



STATE OF ALABAMA
SURFACE MINING COMMISSION

P.O. BOX 2390 - JASPER, ALABAMA 35502-2390
(205) 221-4130 • FAX: (205) 221-5077

MEMORANDUM

TO: Sherry Wilson
Office of Surface Mining

Mr. Jeff Kitchens
Department of Environmental Management

Mr. Frank White
Alabama Historic Preservation Officer

The District Engineer
U.S. Corps of Engineers

Alabama Department of Industrial Relations
Division of Safety & Inspection

BLM - District Office

State of Alabama
Abandoned Mine Land Reclamation

Walker County Commission

U.S. Fish & Wildlife Service

Mr. Keith Guyse, Fish & Game Division

Mr. Mitch Reid - Alabama Rivers Alliance

FROM: JOHNATHAN E. HALL, DIRECTOR

RE: **PERMANENT PROGRAM PERMIT FOR:**

Permit P-3983-64-21-S (Burton Bend Mine No. 3)

Pursuant to the Alabama Surface Mining Commission Regulation 880-X-8K-.12(2), we are hereby notifying you of the issuance of the above permit.

You may also view a copy of this permit at our web address of:

<http://surface-mining.alabama.gov/PermitDecisions.html>

Enclosed for your information and file is a copy of the permit which shows the legal description of the mine site.

JEH/ml



STATE OF ALABAMA SURFACE MINING COMMISSION

Page 1 of 6

Permit Number:P- 3983-64-21-S

License Number:L- 836

PERMIT TO ENGAGE IN SURFACE COAL MINING OPERATIONS

Pursuant to **The Alabama Surface Mining Control and Reclamation Act of 1981**, as amended, **ALA. Code** Section 9-16-70 et. seq. (1975) a permit to engage in Surface Coal Mining Operations in the State of Alabama is hereby granted to:

Centennial Natural Resources, LLC
Post Office Box 2420
Jasper, AL 35502-2420
(Burton Bend Mine No. 3)

Such operations are restricted to 279 acres as defined on the permit map and located in:

SW/NW, NW/SW, SE/SW, SW/SW of Section 17; NE/SE, SE/SE, SW/SE, NW/SE, SE/SW, SW/SW of Section 18; NW/NW, NE/NW, SE/NW, SW/NW, NW/SW, NE/SW, NW/NE, SW/NE, NE/NE of Section 19; NE/NW of Section 20; Township 14 South, Range 5 West, all in Walker County, Alabama.

This permit is subject to suspension or revocation upon violation of any of the following conditions:

1. The permittee shall conduct Surface Coal Mining and Reclamation Operations in accordance with the plans, provisions and schedules in the permit application.
2. The permittee shall conduct operations in a manner to prevent damage or harm to the environment and public health and safety and shall notify ASMC and the public in accordance with ASMC Rule 880-X-OK-16 of any condition which threatens the environment or public health and safety.

3. Surface coal mining operations are restricted to those areas for which sufficient bond has been posted with ASMC. On the date of issuance of this permit, bond was posted only for increment(s) 6 consisting of 9 acres as defined on the permit map.
4. No mining disturbance is to occur on any part of the permit on which legal "right of entry" has not been obtained. When such rights are "pending" the applicant shall submit acceptable evidence, to the Director, that such rights have been obtained according to ASMC Regulation 880-X-8D-.07.
5. No disturbance is to occur on any properties on which land use comments from legal owners of record are "pending" prior to the applicant providing acceptable comments.
6. No disturbance is to occur in the 300' setback area to any occupied dwelling prior to the applicant providing acceptable evidence to ASMC of its having secured a waiver of each subject area signed by the owner of the dwelling.
7. No mining disturbance shall occur within the 100' setback of any public road or the relocation of any public road prior to the applicant providing acceptable evidence, to the Director, of its having secured approval for a waiver from the appropriate jurisdictional authority and specific written waiver from ASMC.
8. The permittee shall notify the ASMC and seek consultation with the US Fish and Wildlife Service if:
 - a. The permit is modified in any way that causes an effect on species or Critical Habitat listed under the Endangered Species Act of 1973.
 - b. New information reveals the operation may affect Federally protected species or designated Critical Habitat in a manner or extent not previously considered or
 - c. A new species is listed or Critical Habitat is designated under the Endangered Species Act that may be affected by the operation.
9. The permittee shall contact the ASMC and consult with the Alabama Historic Preservation Officer if the permit is modified or if previously unknown archaeological or historic resources are discovered on the permit area. Upon discovery of previously unknown artifacts or archaeological features the permittee shall cease operations until the Alabama Historic Preservation Officer approves resumption of operations.
10. All potential waters of the U.S. must be flagged with a 50 foot offset, in a flagging color different than the permit boundary, prior to conducting mining activities. Potential waters of the U.S. identified by Department of the Army letter dated June 26, 2014, Jurisdictional Number SAM-2014-00201-CMS.
11. An approved Army Corps of Engineers permit must be submitted to ASMC prior to conducting mining activities within the flagged 50 foot offset of potential waters of the U.S. areas.

CONDITIONS TO BE PLACED ON PERMIT P-3983-64-21-S

Page 3

12. Parameters of the Corps permit must be met and submitted to ASMC prior to mining activities in waters of the U.S.

DATE ISSUED: June 17, 2016
EFFECTIVE DATE: June 17, 2016
EXPIRATION DATE: June 16, 2021



Johnathan E. Hall, Director

The ASMC, acting by and through its Director, hereby finds, on the basis of information set forth in the application or from information otherwise available, that --

1. The permit application is complete and accurate and the applicant has complied with all requirements of the Act and the regulatory program.
2. The applicant has demonstrated that reclamation as required by the Act and the regulatory program can be accomplished under the reclamation plan contained in the permit application.
3. The proposed permit area is:
 - (a) Not within an area under study or administrative proceedings under a petition, filed pursuant to Chapter 880-X-7 to have an area designated as unsuitable for surface coal mining operations;
 - (b) Not within an area designated as unsuitable for mining pursuant to Chapter 880-X-7 or subject to the prohibitions or limitations of Section 880-X-7B-.06 and Section 880-X-7B-.07 of this chapter; or
4. For mining operations where the private mineral estate to be mined has been severed from the private surface estate, the applicant has submitted to the Regulatory Authority the documentation required under Section 880-X-8D.07 and Section 880-X-8G-.07 of this chapter.
5. The Regulatory Authority has made an assessment of the probable cumulative impacts of all anticipated coal mining on the hydrologic balance in the cumulative impact area and has determined that the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.
6. The applicant has demonstrated that any existing structure will comply with Section 880-X-2B-.01, and the applicable performance standards of Chapter 3 or 10.
7. The applicant has paid all reclamation fees from previous and existing operations as required by 30 C.F.R., Subchapter R.
8. The applicant has satisfied the applicable requirements of Subchapter 880-X-8J.
9. The applicant has, if applicable, satisfied the requirements for approval of a long-term, intensive agricultural, postmining land use, in accordance with the requirements of 880-X-10C-.58(4) and 880-X-10D-.52(4).
10. The operation will not affect the continued existence of endangered or threatened species, or result in destruction or adverse modification of their critical habitats, as determined under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.).

11. The Regulatory Authority has taken into account the effect of the proposed permitting action on properties listed or eligible for listing on the National Register of Historic Places. This finding is supported in part by inclusion of appropriate permit conditions or changes in the operation plan protecting historic resources, or a documented decision that the Regulatory Authority has determined that no additional protection measures are necessary.
12. For a proposed remaining operation where the applicant intends to reclaim in accordance with the requirements of Section 880-X-10C-.56 or 880-X-10D-.49, the site of the operation is a previously mined area as defined in Section 880-X-2A-.06.
13. Surface coal mining and reclamation operations will not adversely affect a cemetery.
14. After application approval but prior to issue of permit, ASMC reconsidered its approval, based on the compliance review required by Section 880-X-8K-.10(2)(a) in light of any new information submitted under 880-X-8D-.05(8).
15. The applicant has submitted the performance bond or other equivalent guarantee required under Chapter 880-X-9 of the ASMC Rules prior to the issuance of the permit.
16. For mining operations where a waiver is granted from the 100' setback from a public road according to 880-X-7B-.07, the interests of the public and affected landowners have been protected.
17. The Regulatory Authority has taken into account the effect of the proposed permitting action on properties listed or eligible for listing on the National Register of Historic Places. In a letter dated September 16, 2009, The University of Alabama, Office of Archaeological Research (OAR) documented a Phase I Cultural Resource Survey for approximately 764 acres in Walker County, Alabama, conducted August 28-September 3, 2009. This survey covered the eastern portion of the project area. As a result of the Phase 1 survey six new archaeological sites were added to the Alabama State Site File (ASSF), three isolated finds were recorded, and nine previously recorded sites were revisited during the survey. Eight of the nine previously recorded sites could not be located, 1Wa80 was relocated and the current investigation confirms the original recommendation that the site is ineligible for the National Register of Historic Places (NRHP). The three isolated finds are not eligible for the NRHP. The six new sites 1WA270-1Wa275 are not eligible for the NRHP due to lack of integrity at the site locations and paucity of cultural materials.
In a letter dated April 10, 2013, The University of Alabama OAR documented a Phase I Cultural Resource Survey for approximately 154 acres in Walker County, Alabama, conducted February 20-21, 2013. This survey covered the Western portion of the project area. As a result of the survey one new site, Site 1Wa283, was added to the ASSF and one isolated find was discovered although no ASSF number was assigned. Site 1Wa283 does not meet the minimum criteria for nomination and is recommended ineligible for

listing in the NRHP. Based on these findings the OAR recommends the project will not have an adverse effect on any significant historic properties within the area of projected effect and a finding of no properties is recommended. By a letter dated May 19, 2014, The State Historical Preservation Office (SHPO), based on the cultural resource assessments conducted by the OAR, determined that the project activities will have no effect on any cultural resources listed on or eligible for the NRHP and therefore concur with the project. This finding is supported in part by inclusion of appropriate permit conditions or changes in the operation plan protecting historic resources, or a documented decision that the Regulatory Authority has determined that no additional protection measures are necessary. Concerns for unknown resources, which might be discovered during mining, have been made conditions of the permit.

