CEDAR LAKE MINING, INC.
BULL GAP MINE

U. S. ARMY CORPS OF ENGINEERS

NATIONWIDE PERMIT 21

(NWP 21)
NATION WIDE PERMIT # 21

Compensatory MITIGATION PLAN

Prepared by
Delta Natural Resource Services, Inc.
P.O. Box 941
Hartselle, Alabama 35640

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DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, MOBILE
CORPS OF ENGINEERS
BIRMINGHAM FIELD OFFICE
218 SUMMIT PARKWAY, SUITE 222
HOMEWOOD, ALABAMA 35209

REPLY TO
ATTENTION OF

September 7, 2011

Inland Section North
Regulatory Division

SUBJECT: SAM-2010-01439-CHE; Bull Gap Mine

Cedar Lake Mining, Inc.
c/o Task Engineering Management, Inc.
Post Office Box 660548
Birmingham, Alabama 35266

Ladies and Gentlemen:

We have reviewed your application to impact 1.9 acres of wetlands, 3,820 linear feet of intermittent streams, and 3,880 linear feet of ephemeral streams in association with the your proposal to conduct surface coal re-mining activities in unnamed streams near Oneonta, Blount County, Alabama (34.005143,-86.354685). Department of the Army permit authorization is necessary because your project would involve the placement of dredged and/or fill material into waters of the U.S., including wetlands under our regulatory jurisdiction.

Based on the information you provided to us, Nationwide Permit (NWP) 49, Coal Remining Activities (Federal Register, March 12, 2007 Vol. 72, No. 47), authorizes your proposal as depicted on the enclosed drawings dated October 2010. In order for this NWP authorization to be valid, you must ensure that the work is performed in accordance with the General Conditions of Nationwide Permit 49, which can be viewed at our website at www.sam.usace.army.mil/RD/reg, and the following special conditions:

a. The permittee shall implement and abide by the mitigation plan "Compensatory Mitigation Plan" dated January 11, 2011. A status report on the mitigation construction, including as-built drawings, must be submitted to the U.S. Army Corps of Engineers, Mobile District, Regulatory Division, 13 months from the date of permit issuance. Annual status reports on mitigation construction are required until mitigation construction is complete. The Permittee shall implement the mitigation plan on or before March 17, 2013.

b. The permittee shall construct 7,600 linear feet of intermittent streams and associated buffers as compensatory mitigation for the streams impacts of the proposed project. Mitigation monitoring reports will be due annually for 5 years from the final due date of the as-built drawings and final annual mitigation construction status report. All stream monitoring reports must be prepared in accordance with "Appendix D: Stream Mitigation Monitoring Requirements" of the March 2009 document entitled "*Mobile District Compensatory Stream*

Mitigation Standard Operation Procedures and Guidelines," and Regulatory Guidance Letter 06-03. All reports must be submitted to the U.S. Army Corps of Engineers, Mobile District, Regulatory Division and must prominently display the reference number SAM-2010-01439-CHE.

c. The permittee shall construct 1.5 acres of wetlands as compensatory mitigation for wetland impacts of the proposed project. Mitigation monitoring reports will be due annually for 5 years from the final due date of the as-built drawings and final annual mitigation construction status report. All wetland monitoring reports must be prepared in accordance with Regulatory Guidance Letter 06-03. All reports must be submitted to the U.S. Army Corps of Engineers, Mobile District, Regulatory Division and must prominently display the reference number SAM-2010-01439-CHE.

d. The permittee's obligation to provide compensatory mitigation for the stream impacts authorized under this permit shall not be considered complete until the streams constructed as compensatory mitigation for the proposed project meet the all the success criterion of "Table 2" of the "Appendix D: Stream Mitigation Monitoring Requirements" of the March 2009 document entitled "*Mobile District Compensatory Stream Mitigation Standard Operation Procedures and Guidelines*" for 5 consecutive years, and is verified by letter by Mobile District, U.S. Army Corps of Engineers, Regulatory Division.

e. The permittee's responsibility to complete the required compensatory mitigation as set forth in Special Conditions "a," "b," "c," and "d," will not be considered fulfilled until the permittee has demonstrated that the no less than 12,729 stream credits were generated as a result of the compensatory mitigation activities (using the 2009 Mobile District Stream SOP) and receives written verification of mitigation success from the Mobile District, U.S. Army Corps of Engineers, Regulatory Division. If the compensatory mitigation is found to be unsuccessful 6 years after the due date of the as built drawings, the permittee must purchase from a U.S. Army Corps of Engineers approved mitigation bank, 12,729 stream credits.

f. The aquatic resources constructed as compensatory mitigation for work authorized by this permit shall not be made the subject of a future individual or general Department of the Army permit application for fill or other development, except for the purposes of enhancing or restoring the mitigation associated with this project.

g. The permittee shall obtain a Financial Assurance in the amount of $167,000.00 to provide financial assurance for the performance of all of the obligations, covenants, terms, conditions, and agreements required of the Permittee under this permit. The Financial Assurance shall be submitted to the Mobile District, U.S. Army Corps of Engineers for approval prior to being executed, and shall be posted before construction authorized by this permit commences.

