



STATE OF ALABAMA
SURFACE MINING COMMISSION

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MEMORANDUM

TO: Office of Surface Mining Reclamation and Enforcement

Alabama Department of Environmental Management

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

Shelby County Commission

U.S. Fish & Wildlife Service

Mr. Keith Guyse, Fish & Game Division

FROM: JOHNATHAN E. HALL, DIRECTOR

RE: **PERMANENT PROGRAM PERMIT FOR:**

Permit P-3992-58-23-S (Murry Creek Mine No. 2) Jesse Creek Mining, LLC

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.

/mw

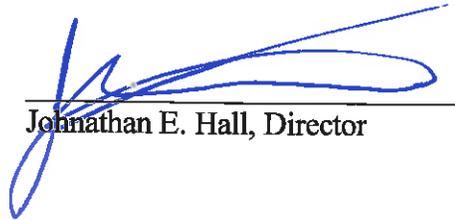
3. Surface coal mining operations are restricted to those areas for which sufficient bond has been posted with ASMC. On the date of issuance of this permit, bond was posted only for increment 1 consisting of 54 acres and increment 2 consisting of 39 acres as defined on the permit map.
4. No mining disturbance 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. Prior to conducting any mining activities the permittee must flag all waters of the U. S. including a 50 foot buffer in a different color than the permit boundary flagging, within the Murry Creek Mine No. 2 project area.

11. The permittee must submit to ASMC an approved USACE permit concurring with project activities prior to disturbing within the waters of the U. S. or the 50 foot buffer area.
12. The permittee must conduct all tree clearing activities prior to August 4, 2019 for Murry Creek Mine No. 2. If tree clearing cannot be completed by August 4, 2019 a new acoustic survey shall be conducted and submitted to FWS for approval or limit tree removal to October 15 – March 31.

ISSUANCE DATE: July 26, 2018

EFFECTIVE DATE: July 26, 2018

EXPIRATION DATE: July 25, 2023



Johnathan E. Hall, Director

FINDINGS

PERMIT NO.: P-3992-58-23-SPAGE 1 OF 4

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 880-X-3 or 880-X-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).

FINDINGS

PERMIT NO.: P-3992-58-23-SPAGE 2 OF 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. For a proposed remining 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.
12. Surface coal mining and reclamation operations will not adversely affect a cemetery.
13. 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).
14. 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.
15. 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.
16. 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.
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 (NRHP). MRS Consultants, LLC conducted two Phase I Cultural Resource Surveys on August 1 and 28-31, 2017 for approximately 95 acres and 381 acres respectively. As a result of the surveys one isolated find was found within the survey area boundaries. The isolated find was not culturally significant and does not warrant inclusion into the Alabama State Site File. The survey area was mostly moderately to steeply sloped upland terrain and the remaining areas are significantly disturbed due to past logging activities, surface mining, and methane gas exploration and extraction. No cemeteries or historic structures were found at or in close proximity to the survey area, therefore MRS recommends the project area be cleared in regards to cultural resources. No significant cultural resources will be affected by project activities. By a letter dated September 28, 2017 the Alabama Historic Commission (AHC), Re: AHC 15-0053, based on a cultural

FINDINGS

PERMIT NO.: P-3992-58-23-SPAGE 3 OF 4

resource assessment conducted for the above referenced project, determined that the project activities will have no adverse effect on cultural resources eligible for or listed on the NRHP. Therefore AHC concurs with the project activities. 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. In a habitat assessment performed by McGehee Engineering Corp (MEC), it was determined that there may be areas of potential summer roosting habitat for the endangered Indiana bat (*Myotis sodalis*) and Northern Long-eared bat (*Myotis septentrionalis*) that may exist on the Jesse Creek Mining, LLC - Murry Creek Mine site. An Acoustic Presence/Absence Survey was performed on July 31st, through August 4th, 2017 by MEC in accordance with the US Fish and Wildlife Service (FWS) approved plan. The findings from the Acoustic Presence/Absence Survey indicate that the presence of Indiana and Northern Long-eared bats are unlikely. By comments dated September 11, 2017 the US Fish and Wildlife Service concur with the findings that the proposed project is not likely to adversely affect the Indiana bat or Northern Long-eared bat.

In a letter dated July 31, 2017 the Alabama Department of Conservation and Natural Resources (ADCNR) states the closest sensitive species as occurring approximately 2.1 miles from the subject site.