18. McGehee Engineering Corp (MEC) conducted a biological habitat assessment for Threatened and Endangered species/critical habitat (T&E) for approximately 400 acres in Walker County, Alabama from October 2013 thru June 2014. Possible summer roosting habitat for the Indiana bat and northern long-eared bat was present within the project area. Preferred trees are limited to the steeper slope in and around the project area. Mist Net surveys were conducted on the project site in June 2014. The presence of the Indiana Bat and the Northern Long-eared Bat was not detected. No habitat was found for the remaining listed, threatened and endangered species within the project boundary. By a comment letters dated July 7, 2014. The US Fish and Wildlife Service (FWS) concurred with the conclusion that no federally listed species/critical habitat occur in the project area. In a letter dated August 7, 2014, the Alabama Department of Conservation and Natural Resources (ADCNR) suggested a biological survey be conducted by trained professionals for the project area. The closest sensitive species is recorded in the ADCNR database as occurring approximately 1.6 miles from the subject site. US Army Corps of Engineers (USACE) authorization is forthcoming. The ASMC finds that the proposed operation will not jeopardize the continued existence of endangered or threatened species or critical habitat thereof.
19. The proposed permit area is:
 - a. Not within an area under study or administrative proceedings under a petition, filed pursuant to Chapter 880-X-7 to have an area designated as unsuitable for surface coal mining operations.
 - b. Not within an area designated as unsuitable for mining pursuant to Chapter 880-X-7 or subject to the prohibitions or limitations of Section 880-X-7B-.06 and Section 880-X-7B-.07 of this chapter.

BASED ON THESE FINDINGS, I RECOMMEND THAT THIS PERMIT BE ISSUED.

DATE: June 17, 2016



Mark Woodley, Permit Manager

/ml

cc: I & E, Permit File

Cumulative Hydrologic Impact Assessment
Centennial Natural Resources, LLC
Burton Bend Mine No. 3
ASMC P-3983

I. General Information	Page 2
A. Geology of the Warrior Coal Basin	Page 2
B. Historical and Active Coal Mines	Page 3
II. Cumulative Impact Area	Page 3
A. Geologic/Hydrogeologic Information	Page 4
i. Geology	Page 4
ii. Potentially Acid- and Toxic-Forming Materials	Page 4
iii. Surface Water	Page 5
iv. Ground Water	Page 6
Domestic Wells	Page 7
Company Installed Wells	Page 7
B. Coal Processing Waste	Page 7
C. Material Damages	Page 7
III. Findings	Page 8
A. Historical Coal Mines	Page 8
B. Potentially Acid- and Toxic-Forming Materials	Page 8
C. Surface Water	Page 9
D. Ground Water	Page 11
IV. Conclusion	Page 12
V. Tables and Maps	Page 13

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Centennial Natural Resources, LLC

Burton Bend Mine No. 3

ASMC: P-3983

NPDES: AL0068888

As required under Federal Public Law 95-87, Section 510(b)(3), the Alabama Surface Mining Commission (ASMC) must find in writing the following proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The applicant must submit a determination of probable hydrologic consequences of mining and reclamation operations in Part II.H of the permit application for areas both on and off the mine site. This determination will allow the ASMC to assess probable cumulative impacts of all anticipated mining activities on the surface and ground water hydrology of the permit and adjacent areas as stated in Federal Public Law 95-87, Section 507(b)(11) and ASMC Rule 880-X-8E-.06(1)(g). The following assessment and findings are intended to fulfill the above stated requirements.

I. GENERAL INFORMATION

The Centennial Natural Resources, LLC P-3983 is for a surface coal mining operation originally proposed to encompass 279 acres including mining acres and haul/access roads, impoundments, stockpiles, equipment storage areas and diversion ditches.

The proposed mine site is located in part of Sections 17, 18, 19 & 20, Township 14 South, Range 5 West, County, Alabama as seen from the 2011 photo Sipsey Quadrangle.

The permit area is located west of the town of Sipsey, south of Sipsey Road, and east of the Mulberry Fork. It is directly adjacent to the McWane, Inc. Burton Bend Mine No. 2. Map No. 1 shows the permit location.

A. Geology of the Warrior Coal Basin

The Pottsville Formation of Early and Middle Pennsylvanian age in Alabama is divided into four fields: the Warrior, Cahaba, Coosa and Plateau fields. All fields were once connected by an unbroken area of coal measures, however separation occurred as a result of folding, faulting and erosion of uplifted areas.

The Warrior coal field is a gently folded or flat-lying area classified as the Cumberland Plateau. It lies in a large, gentle monoclinial structure that extends west into central Mississippi. The regional dip is towards the southwest. This regional southwest dip is interrupted by two anticlines (the Blue Creek anticline and the Sequatchie anticline) and three synclines or basins (the Blue Creek basin, Coalburg syncline and Warrior syncline). Structurally this permit area is near the Warrior Syncline (also called the Arkadelphia syncline) which parallels the Sequatchie anticline to the west.

The Warrior field has numerous normal faults that trend north and northwest up to 4 miles in length with up to 200 ft. of displacement (“Geology of Coal Resources of the Coal-Bearing Rocks of Alabama, Alabama Geological Survey Bulletin 1182-B”).

During the beginning of the Pennsylvanian subperiod (approximately 320 million years ago), most of Alabama was still part of a shallow, warm ocean basin. The transgressions and regressions of the seas lead to the rhythmic cycle of sandstone, underclay, coal beds, and shale with zones of marine and brackish water fossils that rest on the basal resistant conglomerate orthoquartzite of the Boyles Sandstone Formation. This sequence immediately repeats itself with similar rocks (marine shale, sandstone or clay, coal seam, freshwater shale and sandstone). This appears to show the rise of sea level, depositing marine sediments, then the falling of sea level allowing the coal producing forests to grow. This was followed by an influx of river deposited sands and muds, which would rapidly accumulate plant material. Then, the sea would rise again repeating the process.

At the end of the Pennsylvanian, the uplift of the region left the coal bearing ecosystem behind. During this periods of uplift, no new sediments could be deposited for at least 200 million years. The gap in time between the Pennsylvanian deposition and the Cretaceous deposition resulted in an unconformity that allows for surface coal mining to exist in the Alabama coal fields.

B. Historical and Active Coal Mines

There are approximately 24 acres located in the northeastern portion of the permit area that was originally an old coal washer/tipple site permitted under P-3298.

There are four coal mines within the vicinity and subwatershed that are considered active coal mines. “Active” refers to the permit being issued and at least one Increment bonded, but not necessarily the removal of coal. These permits are discussed in the following section.

II. CUMULATIVE IMPACT AREA (CIA)

The Cumulative Impact Area (CIA) is that area, including the permit area, within which impacts resulting from the proposed operation may interact with the hydrologic impacts of all other past, current and anticipated coal mining on the surface and groundwater systems.

There are four coal mines within the vicinity that will be considered in the Cumulative Impact Area (CIA) for this assessment. This includes the McWane, Inc. Permits: Burton Mine P-3753, located contiguous to the Burton Bend Mine No. 3 permit on the southeastern side, P-3942 Burton Bend Mine No. 2 also located contiguous to the Burton Bend Mine No. 3 permit on the southeastern side, P-3214 the Dilworth Washer and P-3219 Empire Town Creek Mine, both located east of the permit area. All of these mines are considered active, however at the time of this assessment P-3753, P-3942 and P-3214 are under active Temporary Cessation and P-3219 is considered active grading and seeding only. These permits are included in the Old Town Creek-Mulberry Fork subwatershed of the Mulberry Fork Watershed. These mining operations are

shown on Map No. 2 and an informational table is shown in Table 1 at the end of this assessment.

The critical point is a discharge-weighted technique used to find the concentrations of solutes at different locations in a stream system. Baseline conditions are needed for the general area as well as an estimate of solute concentrations for the proposed mining area. These are given in the PHC. For this permit, a site down stream of P-3753 (SW-2) on the Mulberry Fork will be used to estimate the cumulative effects of this mining operation with the effects of P-3753, P-3942, P-3214 and P-3219. This site is shown on Map No. 2.