h. The permittee shall obtain 0.07 wetland mitigation bank credits from the Big Sandy Mitigation Bank in compliance with the provisions of the bank's mitigation banking instrument. The permittee shall submit documentation of the completed mitigation bank transaction to the Mobile District, U.S. Army Corps of Engineers before construction authorized by this permit commences.

i. You shall comply with all the terms and conditions of the Alabama Department of Environmental Management Section 401 Water Quality Certifications for the Nationwide Permits. This document can be viewed at our website: www.sam.usace.army.mil/rd/reg/nwp/htm for you review and compliance, or at your request a paper copy will be provided to you.

j. If human remains or archaeological resources are encountered during construction, all ground disturbing activities shall cease in the immediate area and the permittee shall immediately (within one business day of discovery) notify the Regulatory Division, Mobile District, U.S. Army Corps of Engineers (Corps) and the Alabama Historical Commission. The permittee shall perform any work required by the Corps in accordance with Section 106 of the National Historic Preservation Act and Corps regulations.

k. The permittee shall not initiate any work authorized under this U.S. Army Corps of Engineers permit prior to obtaining a permit to conduct surface coal mining from the Alabama Surface Mining Commission for the project site.

This verification is valid until the NWP is modified, reissued, or revoked. All of the existing NWPs are scheduled to be modified, reissued, or revoked prior to March 18, 2012. It is incumbent upon the applicant to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued.

Furthermore, if the applicant commences or is under contract to commence this activity before the date that the relevant nationwide permit is modified or revoked, he will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit.

The District Engineer shall be notified promptly in writing at the commencement and within 60 days upon completion of the work. The enclosed form letter(s) may be used for that purpose.

If the scope of work or project locations changes, you are urged to contact this office for a verification of this determination. This letter of authorization does not obviate the necessity to obtain any other Federal, State, or local permits, which may be required.

Nothing in this letter shall be construed as excusing you from compliance with other Federal, State, or local statutes, ordinances, or regulations which may affect this work.