The US Army Corps of Engineers (USACE) issued a Preliminary Jurisdictional Determination-Project Number SAM-2014-01052-CMS on November 21, 2017 for Murry Creek Mine No. 2. The Alabama Surface Mining Commission 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.

FINDINGS

PERMIT NO.: P-3992-58-23-SPAGE 4 OF 4

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

DATE: July 26, 2018


Mark A. Woodley
Permit Manger

/mw

cc: I & E, Permit File

LEGAL DESCRIPTION

P-3992-58-23-S

NE/NE, SE/NE, SW/NE, SE/NW, NE/SW, NW/SE, NE/SE OF SECTION 13, TOWNSHIP 21 SOUTH, RANGE 4 WEST, NW/NW, SW/NW, NW/SW OF SECTION 18, TOWNSHIP 21 SOUTH, RANGE 3 WEST, SHELBY COUNTY, ALABAMA.

**Cumulative Hydrologic Impact Assessment
Jesse Creek Mining, LLC
Murry Creek Mine No. 2
ASMC P-3992**

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CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Jesse Creek Mining, LLC
Murry Creek Mine No. 2
ASMC Permit Number P-3992
NPDES Permit Number AL0069108

As required under Federal Public Law 95-87, Section 510(b)(3), the Alabama Surface Mining Commission (ASMC) must find in writing the following 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 Jesse Creek Mining, LLC Murry Creek Mine No. 2 (ASMC Permit No. P-3992) is for a surface coal mining and highwall mining operation encompassing a total of 120 acres in Shelby County, Alabama. The mine site includes 55 acres of surface mining and 65 acres of haul/access roads, impoundments, stockpiles, equipment storage areas and diversion ditches.

The mine site is located in part of Section 13, Township 21 South, Range 4 West and part of Section 18, Township 21 South, Range 3 West in Shelby County, Alabama as seen from the 1979 Pea Ridge, Alabama USGS 7.5 minute quadrangle.

II. CUMULATIVE IMPACT AREA (CIA)

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

The permit area is located contiguous to the eastern side of the Jesse Creek Mining, LLC Murry Creek Mine (ASMC P-3985). This permit is in close proximity to the Yeshic, LLC Yeshic Mine No. 2 (ASMC P-3940), the Jesse Creek Mining, LLC Gholson Mine (ASMC P-3663) and the Jesse Creek Mining, LLC Helena Mine (ASMC P-3916). Other permits within the vicinity and CIA include part of the Jesse Creek Mining, LLC Gurnee Mine (ASMC P-3978), part of the Twin Pines II, LLC SEGCO Mine No. 1 (ASMC P-3901) and part of the Timcoaland, Inc. Montevallo Mine (ASMC P-3273). See Figure 1 for location of these permits. An informational table is shown in Table 1.

The CIA for surface water for Permit P-3992 has been defined as the area that encompasses the Murry Creek-Piney Woods Creek 12-digit hydrologic unit code (HUC) watershed (031502020205). This watershed includes Murry Creek, Piney Woods Creek, Jesse Creek,

Eddings Creek and Clark Creek. Clark Creek is a small creek just east of P-3940 that flows into Murry Creek. Eddings Creek is south of P-3940 and also flows into Murry Creek. Murry Creek flows into Piney Woods Creek, which in turn flows into the Cahaba River approximately 1.8 miles downstream. See Figure 2 for the surface water CIA.

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 mining area. The estimate of solute concentrations are given in the Probably Hydrologic Consequences (PHC). For this permit, the critical evaluation point is the Jesse Creek Mining, LLC Gurnee Mine (ASMC P-3978) SW-10 sampling site on Piney Woods Creek. The surface water monitoring site SW-10 receives drainage from all the permits within this 12-digit HUC watershed, which encompasses approximately 13,165 acres. The baseline condition for the general area comes from the data in P-3663. This location of SW-10 is shown in Figure 2.

The CIA for groundwater for this permit is limited to the permit area. 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 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 limited areal extent of the aquifer system as well as underground works that exist within and adjacent to the P-3992 area.

A. Geologic/Hydrogeologic Information

i. Geology

The P-3992 permit area is located in the Cahaba Coal Field of the Valley and Ridge Province. In this region of Alabama, the uppermost bedrock is Pennsylvanian in age and consists predominantly of alternating layers of gray sandstone, conglomerate, siltstone and shale with beds of coal and underclay of the Pottsville Formation (Hydrologic Assessment, Eastern Coal Province Area 23, Alabama).