The CIA for groundwater for this permit is limited to the proposed permit. The CIA has been selected based upon the Commission's assessment of the possible hydrologic impacts, which may occur as a result of mining operations. The subsurface hydrologic components considered in this assessment include all significant water-bearing units in, and within the vicinity of, the proposed permit and adjacent areas. Other areas of proposed, future mining are not known at this time; however, no cumulative impacts to groundwater are expected due to the lack of a widespread, regional aquifer system. Groundwater occurs in openings along fractures and bedding planes generally in a sandstone unit within 250 to 350 ft. of the surface.

A. Geologic/Hydrogeologic Information

i. Geology

The proposed P-3983 permit area is located in the Cumberland Plateau. Locally, the strata which outcrops in the immediate vicinity of the Burton Bend Mine No. 3 site includes the Pennsylvanian aged Pottsville Formation, which includes sandstones, shales, siltstones, clays and coal seams associated with the Black Creek coal group. There are two mineable coal seams within the proposed permit area. These include in descending order the Jefferson and Black Creek coal seams.

The Lick Creek seam (located above the Jefferson seam) does appear in the stratigraphy at this permit location, however it will not be recovered. It will be considered spoil material and was treated as such in the overburden testing.

The average total overburden depth (to the Black Creek seam) is 124 ft.

ii. Potentially Acid- and Toxic-Forming Materials

Five drill holes were used to describe the lithology for the general area, with three being used for overburden analysis. Drill cuttings were taken every 5 ft. or change in lithology to at least 5 ft. below the coal seam in most instances for analysis of potentially acid- and toxic-forming properties. For these samples, overburden analyses were conducted including paste pH, total sulfur, maximum potential acidity and neutralization potential in order to obtain the acid-base account of the overburden. Potentially acid- and toxic-forming materials are those that exhibit a pH of less than 4.0 s.u. or a deficiency in calcium carbonate equivalent of at least 0 tons per 1,000 tons of material (T/KT).

iii. Surface Water

The proposed permit area is located in the Mulberry Fork Watershed (HUC 03160109) of the Black Warrior River Basin. It is drained by Burton Creek and the Mulberry Fork. The Mulberry Fork is one of three forks that make up the Warrior River. The other two include the Sipsey Fork and the Locust Fork.

The Alabama Department of Environmental Management (ADEM) has classified this portion of the Mulberry Fork as “Fish and Wildlife” and “Public Water Supply”. According to ADEM Admin. Code r. 335-6-11-.02, “use classifications apply water quality criteria adopted for particular uses based on existing utilizations, uses reasonably expected in the future, and those uses not now possible because of correctable pollution but which could be made if the effects of pollution were controlled or eliminated. Of necessity, the assignment of use classifications must take into consideration the physical capability of waters to meet certain uses.” Map No. 3 shows the Black Warrior River Basin Classified Waters. This map can also be found on ADEM’s website at www.adem.alabama.gov.

To characterize the existing quality and quantity of water within the vicinity of the permit area, baseline data were obtained and submitted in the permit application. The data includes discharge, pH, specific conductivity, TSS, iron, manganese, sulfates, acidity and alkalinity. Downstream surface water monitoring site SW-1 on Burton Creek was sampled on eighteen occasions between 07-29-2009 and 02-20-2014. Upstream surface water monitoring site SW-2 on Burton Creek was sampled on eighteen occasions between 07-29-2009 and 09-23-2013. Site SW-10, within Burton Creek prior to the confluence of an unnamed tributary to Burton Creek, was sampled on six occasions between 11-07-2013 and 02-28-2014. Upstream surface water monitoring site SW-3 on an unnamed tributary to Burton Creek was sampled six times between 12-30-2014 and 07-01-2015. Upstream surface water monitoring site SW-3 on the Mulberry Fork was sampled thirteen times between 03-01-2011 and 02-20-2014. Downstream surface water monitoring site P-3753 SW-2 on the Mulberry Fork was reported thirteen times between 02-01-2011 and 02-20-2014. Surface water sites SW-2, SW-3, P-3753 SW-2 and SW-4 are monitoring sites for other permits with current data still being reported. These surface water sites, with the exception of P-3753 SW-2 for this permit will be monitored on a quarterly basis through final bond release or until approval by the Regulatory Authority.

Additional baseline sampling was performed at Station SW-6 downstream on an unnamed tributary to Burton Creek. These samples were taken to document existing water quality from the area permitted as P-3298. This area was an old coal washer/tipple and preparation site. There is approximately 25 acres of old mine waste and/or coal fines on top of the native soils, which has contributed to poor water quality in this unnamed tributary. This permit proposes to remove this material and dispose of it within the mine area in an approved manner, as outlined in the Acid Forming Material Handling Plan.

Additional parameters were monitored from each surface water site on a low flow and high flow discharge event. These parameters include specific metals associated with coal mining in the Warrior Coal Basin. These parameters will continue to be monitored bi-annually until a Phase II bond release or approval by the Regulatory Authority. Table 2 included at the end of this assessment presents the baseline data. Tables 3 and 3a. show the additional surface water baseline parameters.

During mining, sixteen sediment control structures will be used under ADEM National Pollutant Discharge Elimination System (NPDES) Permit Number AL0068888. The purpose of sediment basins is to allow sediment to settle and capture and not discharge into receiving streams.

iv. Ground Water

According to the Geohydrology and Susceptibility of Major Aquifers to Surface Water Contamination in Alabama; Area 3; USGS Water Investigations Report 88-4120, Area 3 which includes Cullman, Fayette, Lamar, Marion, Walker and Winston Counties, is grouped into three types of major aquifers. These are the Tuscaloosa, Pottsville and Bangor aquifers. The Pottsville aquifer is the most extensively used in the area and groundwater in the Warrior Basin occurs in fractures and along bedding planes in the Pottsville Formation. The sandstone beds within 250 to 350 ft. of the surface generally contain the most productive water-bearing openings. Regionally, the primary source of recharge to groundwater is rainfall, which averages 54 inches per year. The Pottsville aquifer is tightly cemented and has small primary porosity and permeability, and the yields of public water for wells completed in this aquifer are less than 0.15 Mgal/d (million gallons per day). This aquifer is also commonly high in iron.

Water in the Pottsville aquifer occurs under confined conditions due to sharp contrast in permeability within the aquifer. Groundwater usually occurs at depths of less than 200 ft. in secondary features such as openings along fractures and bedding planes. Only small amounts of groundwater suitable for domestic use are available in the weathered deposits. The quantity of water available to wells throughout the aquifer depends on the size and extent of the water-bearing openings.” Large water supplies are generally not available from the Pottsville Formation and no municipal wells tap the Pottsville Formation within the study area.

As stated earlier, rocks in the aquifer are tightly cemented and have little primary porosity and permeability. They contain water in secondary features and solutioning is not an effective agent for the enhancement of secondary features due to its silicic lithology (as compared to carbonate aquifers in the area). Due to the folded and faulted geologic structure, the Pottsville Formation is not continuous from one area to another. Groundwater movement between aquifers is restricted due to the confining beds, and movement within the aquifer generally is from hills and highland areas to streams and other areas of natural discharge.

Little is known about recharge and ground water movement in the Pottsville Formation,

however, water may move in other directions based on topographic features of the area or fracture systems in the formation. It is also mentioned that because of some perched water tables and irregular lensing properties of the Pottsville Formation that water levels are unpredictable and areal correlations are only possible within short distances.

Domestic Wells

A well inventory of the proposed permit area revealed 298 residences within a ½ mile radius of the proposed permit site. Thirteen residences have wells, with a total of 16 wells in the inventory area. Twelve of the wells are not in use, and the remaining four wells are used for outdoor or backup purposes. The residents in the area obtain water from the Jasper Water Authority.

Company Installed Wells

Groundwater monitoring sites used for describing the local characteristics within and adjacent to the Burton Bend Mine No. 3 include groundwater monitoring sites MW-1, MW-2, MW-6, P-3753 MW-4 and P-3753 MW-5. Monitoring wells MW-1, MW-2 and MW-6 will continue to be monitored for the life of the mine. Wells P-3753 MW-4 and P-3753 MW-5 were used to show the characteristics of the area.

Groundwater monitoring well MW-1 is drilled to a depth of approximately 130 ft. into a sandstone unit approximately 20 ft. below the Black Creek coal seam. It is cased to a depth of 26 ft. and monitors the characteristics of groundwater through the Black Creek coal seam.

Groundwater monitoring well MW-2 is drilled to a depth of approximately 152 ft. into a sandstone unit approximately 10 ft. below the Black Creek seam. It is cased to approximately 25 ft. and monitors the characteristics of groundwater through the Black Creek seam.

Groundwater monitoring well OB/MW-6 is drilled to a depth of 157.09 ft. into the Black Creek seam. It is cased to a depth of approximately 25 ft. and monitors the groundwater above and into the Black Creek seam.

Monitoring wells P-3753 MW-4 and P-3753 MW-5 are drilled to below the Black Creek seam. P-3753 MW-4 is drilled to a depth of 63.8 ft. and cased to 38.5 ft. P-3753 MW-5 is drilled to a depth of 48.4 ft. and cased to 20.0 ft. There is no lithologic drawing of these wells in the permit document, only narrative descriptions on the baseline analysis.

Baseline data was submitted for the monitoring wells. This data is summarized in Table 6 at the end of this assessment. Groundwater characteristics show similar quality to the aquifer characteristics of the Pottsville Formation. Table 6a. includes the complete set of data for monitoring well P-3753 MW-4 due to the proximity to the new permit location as well as the Mulberry Fork.

