

Applicant: <u>Shannon, LLC</u>
Mine Name: <u>Shannon Mine No. 4</u>
Permit Number: <u>P-3959</u>

III-E 880-X-8E-.06(1)(I)7(j)

HYDROLOGIC MONITORING PLAN

COMPANY NAME Shannon, LLC

MINE NAME Shannon Mine No. 4 COUNTY(IES) Jefferson & Tuscaloosa

*A MAP SHOWING ALL MONITORING POINTS MUST ACCOMPANY THIS PLAN

I. Surface Water Monitoring Program: (Discharge Points)

List each discharge point to be monitored and indicate type or source of discharge	List parameters to be sampled for each discharge point	List frequency of sampling for each discharge point	Duration of Monitoring
Basins: 001, 002 003, 008 009, 010 012, 013 015, 016 017, 018 019, 020 022, 023 052, 053 076	pH Iron (Fe) Total Suspended Solids (TSS) **Manganese (Mn)	Twice monthly	Until joint approval by ASMC and ADEM. In no case sooner than ASMC approval of Phase II Bond release.

** Manganese will only be analyzed when require to be in accordance with the NPDES permit. See attached [Hydrologic Monitoring Plan Map](#) for all monitoring site locations.

Note: Performance monitoring to commence no sooner than original opening of mine.

Note: If a sample is taken during or within 24 hours after an applicable precipitation event, (an Increase in discharge volume caused by an applicable 24-hour precipitation event an exemption as allowed by the NPDES permit for Iron (total), Manganese (total) and Total Suspended Solids may be claimed and Setteable Solids, Ph and Flow run and reported. The exemption is only applicable if the ADEM “New Source Coal Mine and Associated Discharge Limitations, Conditions and Requirements” are followed. .

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I. Surface Water Monitoring Program (continued)

Basins 001 will be monitored as specified below:

Parameter	Discharge Limitations			Monitoring Requirements	
	Daily Minimum	Monthly Average	Daily Maximum	Sample Type	Measurement Frequency
Specific Conductance 00095	****	Report µS/cm	Report µS/cm	Grab	2/Month
Sulfate (As S) 00154	****	Report mg/L	Report mg/L	Grab	2/Month
pH 00400	6.0 s.u.	****	9.0 s.u.	Grab	2/Month
Solids, Total Suspended 00530	****	35.0 mg/L	70.0 mg/L	Grab	2/Month
Selenium, Total Recoverable 00981	****	5.0 µg/l	20.0 µg/l	Grab	1/Month
Iron, Total (As Fe) 01045	****	3.0 mg/L	6.0 mg/L	Grab	2/Month
Manganese, Total (As Mn) 01055	****	2.0 mg/L	4.0 mg/L	Grab	2/Month
Zinc, Total Recoverable 01094	****	1305 µg/l	1305 µg/l	Grab	1/Month
Flow, In Conduit or Thru Treatment Plant 50050	****	Report MGD	Report MGD	Instantaneous	2/Month
Toxicity, Ceriodaphnia Acute 61425	****	****	0 pass(0)/fail(1)	Grab	1/Quarter
Toxicity, Pimephales Acute 61427	****	****	0 pass(0)/fail(1)	Grab	1/Quarter
Solids, Total Dissolved (TDS) 70296	****	Report mg/L	Report mg/L	Grab	1/Quarter

All parameters listed above will be sampled and analyzed in accordance with the approved NPDES Permit.

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I. Surface Water Monitoring Program (continued)

Basins 002, 003, 022, 023, 052, 053, and 076 will be monitored as specified below:

Parameter	Discharge Limitations			Monitoring Requirements	
	Daily Minimum	Monthly Average	Daily Maximum	Sample Type	Measurement Frequency
Specific Conductance 00095	****	Report µS/cm	Report µS/cm	Grab	2/Month
Sulfate (As S) 00154	****	Report mg/L	Report mg/L	Grab	2/Month
pH 00400	6.0 s.u.	****	9.0 s.u.	Grab	2/Month
Solids, Total Suspended 00530	****	35.0 mg/L	70.0 mg/L	Grab	2/Month
Selenium, Total Recoverable 00981	****	5.0 µg/L	20.0 µg/L	Grab	1/Month
Iron, Total (As Fe) 01045	****	3.0 mg/L	6.0 mg/L	Grab	2/Month
Manganese, Total (As Mn) 01055	****	2.0 mg/L	4.0 mg/L	Grab	2/Month
Flow, In Conduit or Thru Treatment Plant 50050	****	Report MGD	Report MGD	Instantaneous	2/Month
Toxicity, Ceriodaphnia Acute 61425	****	****	0 pass(0)/fail(1)	Grab	1/Quarter
Toxicity, Pimephales Acute 61427	****	****	0 pass(0)/fail(1)	Grab	1/Quarter
Solids, Total Dissolved (TDS) 70296	****	Report mg/L	Report mg/L	Grab	1/Quarter

All parameters listed above will be sampled and analyzed in accordance with the approved NPDES Permit.