Generally alternating sequences of gray sandstone, conglomerate, siltstone, shale and underclay separate the coalfields of the Cahaba Coal Field. This mine site will remove the Gholson and Clark coal seams. According to "The Geological Survey Bulletin 1182-B, Geology and Coal Resources of the Coal-Bearing Rocks in Alabama", in the Cahaba Coal Field the boundary between Early and Middle Pennsylvanian is provisionally placed at the Yeshic coal bed, which is located above the Gholson and Clark seams.

This permit area is located in the Dry Creek Basin, which is bounded on the east by the Helena thrust fault, to the south by the Piney Woods anticline, and to the north by the Cahaba River.

There are several small abandoned underground mines adjacent to the permit area located in the Coke and Helena seams. This mining operation will not intercept these abandoned underground mines.

ii. Potentially Acid- and Toxic-Forming Materials

Samples of drill cuttings from 1 overburden hole specific for this permit were collected by personnel of Jesse Creek Mining every 5 ft. or change in lithology to at least 5 feet below the Clark coal seam for analysis of potentially acid- and toxic- forming properties. For this sample, overburden analyses was 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 (CaCO₃) equivalent of at least 0.0 tons per 1,000 tons of material (T/KT).

The abandoned refuse disposal area from the SEGCO Mine No. 2 underground mine is within this permit area. This existing coarse refuse material is from the Helena coal seam. The material is to be taken to Coarse Refuse Disposal Area No. 1. Samples of this material were taken and the results are shown in the Coarse Refuse Disposal Area No. 1 Design Plans. The two sample sites show an overall acid base account of -1.0 tons per 1,000 tons of material CaCO₃ equivalent. This is considered potentially acid forming. The Coarse Refuse Disposal Area No. 1 Design Plans also include a monitoring/sampling schedule to determine if neutralization of the waste produce should occur in lifts as the refuse disposal area is constructed. This includes liming requirements based on the formula:

$$T = \frac{(-AB - 5) \times 5,277}{1,000}$$

Where:

T = tons of agricultural lime per acre

AB = Acid-Base Account (when less than -5)

5,227 = tons of coarse refuse in one acre 2 feet thick

1,000 = 1,000 tons of CaCO₃ equivalent

As stated earlier 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 0.0 tons of material (T/KT). This calculation uses a -5 threshold for acid-and toxic-forming materials.

iii. Surface Water

All water moves through the hydrologic cycle. In Alabama, precipitation averages 55 inches per year which either soaks into the ground or runs along the surface as runoff to streams and lakes (on average of 22 inches per year) and plants absorb some of the water which returns to the atmosphere as transpiration (on average of 33 inches/year). Seventeen major streams flow through Alabama and approximately 15 percent of all

surface water flowing through the lower 48 states flows through Alabama (www.gsa.alabama.gov/gsa/water/water-information).

This permit area is located in the Cahaba River Basin. It is drained by Piney Woods Creek to the north and Murry Creek to the south. Murry Creek drains into Piney Woods Creek which empties into the Cahaba River west of the permit site. There are three surface water monitoring sites for this permit. Surface water monitoring station SW-14 is located downstream of the permit area on Piney Woods Creek and drains approximately 2,067 acres (3.23 square miles). Surface water monitoring station SW-5 is located downstream on Murry Creek and drains approximately 4,378 acres (6.84 square miles). Surface water monitoring station SW-15 is located upstream on Piney Woods Creek and drains approximately 804 acres (1.26 square miles). The data collected from SW-14 was used for water quality projections.

The Alabama Department of Environmental Management (ADEM) has classified Murry Creek and Piney Woods Creek as “Fish and Wildlife.” According to ADEM Admin. Code r. 335-6-11-.01(2), “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.”

ADEM Admin. Code r. 335-6-11-.01(5) states “...Those segments which are not included by name will be considered to be acceptable for a ‘Fish and Wildlife’ classification unless it can be demonstrated that such a generalizations is inappropriate in specific instances.” The unnamed tributaries to Murry Creek and Piney Woods Creek have a designated use classification of Fish and Wildlife. There are no Total Maximum Daily Load (TMDL) limits on Murry Creek or Piney Woods Creek.