B. Coal Processing Waste

Coal processing waste (gob and slurry) will not be generated or disposed of at the site.

C. Material Damages

With respect to the CHIA, material damage to the hydrologic balance means the changes to the hydrologic balance caused by surface mining and reclamation operations to the extent that these changes would significantly affect present and potential uses as designated by the Regulatory Authority. This includes the hydrologic impact that results from the cumulation of flows from all coal mining sites in a cumulative impact area. Examples of material damage are: permanent destruction of a major regional aquifer; temporary contamination of an aquifer in use that cannot be mitigated; and solute contributions to streams above receiving stream standards.

A CHIA is based on the best currently available data and is a prediction of mining-related impacts to the hydrologic balance. Permittees (and permit applicants) are required to monitor water quality and quantity. Exceeding material damage thresholds might also cause significant reduction of the capability of an area to support aquatic life, livestock and wildlife communities.

III. FINDINGS

Based on the information presented above, the following findings have been made relative to the proposed permit area.

A. Historical Coal Mines

With regards to the historical surface mines in, and within the vicinity of, the proposed site, the possible cumulative effect of the previous mining along with the proposed operations on surface and ground water quality/quantity will be discussed in detail in the following Surface Water and Ground Water sections.

B. Potentially Acid- and Toxic-Forming Materials

Laboratory analyses of the bedrock overlying the Black Creek coal seam show that the overburden at the Burton Bend Mine No. 3 contains 2427 tons/acre excess CaCO_3 (calcium carbonate); a neutralization potential of +14.23, and an acid-base account of +10.75 (tons CaCO_3 /1000 tons overburden). It should be noted that an acid-base account is not a water quality prediction tool, but instead is used to support the ability of vegetation to be established and supported. According to the "Coal Mine Drainage Prediction and Pollution Prevention in Pennsylvania" publication by the Pennsylvania Department of Environmental Protection, excess neutralization potential most likely produces alkaline drainage.

There does exist 24 acres located in the north north/east portion of the permit area that was

identified as an old coal washer/tipple site prior to implementation of the permanent program permits. The area was eventually permitted as a preparation site, which was forfeited then reclaimed.

Borings identified the limits and thickness of the fill material that remained after the old coal washer ceased operations. This material is identified as potentially acid-forming material and will be handled as outlined in Attachment III–A-5, the Acid Forming Material Handling Plan. The treatment and proper handling of this material should enable the unnamed tributary to Burton Creek to improve water quality, subsequently improving the water in Burton Creek.

The materials handling plan included in the permit application will require any potentially acid- and toxic-forming strata encountered (such as spoiled coal) to be covered with a minimum of four ft. of non-toxic, non-combustible earthen material. Also, this material may not be placed within the root zone. The material will undergo relatively quick burial that will restrict the development of acid-forming conditions.

The sulfur percentages are very low in the overburden analysis, which is a major constituent in the acid-forming process. Such low sulfur values are a good indicator of inability for the acid forming process to begin and the overburden contains the ability to neutralize any potential acid that may be generated, though not anticipated.

C. Surface Water

Based on laboratory analysis of the samples collected at surface water sites SW-1, SW-2, P-3753 SW-2, SW-3, and SW-8 the water quality in this area shows neutral pH, low iron, low manganese and low to variable specific conductivity. The exceptions are at SW-6 on the unnamed tributary to Burton Creek and SW-10 that is on Burton Creek, both are identified in the watershed of the old coal stockpile and preparation site that will require a special handling plan.

The critical point for surface water evaluation is the downstream site on the Mulberry Fork, P-3753 SW-2. This site is downstream of all the other permits identified in the CIA. The data used is from both the P-3753 SW-2 site and SW-1 on Burton Creek in the PHC. SW-1 was chosen for the surface water projections because of the lower quality water that currently exists due to the historic mining. These points are shown on Map No. 2 at the end of this assessment.

The critical Point evaluation was used to determine the new concentration of total suspended solids (TSS) and iron (Fe) during mining at average flow.

$$C_{nc} = \frac{Q_a C_a + Q_c [(A_c - A_a) / A_c] C_g}{Q_a + Q_c [(A_c - A_a) / A_c]}$$

Where:

C_{nc} = new concentration at the critical point,

C_g = concentration from the general area,

C_a = concentration from the anticipated mine area,

A_c = drainage area above the critical point

A_a = anticipated mine area in the drainage basin,

Q_a = average flow from the anticipated mining area in the drainage basin, and

Q_c = average flow at the critical point

Using current monitoring data at the critical point and the information from the water quality and quantity projections, the new concentrations of analyzed parameters on Mulberry Fork P-3753 SW-2 are as follows:

	P-3753 SW-2
TSS C_{nc}	8.0 mg/L
Fe C_{nc}	0.43 mg/L

A worksheet is available in Table 4 following this assessment.

Changes in the quantity and quality of the waters in the streams draining the site are expected to be minimal due to the proposed mining activities. During mining, runoff from the disturbed areas will be diverted into sediment basins that are designed to retain all settleable solids, skim and retain all floating solids, and provide adequate detention volume and time to minimize the contribution of suspended solids and dissolved solids into the receiving streams. Effluent from the sediment basins will be monitored by the permittee in accordance with NPDES permit requirements issued by ADEM. The effluent will be chemically treated, if necessary, in accordance with the NPDES permit. The basins will be monitored bi-monthly through final bond release in order to characterize and document any effects the mining may have on the surface-water hydrologic balance.

Post-Mining water quality and quantity estimates provided by the applicant are based on several factors:

1. Baseline surface water quality
2. Estimated impact during mining
3. Size of the permit area compared to the size of the watershed
4. Amount of previous mining within the watershed

According to the permit application, this mine site is expected to have a negligible increase in base flow, average flows, and peak flow rates relative to the baseline conditions. Limits and monitoring requirements for these parameters can be found in both the Hydrologic Monitoring Plan for this permit, as well as the ADEM NPDES Permit No. AL0068888.

Aside from the identified acid forming materials, any small portion of potentially acid- and toxic-forming materials will undergo relatively quick burial that will minimize exposure of the materials with the atmosphere; thus lessening the potential for Acid Mine Drainage

(AMD) to develop. This, along with the sediment basins, vegetation of the disturbed areas and erosion control practices should serve to lessen impacts to the streams and surface water bodies. Should any increase in mineralization occur in the surface waters as a result of the mining operations, it is anticipated the levels will diminish and return to pre-mining concentrations once mining and reclamation activities are complete. Table 5 shows the post-mining water quality projections based on the downstream site Burton Creek.

D. Ground Water

Laboratory analyses of samples collected from the installed wells reveal the ground water within the bedrock strata below the Black Creek seam is neutral to slightly acidic. The water is mineralized with elevated levels of (at a minimum) iron, resulting in moderate conductivity measurements, which is typical of the Pottsville Formation. For a summary of the baseline data collected from the installed monitoring wells, please refer to Table 6 at the end of this assessment.

The proposed operations are not expected to have a permanent adverse impact on the overall quality of the ground water at the site or surroundings. No long-term impact is anticipated to the ground water quality for the aquifer below the Black Creek Seam due to the dip of the strata as well as the folding and structure of the area.

As discussed previously, the bedrock strata that will be excavated during the mining operations are predominantly non-acid and non-toxic. Should any increase in mineralization occur in the ground water as a result of the proposed activities, it is anticipated the levels will diminish and return to pre-mining concentrations once mining and reclamation activities are complete. Ground water will be further protected by properly abandoning and sealing all drill holes completed at the site (with the exception of blast holes) that will not be used for monitoring purposes. With regard to the availability of ground water after mining and reclamation is complete as compared to existing quantities, the backfilled spoil material will have a greater recharge capacity as compared to the undisturbed strata.

According to the permit application as well as published reports, groundwater movement is in the south and west directions towards the Mulberry Fork.

IV. CONCLUSION

The assessment of probable cumulative impacts of the Centennial Natural Resources, LLC P-3983 Burton Bend Mine No. 3 finds the proposed operations have been designed to prevent material damage to the hydrologic balance outside the proposed permit area.

