) on Lick Branch. Due to the mine site being in the head waters of the receiving streams there are no upstream monitoring locations.

Surface water monitoring site 02462053 is located downstream of the permit area and drains approximately 2,720 acres or 4.25 square miles. Approximately 1004 acres will be disturbed by this mining operation at site 02462053. Surface water monitoring site SW-3 is located downstream of the permit area and drains approximately 531 acres or 0.83 square miles. Approximately 293 acres will be disturbed by this mining operation at site SW-3. Surface water monitoring site

SW-4 is located downstream of the permit area and drains approximately 512 acres or 0.80 square miles. Approximately 454 acres will be disturbed by this mining operation at site SW-4. Surface water monitoring site 2462708 is located downstream of the permit area and drains approximately 922 acres or 1.44 square miles. Approximately 471 acres will be disturbed by this mining operation at site 2462708. Slope conditions within these watershed range from slight to severe. Data collected from surface water monitoring site 02462053 and -2462708 will be used to predict the water quality at these sites. Both watersheds have been affected from pre-law surface and underground mining. Elevations range from approximately 390 ft. MSL at the monitoring sites to approximately 660 ft. at the drainage divide.

Samples collected from surface water monitoring site 02462053 on Mud Creek and 2462708 on an unnamed tributary to Rockcastle Creek downstream of the proposed mine site will be used in the water quality projections. The locations of 02462053 on Mud Creek and -2462708 on an unnamed tributary to Buffalo Creek are shown on the attached Hydro/Geo Map. Surface water monitoring site 02462053 was sampled for performance monitoring on seventy-six (76) occasions by the Alabama Land And Mineral Corp., Walker Services Co., B & K Services, and PERC Engineering Co., Inc.'s Laboratory between the dates of 03-07-88 and 03-24-11. Surface water monitoring site -2462708 was sampled for performance monitoring on twenty-six (26) occasions by the PERC Engineering Co., Inc.'s Laboratory between the dates of 12-03-04 and 03-24-11.

Samples analyzed by PERC Engineering Co., Inc's Laboratory were analyzed for the following parameters: pH, total iron, total manganese, total suspended solids, specific conductance, sulfates, acidity, and alkalinity. For the Surface Water results see the attached surface water analysis.

Additional surface water samples were collected and analyzed by PERC Engineering Co., Inc's Laboratory from the existing basins (001, 003 and 022) permitted by Shannon, LLC for P-3859 and basins 008A, 009, 010, 015, and 015A permitted by Alabama Land and Mineral, Inc. for P-3699. These samples represent the existing surface water conditions from the previously mined areas. Samples from the basins listed above show that surface water quality at this site is of good quality and should not pose any problems. The average surface water quality from the existing basins were pH 7.17 s.u., Fe 0.98 mg/l, TSS 9.7 mg/l, Se 5.7 µg/l, Ag <2.5 µg/l, Zn 42.3 µg/l, and Flow 0.198 cfs. All parameters were within the limits of the permit as set forth by the Alabama Department of Environmental Management. See attached sheets for surface quality of basins from the previously mined areas. For the locations of the surface water monitoring sites see the attached Hydro/Geo Map.

All parameters mentioned above were plotted vs. stream flow (in CFSM) to characterize water quality in the receiving streams at different flowrates prior to mining by Shannon, LLC at this proposed facility. Baseline conditions at the 7Q2,

Average, and 2 yr. flowrates are given in the Determination of the Probable Hydrologic Consequences (Attachment II-H).

A topsoil variance is proposed for this facility.

Classification of all soils on a soil-type specific basis within such a large watershed would be prohibitive, therefore, the "Hydrologic Assessment, Eastern Coal Province Area 23, Alabama" was utilized in obtaining the dominant soil associations for these watersheds. The dominant group is the Montevallo-Enders-Townley Series.

MONTEVALLO SERIES:

In the Montevallo series are shallow and very shallow, excessively drained soils formed from weathered shale. The soils are on narrow, sloping ridgetops and on moderately steep or steep hillsides of the Southern Appalachian Plateau. The following describes a representative profile:

0 to 6 inches, yellowish-brown shaly silt loam.
6 to 22 inches, yellowish-brown shaly silty clay loam; 75 to 90 percent fragments of shale.
22 inches +, light olive-brown, highly fractured, level, thin-bedded, fissile shale.

The texture of the underlying material ranges from loam to silty clay loam, and in most places it is yellowish brown. Fragments of shale make up 50 to 90 percent of the profile. These soils are very strongly acid, and their natural fertility and

content of organic matter are low. Water enters these soils at a moderate to slow rate; it moves at a moderate to rapid rate through the profile. The root zone is shallow, and the available moisture capacity is very low.

ENDERS SERIES:

Soils of the Enders series are moderately deep and deep, well drained, and gently sloping to moderately steep. They formed in material weathered from interbedded shale and sandstone. These soils are on ridgetops on the Southern Appalachian Plateau and are also on some of the side slopes. The following describes a representative profile:

0 to 5 inches: brown, very friable loam.
5 to 40 inches: red, firm silty clay; has some yellowish-brown mottles in lower part; blocky structure
40 to 52 inches: mottled red and brown, firm silty clay
52 inches +: level-bedded shale

These soils are very strongly acid. Their content of organic matter and their natural fertility are low. Crops grown on these soils make good response to lime and fertilizer. Water enters the soils readily and moves through the profile at a moderate to slow rate. The available moisture capacity is moderate to low. The root zone is moderately deep.

TOWNLEY SERIES:

In the Townley series are shallow and moderately deep, well-drained soils of the Southern Appalachian Plateau. The soils are gently sloping and are on ridgetops and moderately steep side slopes. The following describes a representative profile:

0 to 5 inches, brown loam.
5 to 20 inches, red silty clay mottled with brown in the lower part.
20 to 26 inches, brown silty clay with red and brown mottles.
26 inches +, level-bedded shale.

These soils are very strongly acid, and their natural fertility and content of organic matter are low. Infiltration and permeability are moderate to slow. The available moisture capacity is low; plants may be damaged by lack of water during even a short period of drought. The root zone is shallow.