The Environmental Protection Agency has approved a TMDL for a stretch of the Cahaba River at that includes the location where Piney Woods Creek empties into it for pathogens (E. coli), siltation (habitat alteration), and nutrients. ADEM issued National Pollutant Discharge Elimination System (NPDES) permit AL0069108 on March 31, 2015 with an effective date of April 1, 2015. The June 27, 2018 modified NPDES permit contains a permit rationale that indicates permit limitations take into account the results of the TMDL for siltation in the Cahaba River Watershed. The ADEM draft NPDES permit rationale also states that monitoring for nutrient related parameters are imposed on all outfalls during the months of April through October due to the nutrient TMDL for the Cahaba River watershed. The ADEM draft NPDES permit rationale also states “If the requirements of the proposed permit and pollution abatement plan are fully implemented, there is reasonable assurance that the facility will not discharge pollutants at levels that will cause or contribute to a violation of the approved TMDLs set forth by the Alabama Department of Environmental Management.”

To characterize the existing quality and quantity of water within the area, baseline data were obtained and submitted in the permit application. These include two sites on Piney Woods Creek (upstream and downstream), and one site on Murry Creek (downstream). At least six months of consecutive data was submitted, including two suites of metals analysis at each site. Table 2 at the end of this assessment presents the baseline data. Tables 3 and 3a present the metals baseline data.

During mining, five proposed sediment control structures with five point source discharges will be used under ADEM NPDES permit number AL0069108. The purpose of sediment basins is to allow sediment to settle and not discharge into receiving streams. All sediment basins are proposed as temporary structures.

iv. Ground Water

Alabama has 20 major aquifers that supply water from the surface to depths of up to 3000 feet. While on average Alabama receives approximately 55 inches of rainfall per year, only 6-7 inches on average move underground to become ground water recharge. There is approximately 586 trillion gallons of water (both surface and ground), with 553 trillion gallons of that water stored in underground aquifers. Many large cities and smaller towns utilize groundwater for water needs, especially in south Alabama. While fresh water in some areas of Alabama extends to the depths of 3000 feet or more, in a few areas fresh water extends only to 150 feet below the surface. (www.gsa.alabama.gov/gsa/water/water-information).

According to the “Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama, Area 4” by the U.S. Geological Survey, Water-Resources Investigations Report 88-4133, large water supplies are generally not available from the Pottsville Formation and there are no municipal wells in Pottsville Formation within the study area. The Pottsville Formation is defined by the “Regional Analysis of the Black Creek-Cobb Coalbed Methane Target Interval, Black Warrior Alabama, USGS Bulletin 145” as a low yielding, fractured aquifer with water occurring in coal seams, along bedding planes, joints, fractures and some sandstone.

Domestic Wells

A well inventory of the permit area concluded there are no groundwater users within one-half mile of the permit area.

Company Installed Wells

No groundwater baseline monitoring was conducted for this permit application. The first reason being there are no groundwater users within the vicinity. Additionally, the dip of the coal seam is between 15 and 25 degrees south and southeast. Published information shows the aquifer system in this area as fractured and not connected.

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 cumulative hydrologic impact assessment (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 permit area.

A. Potentially Acid- and Toxic-Forming Materials

Laboratory analyses of the bedrock overlying the Clark Coal seam show a positive acid-base account. As stated earlier 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 0.0 tons per 1,000 tons of material (T/KT). In the analysis submitted by the permittee the net neutralization potential at the Murry Creek Mine No. 2 contains an excess of +15.13 (tons CaCO₃/1000 tons overburden) and an acid-base account of +14.56 (tons CaCO₃/1000 tons overburden) based on the overburden analysis from drill hole JC16-17.

The two coarse refuse samples show an average neutralization potential of +3.37 (tons CaCO₃/1000 tons overburden) and an acid-base account of -1.07 (tons CaCO₃/1000 tons overburden). The average pH of the coarse refuse samples is 3.5 s.u. Based on the acid-base account, pH and sulfur percentage; the coarse refuse is considered potentially acid- and toxic- forming material and will need to be handled as outlined in the Coarse Refuse Disposal No. 1 Design Plans.

B. Surface Water

Based on laboratory analysis of the samples collected at surface water sites SW-5, SW-14 and SW-15, the surface water is alkaline. The samples also contain low TSS, iron and manganese. Metals analysis was included in the permit application for these surface water sites. All metals were Below Measurable Limits (BML) with the exception of arsenic, chromium, copper and lead upstream on Piney Woods Creek; copper, selenium and silver downstream on Piney Woods Creek and nickel and silver upstream on Murry Creek. This information is presented in Tables 3 and 3a.