V. TABLES AND MAPS

Table 1	CIA Mining Operations
Table 2	Ranges/Averages of Surface-Water Quality/Quantity
Table 3	Additional Surface Water Baseline Data High Flow
Table 3a.	Additional Surface Water Baseline Data Low Flow
Table 4	Critical Point Evaluation P-3753 SW-2
Table 5	Estimate of Post-Mining, Average Event Surface Water Quality
Table 6	Ground Water Baseline Data
Table 6a.	Ground Water Monitoring Site P-3753 MW-4 Data
Map No. 1	Permit and Adjoining Mining
Map No. 2	Cumulative Impact Areas
Map No. 3	Black Warrior River Basin Classified Waters

Table 1
Mining Operations in the Cumulative Impact Area

Permit No.	Permittee	Permit Name	Date Issued	Acres*	Current Condition	Coal Seams
P-3753	McWane, Inc.	Burton Mine	9-21-1995	530	Active, Temporary Cessation	Lick Creek Jefferson Black Creek
P-3942	McWane, Inc.	Burton Mine No. 2	5-18-2002	238	Active, Temporary Cessation	Jefferson Black Creek
P-3214	McWane, Inc.	Dilworth Washer	5-18-1983	80	Active, Temporary Cessation	
P-3219	McWane, Inc.	Empire Town Creek	7-11-1983	285	Active, Grading and Seeding Only	Lick Creek Jefferson Black Creek
*Acres at Issuance						

Table 2
Ranges/Averages of Surface-Water Quality/Quantity Stream Points
P-3983

Parameter	SW-1 DS Burton Creek	SW-2 US Burton Creek	P-3753 SW-2 DS Mulberry Fork	SW-3 US UT Burton Creek	SW-4 US Mulberry Fork	SW-6 DS UT Burton Creek	SW-10 Burton Creek w/in mine area
Discharge Rate (cfs)	5.1 – 38.3 (13.8)	0.010 – 10.2 (1.11)	640 – 8768 (3746.6)	0.005 – 1.28 (0.1802)	90.67 – 1445.0 (767.06)	0.51 – 4.49 (1.57)	0.30 – 2.36 (1.18)
Field pH (S. U.)	6.61 – 7.05	6.22 – 8.82	6.75 – 8.56	5.37 – 8.35	7.00 – 8.80	3.83 – 6.99	3.46 – 7.58
Total Suspended Solids (mg/L)	1 - 40 (8.6)	1 - 35 (6.7)	2 - 36 (69.8)	1 - 21 (6.3)	2 - 19 (8.1)	1 - 28 (9.3)	3 – 8 (5.8)
Total Iron (mg/L)	0.08 - 0.98 (0.43)	0.10 - 0.75 (0.29)	0.15 – 1.10 (0.41)	0.08 – 1.35 (0.53)	0.10 – 2.98 (0.58)	1.01 – 4.13 (2.53)	0.96 – 3.80 (2.46)
Total Manganese (mg/L)	0.37 – 1.59 (0.86)	0.01 – 0.30 (0.05)	0.04 – 0.43 (0.10)	0.07 – 2.76 (1.18)	0.05 – 0.88 (0.17)	3.36 – 6.30 (4.60)	0.42 – 5.00 (1.81)
Specific Conductivity 25 °C (µmhos/cm)	808 - 2340 (1562)	57 - 100 (70)	42 - 200 (124)	223 - 415 (311)	64 - 1693 (244)	357 - 565 (441)	133 – 582 (269)
Acidity (mg/L)	18 - 55 (35)	6 - 42 (16)	NR	0 - 33 (15)	NR	11 - 45 (31)	9 – 60 (25 0)
Alkalinity (mg/L)	109 - 400 (247)	5 - 21 (13)	NR	0 - 28 (9)	NR	0	0 – 29 (7)
Sulfates (mg/L)	296 - 758 (466)	0 - 71 (17)	NR	49 - 152 (90)	NR	108 - 197 (153)	20 – 182
Average values in parentheses. Averaged via all data, not seasonally. DS = Downstream US = Upstream UT = Unnamed Tributary NR = Not Reported							

Table 3
Additional Surface Water Baseline Data
High Flow Metals Data

Parameter	SW-1 25.5*	SW-2 1.59*	P-3753 SW-2 8768*	SW-3 1.28*	SW-4 1145*	SW-6 4.49*	SW-10 2.36*
Antimony (µg/L)	BDL	BDL	BDL	BML	0.77	BML	BML
Arsenic (µg/L)	1.09	0.3	0.27	0.69	BDL	0.56	BML
Beryllium (µg/L)	BDL	BDL	BDL	BML	BMD	BML	BML
Cadmium (µg/L)	0.57	BDL	BDL	0.12	BDL	0.19	BML
Chromium (µg/L)	BDL	BDL	BDL	BML	BDL	BML	BML
Copper (µg/L)	BDL	2.41	BDL	1.66	BDL	1.62	BML
Lead (µg/L)	0.54	0.48	BDL	BML	0.55	0.74	BML
Nickel (µg/L)	5.6	BDL	BDL	12.7	BDL	57.52	10.65
Selenium (µg/L)	0.4	BDL	BDL	BML	BDL	3.45	BML
Silver (µg/L)	BDL	BDL	BDL	BML	BDL	BML	BML
Thallium (µg/L)	BDL	BDL	BDL	BML	BDL	BML	BML
Zinc (µg/L)	BDL	BDL	BDL	37.61	8.71	104.62	18.23

*Streamflow in cfs
BML = Below Measurable Limits
BDL = Below Detection Limit

Table 3a.
Additional Surface Water Baseline Data
Low Flow Metals Data

Parameter	SW-1 5.1*	SW-2 0.01*	P-3753 SW-2 640*	SW-3 0.005*	SW-4 90.67*	SW-6 0.51*	SW-10 0.30*
Antimony (µg/L)	BML	BDL	BDL	BDL	0.39	BML	BML
Arsenic (µg/L)	0.3	0.48	0.43	1.15	BDL	1.11	0.4
Beryllium (µg/L)	BML	BDL	BDL	BDL	BDL	BML	BML
Cadmium (µg/L)	BML	BDL	BDL	BDL	BDL	0.70	0.12
Chromium (µg/L)	BML	BDL	BDL	BDL	BDL	BML	BML
Copper (µg/L)	0.94	BDL	BDL	1.3	BDL	5.72	1.22
Lead (µg/L)	BML	0.17	BDL	0.24	BDL	0.61	BML
Nickel (µg/L)	7.28	BDL	BDL	BDL	BDL	64.32	25.08
Selenium (µg/L)	2.91	0.36	BDL	0.54	BDL	3.59	1.16
Silver (µg/L)	BML	BDL	BDL	0.19	BDL	BML	BML
Thallium (µg/L)	BML	BDL	BDL	BDL	BDL	BML	BML
Zinc (µg/L)	BML	BDL	BDL	BDL	19.27	135.26	42.68
*Streamflow in cfs BML = Below Measurable Limits BDL = Below Detection Limit							

Table 4
Centennial Natural Resources, LLC P-3983
Critical Point Evaluation P-3753 SW-2

$$C_{nc} = \frac{Q_a C_a + Q_c [(A_c - A_a) / A_c] C_g}{Q_a + Q_c [(A_c - A_a) / A_c]}$$

C_{nc} = new concentration at the critical point,

C_g = concentration from the general area,

C_a = concentration from the anticipated mine area,

A_c = drainage area above the critical point

A_a = anticipated mine area in the drainage basin,

Q_c = average flow at the critical point

			Units
Standards:	A_c	29.16	sq mi
	A_a	1.7	sq mi
	Q_a	1.65	cfs
	Q_c	3230	cfs

Variables:	C_g	C_a	Units
TSS	8.0	8.6	mg/L
Fe	0.43	0.43	mg/L

Results:	C_{nc}
TSS	8.0 mg/L
Fe	0.43 mg/L

A_c Data from ARCMAP

A_a Data from P-3753 PHC

Q_a Data taken P-3753 PHC

Q_c Data taken P-3753 Surface Water Hydrology and DMR data

Table 5
P-3983 Estimate of Post-Mining, Average Event
Surface-Water Quality
SW-1

Parameter	Estimated Value
Flow (cfsm)	1.59
pH (s.u.)	6.83
Iron (mg/L)	0.96
Manganese (mg/L)	1.20
Specific Conductivity 25 °C (µmhos/cm)	1608
TSS (mg/L)	14

Table 6
P-3983
Groundwater Baseline Data

Parameter	MW-1	MW-2	MW-6	P-3753 MW-4	P-3753 MW-5
Water Level (ft. below surface)	216.67 – 258.17 (238.17)	390.39 – 397.39 (387.09)	358.59 – 367.59 (363.26)	248.4 – 255.4 (251.18)	308.0 – 310.0 (309)
Specific Conductivity 25 °C (µmhos/cm)	243 - 1075 (500)	151 - 246 (189)	118 - 282 (161.5)	123 – 405 (264.22)	960 - 2111 (1587)
Total Iron (mg/L)	1.11 – 12.69 (5.21)	1.38 – 17.81 (7.16)	0.23 – 1.86 (1.00)	0.02 – 3.62 (0.71)	0.97 – 34.18 (8.63)
Total Manganese (mg/L)	0.11 – 0.90 (0.42)	0.03 – 1.69 (0.44)	0.09 – 0.43 (0.23)	0.65 – 1.46 (0.86)	0.25 – 2.62 (1.41)
Field pH (s.u.)	5.76 – 7.04	6.13 – 10.98	6.50 – 7.28	4.92 – 5.74	6.55 – 7.37
Sulfates (mg/L)	2 - 322 (115)	2 - 127 (19.38)	2 - 22 (10.3)	19 – 190 (82.44)	118 – 1293 (675.7)

Average values in parentheses.