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I. Surface Water Monitoring Program (continued)

Basins 008, 009, 010, 012, 013, 015, 016, 017, 018, 019, and 020 will be monitored as specified below:

Parameter	Discharge Limitations			Monitoring Requirements	
	Daily Minimum	Monthly Average	Daily Maximum	Sample Type	Measurement Frequency
Specific Conductance 00095	****	Report µS/cm	Report µS/cm	Grab	2/Month
Sulfate (As S) 00154	****	Report mg/L	Report mg/L	Grab	2/Month
pH 00400	6.0 s.u.	****	9.0 s.u.	Grab	2/Month
Solids, Total Suspended 00530	****	35.0 mg/L	70.0 mg/L	Grab	1/Week
Solids, Total Suspended 00530	****	Report lbs/day	Report lbs/day	Grab	1/Week
Selenium, Total Recoverable 00981	****	5.0 µg/l	20.0 µg/l	Grab	1/Month
Iron, Total (As Fe) 01045	****	3.0 mg/L	6.0 mg/L	Grab	2/Month
Manganese, Total (As Mn) 01055	****	2.0 mg/L	4.0 mg/L	Grab	2/Month
Flow, In Conduit or Thru Treatment Plant 50050	****	Report MGD	Report MGD	Instantaneous	1/Week
Toxicity, Ceriodaphnia Acute 61425	****	****	0 pass(0)/fail(1)	Grab	1/Quarter
Toxicity, Pimephales Acute 61427	****	****	0 pass(0)/fail(1)	Grab	1/Quarter

All parameters listed above will be sampled and analyzed in accordance with the approved NPDES Permit.

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HYDROLOGIC MONITORING PLAN (continued)

A. Reporting and Recording Specifications:

a) NPDES outfalls:

Reporting as required by NPDES permit to Alabama Department of Environmental Management plus a simultaneous Notice of Filing to ASMC containing the following:

- 1) Name of Company
- 2) Name of Mine
- 3) ASMC permit number
- 4) NPDES number
- 5) Sampling period covered by report
- 6) List of the discharge points sampled and analysis results

b) Other:

B. Non-Compliant Discharge Reporting:

Reporting as required by the NPDES permit to Alabama Department of Environmental Management plus simultaneous copy (indicating ASMC permit number) to ASMC.

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HYDROLOGIC MONITORING PLAN (continued)

II. Other Surface Water Monitoring.

Bodies of water receiving discharges from the mine:

List Monitoring Points and indicate type or describe location	List Parameters to be sampled	Frequency	Duration of Monitoring (minimum)
02462053 (downstream on Mud Creek)	Discharge pH Manganese Iron Total Suspended Solids Specific Conductance	Quarterly	Life of mine
SW-4 (downstream on Lick Branch)	Discharge pH Manganese Iron Total Suspended Solids Specific Conductance	Quarterly	Life of mine
-2462708 (downstream on U.T. to Buffalo Creek)	Discharge pH Manganese Iron Total Suspended Solids Specific Conductance	Quarterly	Life of mine
SW-3 (downstream on U.T. to Rockcastle Creek)	Discharge pH Manganese Iron Total Suspended Solids Specific Conductance	Quarterly	Life of mine

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HYDROLOGIC MONITORING PLAN (continued)

A. Reporting and Recording Specifications:

- 1) Frequency of Reporting: Quarterly

- 2) Contents of Report: Name of company, mine name, ASMC permit number and for all monitoring locations, the dates samples were taken and sample results for each parameter and who collected and analyzed the samples.

III. Monitoring requirements for removal of sediment ponds and other treatment facilities:

Monthly for 6 months prior to application for approval to remove facility. Monitoring data will be submitted to ASMC with application to remove the facility.

Monitoring sites shall be located to sample water entering the facility (i.e., untreated drainage).

Show proposed locations on the [Hydrologic Monitoring Plan Map](#).

Parameters to be samples shall be those required by the NPDES permit.