A critical evaluation point was chosen to evaluate the new concentration of solutes that are not likely to precipitate. Baseline or background concentrations of these solutes are needed for the general area, as well as an estimate of solute concentrations for the proposed area (given in the PHC). For this permit, the evaluation point is the Jesse Creek Mining, LLC Gurnee Mine (ASMC P-3978) SW-10 site on Piney Woods Creek. A worksheet showing the results of the critical point evaluation is shown in Table 4.

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 have been designed to retain the runoff to allow sediment to settle out prior to discharging. Effluent from the sediment basins will be monitored by the permittee in accordance with their NPDES permit requirements issued by the ADEM. The effluent will be chemically treated, if necessary, in accordance with the NPDES permit. The basins will be monitored through final bond release in order to characterize and document any effects mining may have on the surface-water hydrologic balance. The basins are all proposed as temporary water impoundments.

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

- Baseline surface water quality
- Estimated impact during mining
- Size of the permit area compared to the size of the watershed
- 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. The NPDES maximum and average limitations set forth by ADEM for this mine site can be seen on their NPDES permit. The NPDES permit can be viewed at the ADEM website under the eFile system using permit number AL0069108.

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 at surface water monitoring site SW-14.

C. Ground Water

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. The main aquifer in this area is a Pottsville sandstone unit located below the Clark Coal seam. The extensive underground mining in the area has most likely affected shallow groundwater movement. According to the permit application, regional groundwater movement is in the southeast direction. Due to the lack of any users and an approval of a groundwater waiver, a cumulative impact area for groundwater was not outlined; however, as stated earlier it is defined as the permit area.

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.

D. Historical and Active Coal Mines

The presence of the active permits within and adjacent to the Murry Creek Mine No. 2 are not expected to have impacts to the hydrologic balance in this area. The baseline water quality analysis shows little impact to receiving streams in this area with mining having already occurred, and ongoing. Additional water quality parameters will be monitored during active mining and post-mining.

IV. CONCLUSION

The assessment of probable cumulative impacts of the Jesse Creek Mining, Inc. Murry Creek Mine No. 2 (P-3992) finds the proposed operations have been designed to prevent material damage to the hydrologic balance outside the permit area.

V. TABLES AND FIGURES

| | |
|-----------|--|
| Table 1 | Mining Operations in the Cumulative Impact Area |
| Table 2 | Ranges/Averages of Surface-Water Quality/Quantity |
| Table 3 | Additional Surface Water Baseline Data High Flow Metals Data |
| Table 3a. | Additional Surface Water Baseline Data Low Flow Metals Data |
| Table 4 | Critical Point Evaluation 4113006 (SW-6) |
| Table 5 | Estimate of Post-Mining, Average Event Surface Water Quality |
| Figure 1 | P-3992 Permit Area with Adjacent and Nearby Permits |
| Figure 2 | P-3992 Cumulative Impact Area |

Table 1
Mining Operations in the Cumulative Impact Area
P-3992

| Permit No. | Permittee | Permit Name | Date Issued | Acres* | Description | Coal Seam(s) |
|-------------------|-------------------------|--------------------|--------------------|---------------|--------------------------------------|---|
| P-3985 | Jesse Creek Mining, LLC | Murry Creek Mine | 09/01/2016 | 241 | Surface Mine, Active operations | Gholson Bed Clark Bed |
| P-3978 | Jesse Creek Mining, LLC | Gurnee Mine | 05/06/2014 | 280 | Surface Mine, Reclamation activities | Gholson Bed Clark Bed |
| P-3940 | Yeshic, LLC | Yeshic Mine No. 2 | 05/28/2010 | 247 | Surface Mine, Reclamation activities | Yeshic Bed |
| P-3914 | Yeshic, LLC | Yeshic Mine | 06/26/2009 | 127 | Surface Mine, Reclaimed | Yeshic Bed |
| P-3901 | Twin Pines II, LLC | Segco Mine No. 1 | 02/07/2008 | 923 | Surface Mine, Reclamation activities | Helena Bed Thompson Beds |
| P-3663 | Jesse Creek Mining, LLC | Gholson Mine | 05/24/1991 | 744 | Underground Mine, Active operations | Gholson Bed Coke Bed Thompson Beds Jones Bed |
| P-3273 | Timcoaland, Inc. | Montevallo Mine | 03/30/1983 | 226 | Surface Mine, Reclaimed | Montevallo Bed |