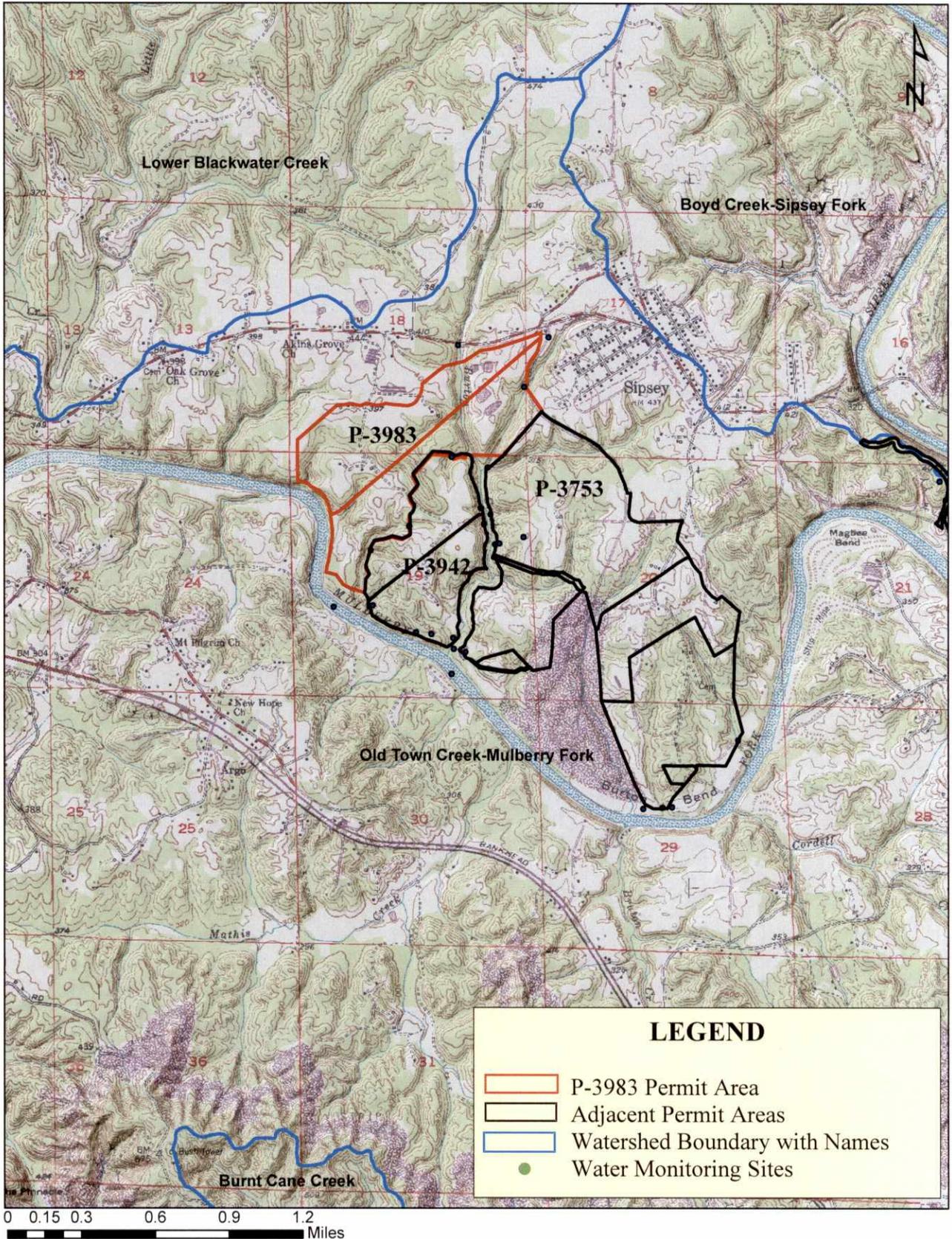
Averages calculated as geometric means

*BML – Below Measurable Limits

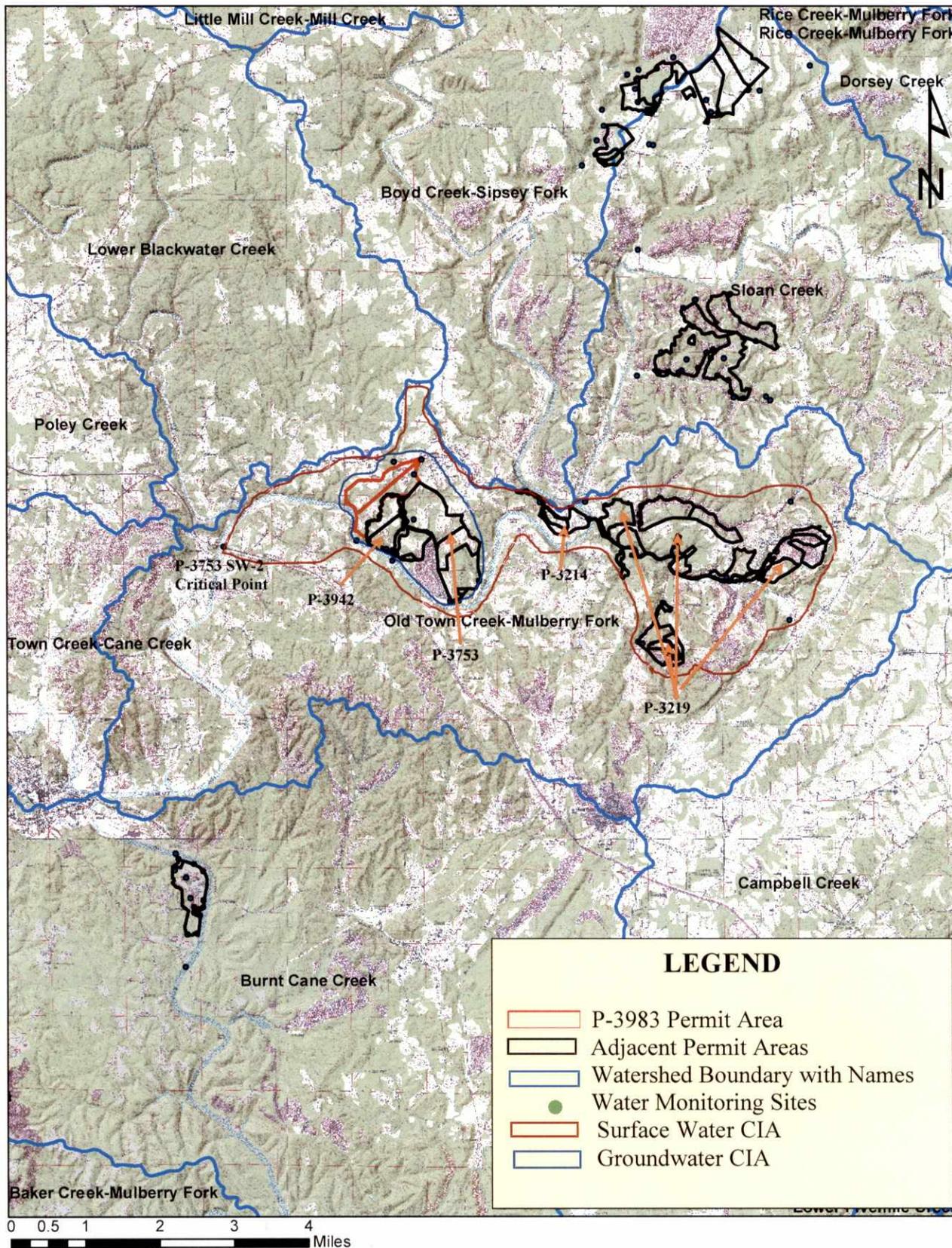
Table 6a.
Ground Water Monitoring Site P-3983 MW-4 Data
 Surface elevation 271.4 ft. (MSL)