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HYDROLOGIC MONITORING PLAN (continued)

IV.
A. Monitoring requirements for Phase II bond release:

List Monitoring Sites	Parameters	Sample Frequency	Duration of Monitoring
inflow into the following basins:			
001, 002 002B, 003, 003A 008, 008A 009, 010 012, 013 015, 015A 016, 016A 017, 018 019, 020 022, 023 052, 053 076	pH Iron (Fe) Total Suspended Solids (TSS) *Manganese	Monthly	No less than parameters monthly for previous 6 months prior to application for Phase II Bond release.**
If no flow to basins during 6 month period:	pH Iron (Fe) Total Suspended Solids (TSS) *Manganese		In pond Sample

** For the Increment within which the respective basin is bonded, or the respective basin's drainage area is located.

B. Reporting:
Reports shall be submitted with application for Phase II Bond Release indicating Sample location number, monitoring period and analysis results and date for each sample, plus sampling and analytical data. A map showing location of the sample sites should be included.

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HYDROLOGIC MONITORING PLAN (continued)

V. Groundwater Monitoring

List Monitoring Sites and indicate type of site	Parameters	Frequency (minimum)	Duration of Monitoring
MW-1722 (below Jagger Coal Seam)	pH Iron (Fe) Manganese (Mn) Specific Conductance Water level	Quarterly	Life of Mine
MW-1723 (below Jagger Coal Seam)	pH Iron (Fe) Manganese (Mn) Specific Conductance Water level	Quarterly	Life of Mine

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HYDROLOGIC MONITORING PLAN (continued)

A. Reporting and Recording

Reports to be filed with ASMC quarterly supplying the following information: Company name, mine name, permit number, and for each monitoring site, the date and sample results for each parameter. Include sampling and analytical information for all samples.

VI. Maintenance of records and Availability for Inspection:

- a) Active Mining - copies of all monitoring records shall be maintained at office.
- b) During periods of temporary cessation of operations and after active mining, all monitoring records will be kept at:

Shannon, LLC (Office)

P. O. Box 621 (Address)

Jasper, AL 35502 (City & State)

David Muncher (Custodian of Records)

- c) All monitoring records will be made available upon request to ASMC Personnel for inspection.

VII. Describe how the data obtained from the performance monitoring may be used to determine the impacts of the operation upon the hydrologic balance. Describe how parameters to be monitored relate to the suitability of the surface and groundwater for current and approved postmining land use.

Surface water sites SW-3, SW-4, 02462053, and -2462708 are located downstream of all mining at the proposed Shannon Mine No. 4. Results of analysis as outlined in the monitoring plan can be compared to baseline data to determine impact to the receiving stream once mining begins. Groundwater monitoring sites MW-1722 and MW-1723 will monitor the characteristics of the aquifer below the target coal seams. Performance monitoring data will be compared to results of analysis from baseline sampling to determine impact to these aquifers and be compared to predictions made in the PHC.

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VIII. Please NOTE: ALL PERFORMANCE MONITORING REPORTS should be submitted in duplicate. For companies with multiple permits, each permit should have a corresponding monitoring report. Sites serving multiple permits should be included in all pertinent monitoring reports.

IX. If a waiver is requested for a particular water-bearing stratum, give details. 880-X-8H-.06-(1)(h)(2)

None proposed.

X. Plans For Recording and Reporting Data (779.13)

Describe how surface and groundwater quantity and quality data will be collected, recorded, and reported to the Regulatory Authority according to Section 816.52.

Surface water samples shall be taken by the 'grab' method. Flowrate measurement of surface water samples shall be according to ASTM D3858 "Standard Practice for Open Channel Flow Measurement of Water by Velocity - Area Method" or other equally valid approved methods. Groundwater samples shall be taken according to Standard Methods 105 "Collection and Preservation of Samples" and 906A "Collection" or other equally valid approved methods. pH of all samples will be measured in the field. The sample will be stored in ice and all other parameters will be analyzed within their allowable holding times as specified by Standard Methods. Practices employed concerning the volume of groundwater extracted at groundwater monitoring sites prior to sampling is outlined as follows: Where recharge of groundwater is sufficient, three well volumes of groundwater (measured from the static depth) are pumped prior to sampling so the sample obtained is from recharge. Where recharge is slow, and three well volumes cannot be obtained within the monitoring cycle (usually monthly), only one well volume will be pumped. The well will then be allowed to recharge and a sample will be obtained after a volume equal to the volume of the pump line has been discharged. In infrequent instances where recharge is very limited, and the volume of water in the well is too small to be pumped to the surface, a 'bottom sampler' is employed to bail as much water as possible from the well. The well will then be allowed to recharge and the bottom sampler will be used to obtain a sample when ample groundwater is present to be collected. Sampling will be recorded and reported to the Regulatory Authority as outlined in Part III-D & E of this application.