*Acres at Issuance of P-3992

Table 2
Ranges/Averages of Surface-Water Quality/Quantity Stream Points
P-3992

| Parameter | SW-5 DS Murry Creek | SW-14 DS Piney Woods Creek | SW-15 US Piney Woods Creek |
|---|--------------------------------|---------------------------------------|---------------------------------------|
| Discharge Rate (cfs) | 0.7650 – 24.4789 (9.961) | 0.3188 – 7.650 (2.88) | 0.5126 – 15.3001 (6.69) |
| Field pH (S. U.) | 6.46 – 8.49 | 6.83 – 8.26 | 6.35 – 8.08 |
| Total Suspended Solids (mg/L) | 3 – 43 (10.8) | 1 – 15 (4.3) | 1 – 21 (8.5) |
| Total Iron (mg/L) | 0.08 – 2.55 (0.57) | 0.11 – 0.57 (0.37) | 1.34 – 2.14 (1.72) |
| Total Manganese (mg/L) | 0.03 – 1.2 (0.29) | *BML – 0.32 (0.15) | 0.22 – 0.33 (0.37) |
| Specific Conductivity @ 25 °C (μ mhos/cm) | 259 – 1021 (625.4) | 182 – 1196 (444.3) | 207 – 574 (315.5) |
| Acidity (mg/L) | NA | NA | 3 – 10 (7.0) |
| Alkalinity (mg/L) | NA | NA | 35 – 88 (56.5) |
| Sulfates (mg/L) | NA | NA | 39 – 134 (70) |

Average values are shown in parentheses

Averaged via all data, not seasonally

DS = Downstream

US = Upstream

BML = Below Measurable Limits

*For manganese average, BML was represented as 0.01 mg/l

NA = Not analyzed (quarterly performance monitoring data)

Table 3
Additional Surface Water Baseline Data - High Flow Metals Data
P-3992

| Parameter | SW-5 US Murry Creek 09/16/2016 (24.5 cfs) | SW-14 DS Piney Woods Creek 11/22/2016 (7.65 cfs) | SW-15 US Piney Woods Creek 11/28/2017 (15.3 cfs) |
|------------------|--|---|---|
| Antimony (µg/L) | BML | BML | BML |
| Arsenic (µg/L) | BML | BML | BML |
| Beryllium (µg/L) | BML | BML | BML |
| Cadmium (µg/L) | BML | BML | BML |
| Chromium (µg/L) | BML | BML | 6.67 |
| Copper (µg/L) | BML | BML | 0.93 |
| Lead (µg/L) | BML | BML | BML |
| Nickel (µg/L) | BML | BML | BML |
| Selenium (µg/L) | BML | 2.41 | BML |
| Silver (µg/L) | 1.03 | BML | BML |
| Thallium (µg/L) | BML | BML | BML |
| Zinc (µg/L) | BML | BML | BML |

US = Upstream

DS = Downstream

BML = Below Measurable Limits

Table 3a.
Additional Surface Water Baseline Data - Low Flow Metals Data
P-3992

| Parameter | SW-5 US Murry Creek 12/08/2016 (0.76 cfs) | SW-14 DS Piney Woods Creek 06/21/2016 (0.32 cfs) | SW-15 US Piney Woods Creek 10/04/2014 (0.51 cfs) |
|------------------|--|---|---|
| Antimony (µg/L) | BML | BML | BML |
| Arsenic (µg/L) | BML | BML | 0.51 |
| Beryllium (µg/L) | BML | BML | BML |
| Cadmium (µg/L) | BML | BML | BML |
| Chromium (µg/L) | BML | BML | 2.17 |
| Copper (µg/L) | BML | 1.44 | 1.51 |
| Lead (µg/L) | BML | BML | 0.99 |
| Nickel (µg/L) | 20.42 | BML | BML |
| Selenium (µg/L) | BML | 5.28 | BML |
| Silver (µg/L) | BML | 0.49 | BML |
| Thallium (µg/L) | BML | BML | BML |
| Zinc (µg/L) | BML | BML | BML |

US = Upstream

DS = Downstream

BML = Below Measurable Limits

Table 4
Jesse Creek Mining, LLC P-3992
Critical Point Evaluation SW-2
P-3978 SW-10 Downstream on Piney Woods Creek

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

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

Q_a = average flow from the anticipated mining area

Units

| Standards: | | | |
|-------------------|-------|--------|-------|
| | A_c | 20.569 | sq mi |
| | A_a | 0.1875 | sq mi |
| | Q_a | 5.039 | cfs |
| | Q_c | 24.058 | cfs |

| Variables: | C_g | C_a | Units |
|-------------------|-------|-------|--------------|
| TSS | 4.6 | 4 | mg/L |
| Fe | 0.35 | 0.42 | mg/L |

| Results: | C_{nc} |
|-----------------|-----------|
| TSS | 4.5 mg/L |
| Fe | 0.36 mg/L |