Baseline													
Date	Depth Feet	pH s.u.	Fe mg/l	Mn mg/l	Spc umhos/cm	SO4 mg/l	Date	Depth Feet	pH s.u.	Fe mg/l	Mn mg/l	Spc umhos/cm	SO4 mg/l
3/28/1995	22.8	6.16	1.12	1.1	345	147	12/26/2005	19.7	4.98	0.55	1.7	407	20
4/5/1995	22.5	6.27	1.96	2.2	216	109	2/27/2006	21.6	5.06	2.95	2.5	1025	47
5/8/1995	22	6.03	0.31	0.3	510	180	6/28/2006	22.3	5.1	0.29	0.2	217	42
6/15/1995	21.2	5.77	1.19	0.01	350	210	9/27/2006	24.7	5.36	0.05	1.9	90	11
7/31/1995	22.2	6.05	0.6	0.2	383	135	12/26/2006	23.6	5.17	0.21	1	167	
8/7/1995	22.4	5.98	0.49	0.3	401	120	3/21/2007	21.2	5.13	0.1	1.1	306	41
8/23/1995	23.4	6.27	0.52	0.1	110	114	5/23/2007	23.7	4.17	0.13	1.4	265	42
4/8/1997	42	5.22	0.1	0.3	46	29	9/25/2007	22.5	5.15	0.31	1.4	503	42
8/13/1997	17	4.4	0.2	0.5	46		12/26/2007	25.8	4.92	0.19	0.1	210	41
11/28/1997	10	5.02	2.32	1.3	72	0.01	3/21/2008	21.8	5.27	0.21	1.5	406	59
3/25/1998	32	6.67	0.5	0.2	235		6/20/2008	20.5	5.34	0.38	0.9	318	62
6/3/1998	22	6.95	0.22	0.4	1021	60	9/16/2008	16.5	4.69	0.07	0.83	25	10
9/21/1998	18	6.72	0.51	0.5	125		12/1/2008	21.33	5.25	0.17	0.34	68	
10/27/1998	26	6.29	0.49	0.5	189	45	3/2/2009	14.42	5.27	0.73	0.38	79.6	22
2/24/1999	26	6.17	0.8	0.8	1077		7/6/2009	18.25	4.88	0.01	1.45	387	137
6/29/1999	24	6.24	1.74	1.4	1680		4/6/2009	14.17	4.84	0.07	0.5	169.1	56
9/27/1999	24	6.41	0.76	0.6	245		10/5/2009	16	4.95	0.31	1.18	331	109
12/2/1999	28	6.88	0.38	0.2	529		1/18/2010	19	4.81	0.68	1.4	359	708
3/3/2000	28	6.65	0.42	0.6	1019		4/5/2010	16.5	4.99	2.43	1.33	378	124
6/26/2000	30	6.7	0.44	0.5	1101		8/16/2010	21	4.64	0.95	1.96	655	274
9/22/2000	28	6.81	0.54	0.7	312		11/1/2010	22	5	0.25	2.18	796	349
12/21/2000		6.31	0.27	1.2	941		2/1/2011	20.33	4.98	0.36	1.24	421	164
2/19/2001	12	5.12	0.12	0.5	133		5/2/2011	16	4.58	0.24	0.75	212.3	57
6/29/2001	12	7.11	0.41	0.3	388	28	7/19/2011	21	5.04	2.16	1.01	375	410
9/13/2001	12	6.88	0.06	0.4	275	29	2/3/2012	20	5.11	1.02	0.6	184.8	18
12/13/2001	12	6.8	0.07	0.2	312	29	6/5/2012	22	4.65	0.61	1.08	1501	709
3/4/2002	12	6.91	0.23	0.3	297	32	8/7/2012	22	4.73	0.23	1.06	146	129
6/6/2002	13	6.77	0.18	0.03	53	24	11/8/2012	23	4.95	0.28	0.97	405	190
9/9/2002	13	6.86	0.17	0.04	61	201	3/6/2013	17	5.51	0.46	0.65	201	80
12/10/2002	12	6.6	0.24	0.4	53	28	5/21/2013	17	4.93	1.23	0.7	147	30
3/11/2002	12	6.61	0.27	0.4	83	38	9/4/2013	21	4.92	0.29	0.82	265	56
9/30/2003	12	6.7	0.68	0.5	179	42	11/19/2013	23	5.2	3.62	0.98	371	84
12/22/2003	12	6.82	0.61	0.6	190	40	2/20/2014	20	5.15	0.02	0.82	207	49
3/29/2004	12	5.92	0.25	1	85	36	5/20/2014	18	5.15	0.29	0.67	123	19
6/30/2004	13	6.09	0.22	1.1	98	15	8/5/2014	21	5	0.09	1.46	352	131
9/24/2004	10	6.09	0.74	0.6	386	75	11/4/2014	22	5.74	0.07	0.66	307	103
12/29/2004	11	6.7	0.07	1.6	62	6	3/23/2015	18	5.16	0.25	0.47	212.8	60
3/29/2005	12	6.02	0.1	0.5	121	35	6/18/2015	25	4.75	2.9	0.68	271	101
6/23/2005	14	6.87	0.06	0.2	202	13	8/14/2015	21	4.53	0.2	0.72	280	76
9/29/2005	21.1	4.87	0.07	0.7	109	37	11/9/2015	22	5.1	0.08	0.6	329	131

Map No. 1
P-3983
Permit Area and Adjacent Mining

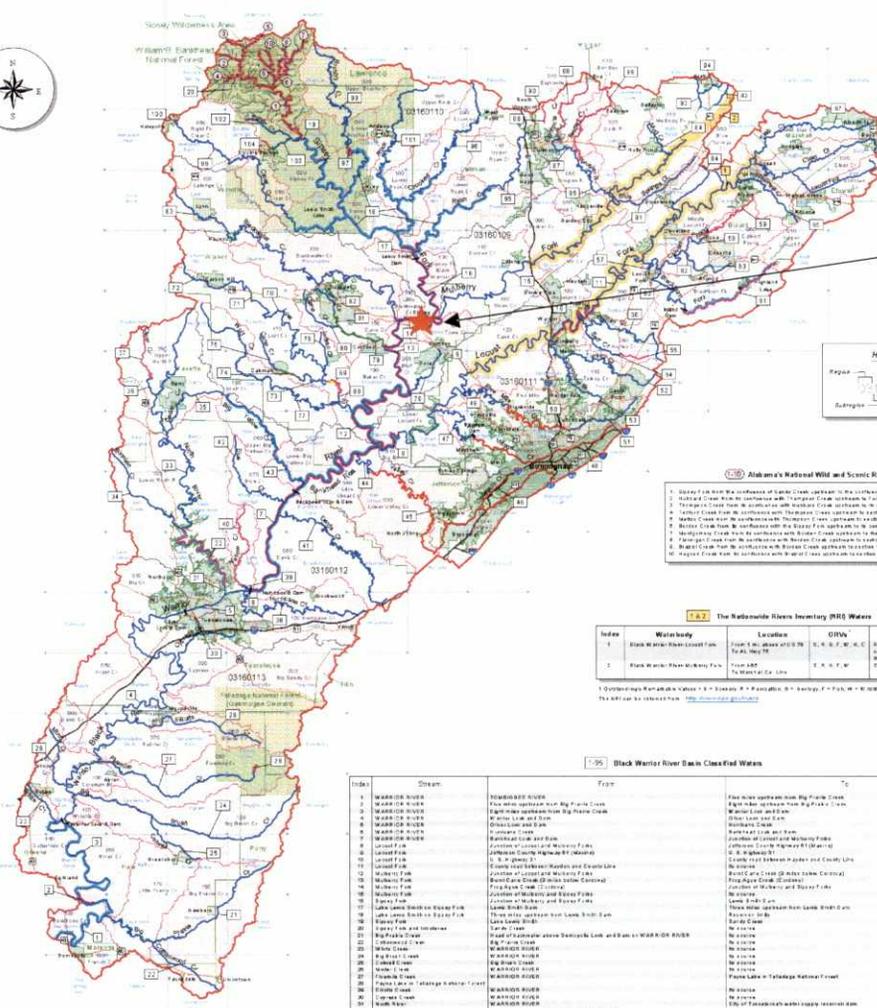


Map No. 2
P-3983
Cumulative Impact Areas

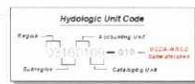


Map No. 3

FINAL Black Warrior River Basin Classified Waters ADEM Water Division-Water Quality Program Chapter 335-8-11 Water Use Classifications for Interstate and Intrastate Waters Effective Date: 01/12/2001



USGS Catalog No.	Name	Code	ACEM Waters No.
33000101	Alabama	10000	10000
33000102	Alabama	10000	10000
33000103	Alabama	10000	10000
33000104	Alabama	10000	10000
33000105	Alabama	10000	10000
33000106	Alabama	10000	10000
33000107	Alabama	10000	10000
33000108	Alabama	10000	10000
33000109	Alabama	10000	10000
33000110	Alabama	10000	10000
33000111	Alabama	10000	10000
33000112	Alabama	10000	10000
33000113	Alabama	10000	10000
33000114	Alabama	10000	10000
33000115	Alabama	10000	10000
33000116	Alabama	10000	10000
33000117	Alabama	10000	10000
33000118	Alabama	10000	10000
33000119	Alabama	10000	10000
33000120	Alabama	10000	10000
33000121	Alabama	10000	10000
33000122	Alabama	10000	10000
33000123	Alabama	10000	10000
33000124	Alabama	10000	10000
33000125	Alabama	10000	10000
33000126	Alabama	10000	10000
33000127	Alabama	10000	10000
33000128	Alabama	10000	10000
33000129	Alabama	10000	10000
33000130	Alabama	10000	10000
33000131	Alabama	10000	10000
33000132	Alabama	10000	10000
33000133	Alabama	10000	10000
33000134	Alabama	10000	10000
33000135	Alabama	10000	10000
33000136	Alabama	10000	10000
33000137	Alabama	10000	10000
33000138	Alabama	10000	10000
33000139	Alabama	10000	10000
33000140	Alabama	10000	10000
33000141	Alabama	10000	10000
33000142	Alabama	10000	10000
33000143	Alabama	10000	10000
33000144	Alabama	10000	10000
33000145	Alabama	10000	10000
33000146	Alabama	10000	10000
33000147	Alabama	10000	10000
33000148	Alabama	10000	10000
33000149	Alabama	10000	10000
33000150	Alabama	10000	10000
33000151	Alabama	10000	10000
33000152	Alabama	10000	10000
33000153	Alabama	10000	10000
33000154	Alabama	10000	10000
33000155	Alabama	10000	10000
33000156	Alabama	10000	10000
33000157	Alabama	10000	10000
33000158	Alabama	10000	10000
33000159	Alabama	10000	10000
33000160	Alabama	10000	10000
33000161	Alabama	10000	10000
33000162	Alabama	10000	10000
33000163	Alabama	10000	10000
33000164	Alabama	10000	10000
33000165	Alabama	10000	10000
33000166	Alabama	10000	10000
33000167	Alabama	10000	10000
33000168	Alabama	10000	10000
33000169	Alabama	10000	10000
33000170	Alabama	10000	10000
33000171	Alabama	10000	10000
33000172	Alabama	10000	10000
33000173	Alabama	10000	10000
33000174	Alabama	10000	10000
33000175	Alabama	10000	10000
33000176	Alabama	10000	10000
33000177	Alabama	10000	10000
33000178	Alabama	10000	10000
33000179	Alabama	10000	10000
33000180	Alabama	10000	10000
33000181	Alabama	10000	10000
33000182	Alabama	10000	10000
33000183	Alabama	10000	10000
33000184	Alabama	10000	10000
33000185	Alabama	10000	10000
33000186	Alabama	10000	10000
33000187	Alabama	10000	10000
33000188	Alabama	10000	10000
33000189	Alabama	10000	10000
33000190	Alabama	10000	10000
33000191	Alabama	10000	10000
33000192	Alabama	10000	10000
33000193	Alabama	10000	10000
33000194	Alabama	10000	10000
33000195	Alabama	10000	10000
33000196	Alabama	10000	10000
33000197	Alabama	10000	10000
33000198	Alabama	10000	10000
33000199	Alabama	10000	10000
33000200	Alabama	10000	10000



Alabama's National Wild and Scenic River Designation

1. Black Warrior River National Wild and Scenic River

2. Tallapoosa River National Wild and Scenic River

3. Tallapoosa River National Wild and Scenic River

4. Tallapoosa River National Wild and Scenic River

5. Tallapoosa River National Wild and Scenic River

6. Tallapoosa River National Wild and Scenic River

7. Tallapoosa River National Wild and Scenic River

8. Tallapoosa River National Wild and Scenic River

9. Tallapoosa River National Wild and Scenic River

10. Tallapoosa River National Wild and Scenic River

4.2 The Nationwide Rivers Inventory (NRI) Waters

Index	Waterbody	Location	ORW	Comments
1	Black Warrior River	From the source of the river to the mouth of the river in the Gulf of Mexico	N, S, E, W, M, A, C	Partially designated as a National Wild and Scenic River
2	Black Warrior River	From the source of the river to the mouth of the river in the Gulf of Mexico	N, S, E, W, M, A, C	Partially designated as a National Wild and Scenic River

3.6 Black Warrior River Basin Classified Waters

Index	Stream	From	To	Classification
1	Black Warrior River	Headwaters	Headwaters	Class 1
2	Black Warrior River	Headwaters	Headwaters	Class 1
3	Black Warrior River	Headwaters	Headwaters	Class 1
4	Black Warrior River	Headwaters	Headwaters	Class 1
5	Black Warrior River	Headwaters	Headwaters	Class 1
6	Black Warrior River	Headwaters	Headwaters	Class 1
7	Black Warrior River	Headwaters	Headwaters	Class 1
8	Black Warrior River	Headwaters	Headwaters	Class 1
9	Black Warrior River	Headwaters	Headwaters	Class 1
10	Black Warrior River	Headwaters	Headwaters	Class 1
11	Black Warrior River	Headwaters	Headwaters	Class 1
12	Black Warrior River	Headwaters	Headwaters	Class 1
13	Black Warrior River	Headwaters	Headwaters	Class 1
14	Black Warrior River	Headwaters	Headwaters	Class 1
15	Black Warrior River	Headwaters	Headwaters	Class 1
16	Black Warrior River	Headwaters	Headwaters	Class 1
17	Black Warrior River	Headwaters	Headwaters	Class 1
18	Black Warrior River	Headwaters	Headwaters	Class 1
19	Black Warrior River	Headwaters	Headwaters	Class 1
20	Black Warrior River	Headwaters	Headwaters	Class 1
21	Black Warrior River	Headwaters	Headwaters	Class 1
22	Black Warrior River	Headwaters	Headwaters	Class 1
23	Black Warrior River	Headwaters	Headwaters	Class 1
24	Black Warrior River	Headwaters	Headwaters	Class 1
25	Black Warrior River	Headwaters	Headwaters	Class 1
26	Black Warrior River	Headwaters	Headwaters	Class 1
27	Black Warrior River	Headwaters	Headwaters	Class 1
28	Black Warrior River	Headwaters	Headwaters	Class 1
29	Black Warrior River	Headwaters	Headwaters	Class 1
30	Black Warrior River	Headwaters	Headwaters	Class 1
31	Black Warrior River	Headwaters	Headwaters	Class 1
32	Black Warrior River	Headwaters	Headwaters	Class 1
33	Black Warrior River	Headwaters	Headwaters	Class 1
34	Black Warrior River	Headwaters	Headwaters	Class 1
35	Black Warrior River	Headwaters	Headwaters	Class 1
36	Black Warrior River	Headwaters	Headwaters	Class 1
37	Black Warrior River	Headwaters	Headwaters	Class 1
38	Black Warrior River	Headwaters	Headwaters	Class 1
39	Black Warrior River	Headwaters	Headwaters	Class 1
40	Black Warrior River	Headwaters	Headwaters	Class 1
41	Black Warrior River	Headwaters	Headwaters	Class 1
42	Black Warrior River	Headwaters	Headwaters	Class 1
43	Black Warrior River	Headwaters	Headwaters	Class 1
44	Black Warrior River	Headwaters	Headwaters	Class 1
45	Black Warrior River	Headwaters	Headwaters	Class 1
46	Black Warrior River	Headwaters	Headwaters	Class 1
47	Black Warrior River	Headwaters	Headwaters	Class 1
48	Black Warrior River	Headwaters	Headwaters	Class 1
49	Black Warrior River	Headwaters	Headwaters	Class 1
50	Black Warrior River	Headwaters	Headwaters	Class 1
51	Black Warrior River	Headwaters	Headwaters	Class 1
52	Black Warrior River	Headwaters	Headwaters	Class 1
53	Black Warrior River	Headwaters	Headwaters	Class 1
54	Black Warrior River	Headwaters	Headwaters	Class 1
55	Black Warrior River	Headwaters	Headwaters	Class 1
56	Black Warrior River	Headwaters	Headwaters	Class 1
57	Black Warrior River	Headwaters	Headwaters	Class 1
58	Black Warrior River	Headwaters	Headwaters	Class 1
59	Black Warrior River	Headwaters	Headwaters	Class 1
60	Black Warrior River	Headwaters	Headwaters	Class 1
61	Black Warrior River	Headwaters	Headwaters	Class 1
62	Black Warrior River	Headwaters	Headwaters	Class 1
63	Black Warrior River	Headwaters	Headwaters	Class 1
64	Black Warrior River	Headwaters	Headwaters	Class 1
65	Black Warrior River	Headwaters	Headwaters	Class 1
66	Black Warrior River	Headwaters	Headwaters	Class 1
67	Black Warrior River	Headwaters	Headwaters	Class 1
68	Black Warrior River	Headwaters	Headwaters	Class 1
69	Black Warrior River	Headwaters	Headwaters	Class 1
70	Black Warrior River	Headwaters	Headwaters	Class 1
71	Black Warrior River	Headwaters	Headwaters	Class 1
72	Black Warrior River	Headwaters	Headwaters	Class 1
73	Black Warrior River	Headwaters	Headwaters	Class 1
74	Black Warrior River	Headwaters	Headwaters	Class 1
75	Black Warrior River	Headwaters	Headwaters	Class 1
76	Black Warrior River	Headwaters	Headwaters	Class 1
77	Black Warrior River	Headwaters	Headwaters	Class 1
78	Black Warrior River	Headwaters	Headwaters	Class 1
79	Black Warrior River	Headwaters	Headwaters	Class 1
80	Black Warrior River	Headwaters	Headwaters	Class 1
81	Black Warrior River	Headwaters	Headwaters	Class 1
82	Black Warrior River	Headwaters	Headwaters	Class 1
83	Black Warrior River	Headwaters	Headwaters	Class 1
84	Black Warrior River	Headwaters	Headwaters	Class 1
85	Black Warrior River	Headwaters	Headwaters	Class 1
86	Black Warrior River	Headwaters	Headwaters	Class 1
87	Black Warrior River	Headwaters	Headwaters	Class 1
88	Black Warrior River	Headwaters	Headwaters	Class 1
89	Black Warrior River	Headwaters	Headwaters	Class 1
90	Black Warrior River	Headwaters	Headwaters	Class 1
91	Black Warrior River	Headwaters	Headwaters	Class 1
92	Black Warrior River	Headwaters	Headwaters	Class 1
93	Black Warrior River	Headwaters	Headwaters	Class 1
94	Black Warrior River	Headwaters	Headwaters	Class 1
95	Black Warrior River	Headwaters	Headwaters	Class 1
96	Black Warrior River	Headwaters	Headwaters	Class 1
97	Black Warrior River	Headwaters	Headwaters	Class 1
98	Black Warrior River	Headwaters	Headwaters	Class 1
99	Black Warrior River	Headwaters	Headwaters	Class 1
100	Black Warrior River	Headwaters	Headwaters	Class 1

Highway Symbols

- Interstate Highway
- U.S. Highway
- State Highway

Other Symbols

- Outstanding National Resources Water (ONRW) Designation
- Public Water Supply (PWS) Use Classification
- Summit (S) Use Classification
- Anticline (A) Use Classification
- National Wetlands Inventory (NWI) Waters
- NWI and Special Stream Designation: Spring Fork and Tributaries
- Special Management Area
- Black Warrior & Tallapoosa National Forests
- Water Sheds
- Primary road with limited access
- Primary Road
- USGS 7.5 Minute Series Quadrangle (1:24,000)

Scale 1:455,000