A_c Data from P-3978

A_a Data from P-3992

Q_a Data taken P-3992 PHC

Q_c Data taken P-3978 SW-10 Performance Monitoring

C_g Data taken from P-3978 SW-10 Performance Monitoring

C_a Data taken from P-3992 PHC

Table 5
Estimate of Post-Mining, Average Event Surface-Water Quality at SW-14
P-3992

| Parameter | Estimated Value |
|--|------------------------|
| Flow (cfsm) | 1.56 |
| pH (s.u.) | 7.43 |
| Iron (mg/L) | 0.42 |
| Manganese (mg/L) | 0.14 |
| Specific Conductivity 25 °C (μ mhos/cm) | 329 |

Figure 1
P-3992 Permit Area with Adjacent and Nearby Permits

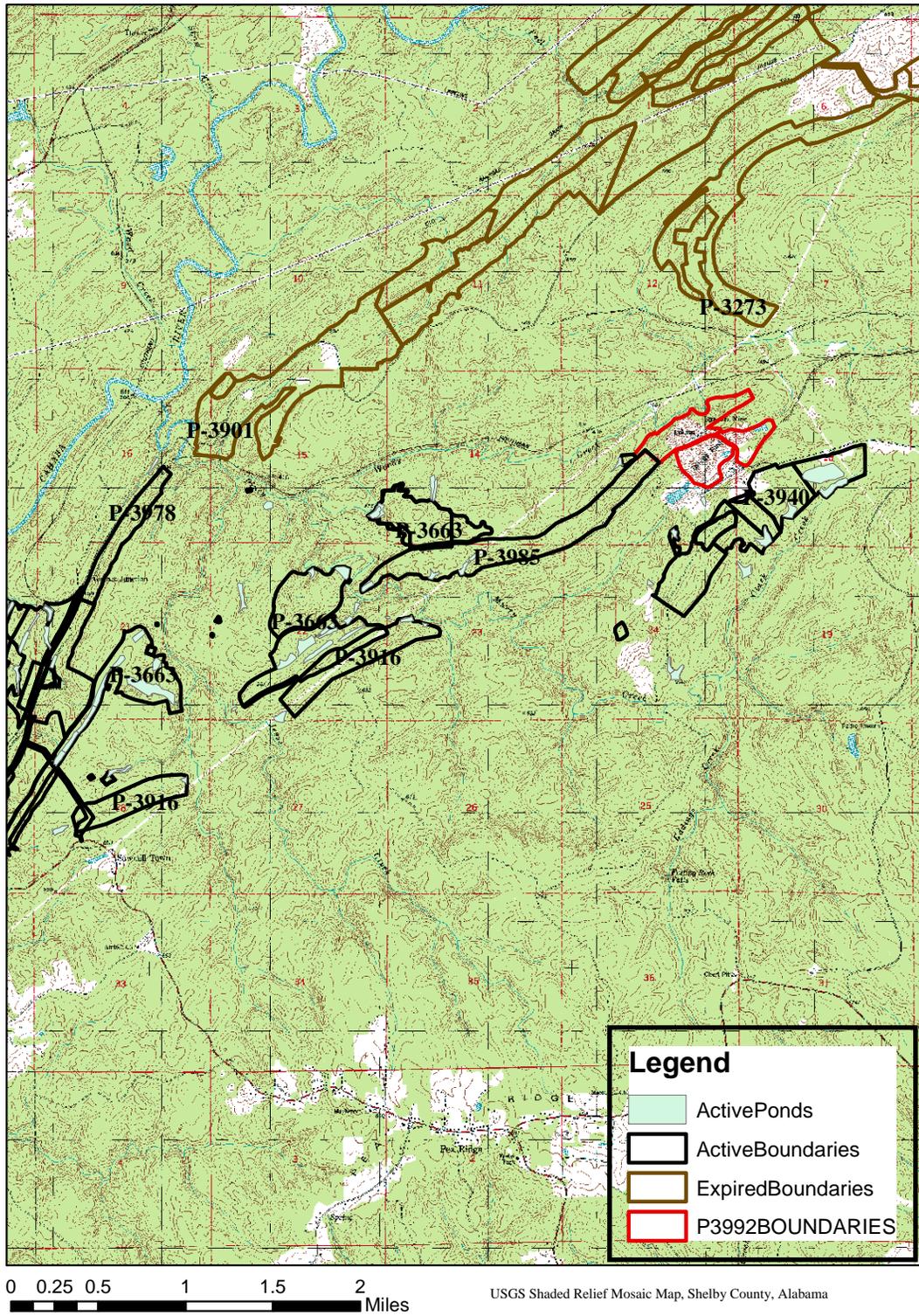
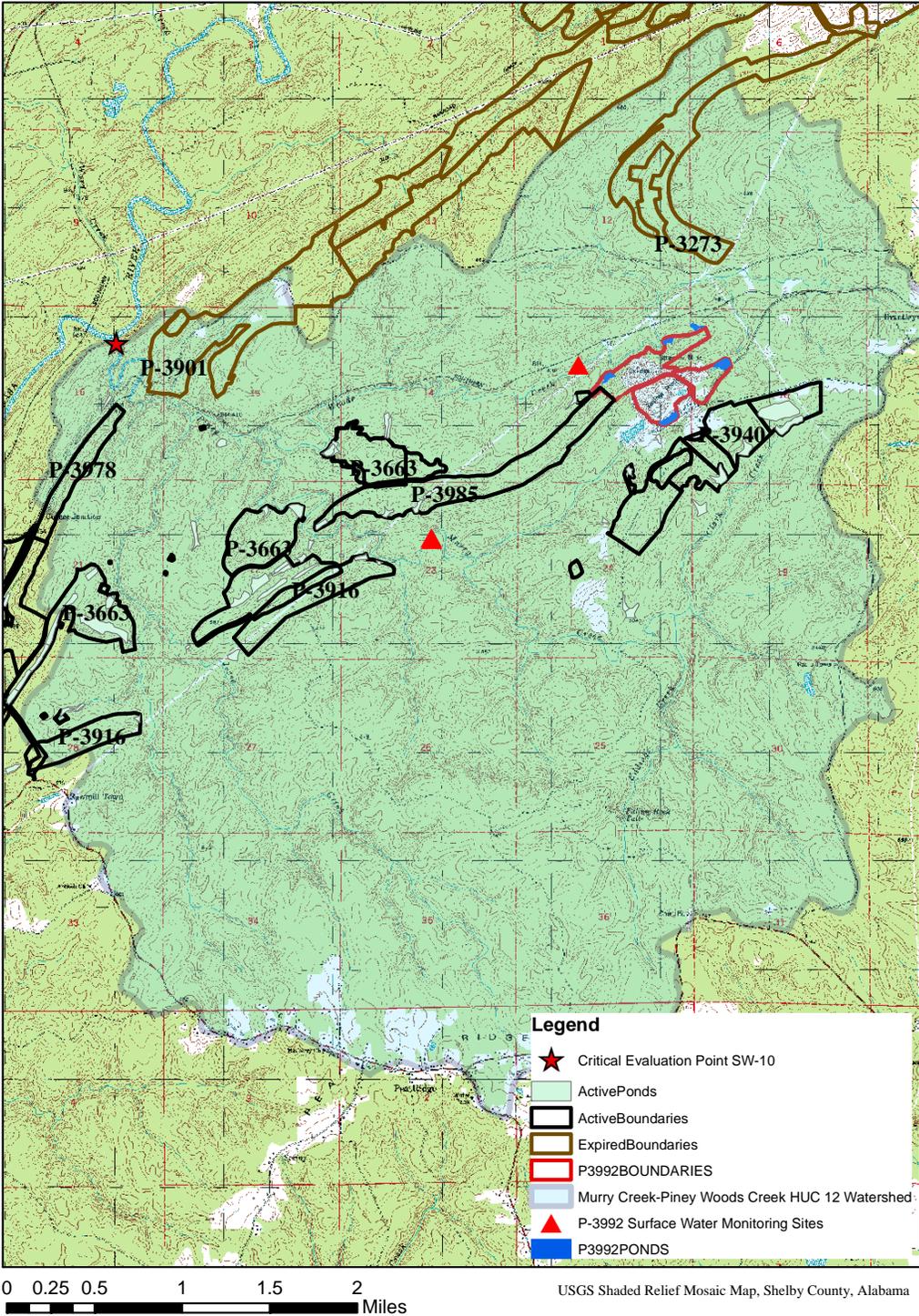


Figure 2
P-3992 Cumulative Impact Area
(HUC 31502020205)



4-2