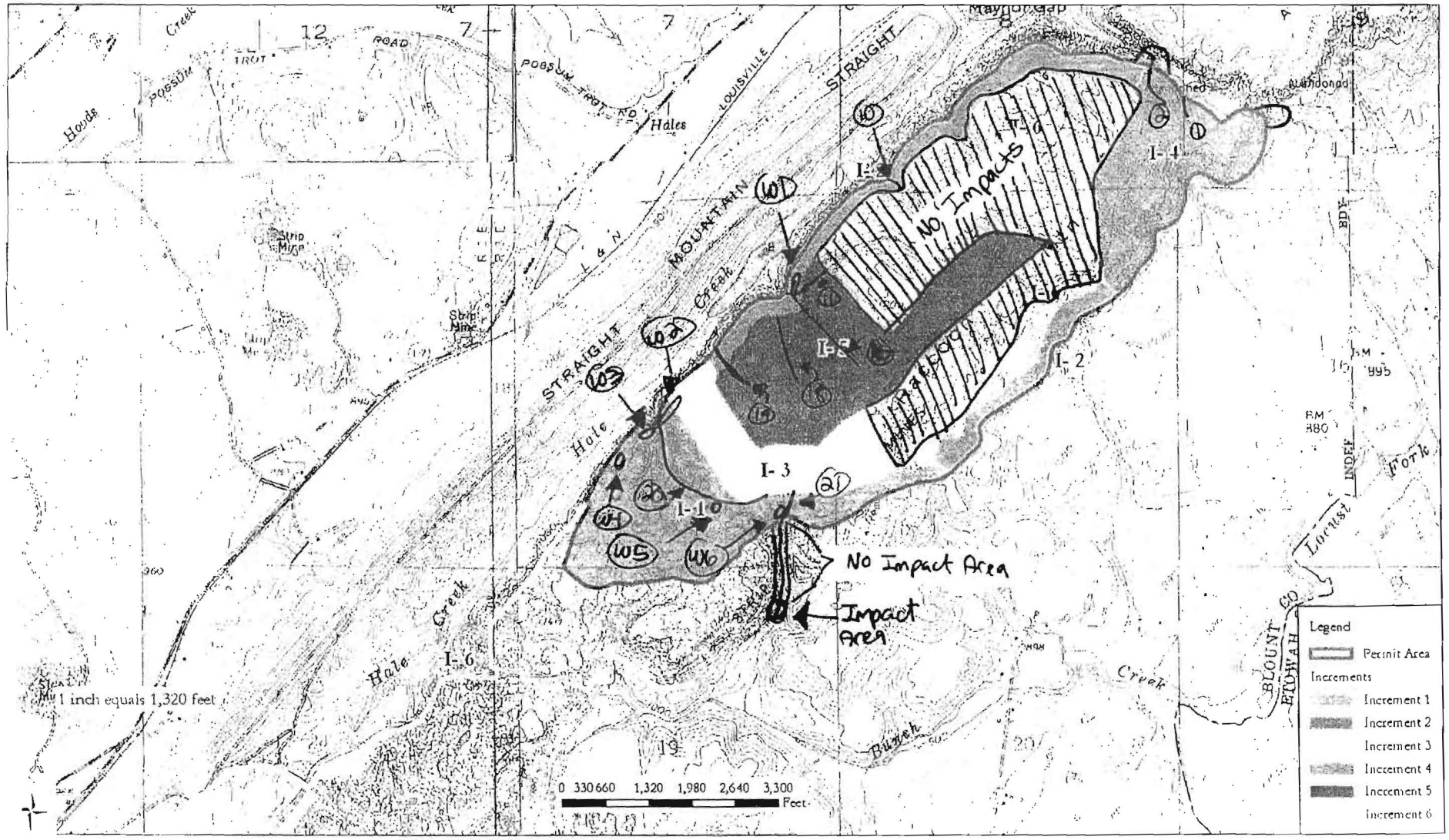
Impact Map

Alabama
Blount County
October 2010

Cedar Lake Mining, Inc.
Bull Gap Mine

Increment Map

Altoona DOQ
Hyatt Gap DOQ
Oneonta DOQ
S8, 9, 16 - 20 T12S R3E
S24 T12S R2E



CESAM-RD-I-N
Application SAM-2010-01439-CHE

MEMORANDUM FOR RECORD
SUBJECT: Department of the Army Memorandum Documenting Nationwide Permit/Regional General Permit Verification
Applicant: Cedar Lake Mining; Bull Gap Mine.

Project Location ***(Waterway, Section, Township, Range, City, County, State):*** 34.005143,-86.354685. Unnamed intermittent and ephemeral streams near Oneonta, Blount County, Alabama.

Pre-Construction Notification Receipt Date: 10-19-10 **Complete?** ☐Yes ☒No

Additional Information Requested Date: a site visit November 2010

Pre-Construction Notification Complete Date: 1-11-11

Waters of the US:
*see Jurisdictional Determination form(s) and/or Preliminary JD letter(s) dated: 6-17-11

Authority: ☐Section 10 ☒Section 404 ☐Section 103

Project Description ***(Describe activities in waters of the U.S. considered for verification):***conduct surface coal re-mining activities.

Type of Permit Requested: NWP # 49 (originally requested a 21, but later determined that project was eligible for 49).

Pre-construction Notification Required: ☒Yes ☐No

Waiver required to begin work ***(see GC 27 (a)(2) as applied to appropriate NWP***s):
☐Yes ☒ No
Rationale:

Coordination with Agencies/Tribes Needed: ☒Yes ☐No Date: 2-2-11
Resolution:

Commenting Agencies:
US Fish and Wildlife Service: No response was received.
US Environmental Protection Agency: February 24, 2011, letter addressed below.
National Marine Fisheries Service: No NFMS resources are in the project area, so NMFS was not sent coordination materials.
State Agency (list commenting state agencies) ADCNR: No response was received.

State Historic Preservation Office: No response was received.

Other:

Substantive Issues Raised and Corps Resolution *(Consideration of Comments)*:

February 24, 2011, EPA letter: The Corps hand delivered a copy of the agency coordination package to EPA on February, 1, 2011. EPA telephoned the Corps on February 14, 2011, notifying Corps of their intent to provide comments. General Condition 27, Preconstruction notification, (d) states: "the district engineer will immediately provide a copy of the PCN to ... EPA .... With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the preconstruction notification."

EPA notified the Corps 13 days after the receipt of pre-construction notification. However, because the Corps did receive the EPA comments prior to the 25-day (10 + 15) deadline, their comments are considered below:

EPA Comment: The applicant provided an adequate alternative analysis. The company considered a "no build" alternative, a preferred site alternative (reduced from the original project scope by 357 acres), and a Mining Methods analysis for the preferred site. EPA agrees that the proposed project is likely the least environmentally damaging practicable alternative.

Corps Response: concur.

EPA Comment: EPA remains concerned about the cumulative impacts of mines on their respective watersheds. We do not believe that the Corps and applicant have provided enough information to make the determination that there are no cumulative impacts from the project.

Corps Response: Robust cumulative impact materials for this permit application had not been developed at the time the agency coordination took place. Cumulative impacts are discussed in the cumulative impacts section of this decision document.

EPA Comment: EPA maintains that it is imperative for all Clean Water Act Section 404 permits to achieve the goals of the 2008 Mitigation Rule (Rule), NWP 49 conditions, and General Condition (GC) #20 of the 2007 Nationwide permits.

Corps Response: Concur.

EPA Comment: NWP 49 is conditioned such that the permittee must clearly demonstrate to the district engineer that the reclamation plan will result in a net increase in aquatic resource functions.

Corps Response: The applicant submitted a mitigation plan that was developed in accordance with the Mobile District's Stream SOP. A total of 12,729 mitigation credits will be required, and

the implementation of the mitigation plan will generate 22,880 mitigation credits.

EPA Comment: GC #20, part (f) states that compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

Corps Response: NWP GC 20 (f): mitigation plans for streams "will *normally* include a requirement for the establishment, maintenance, and legal protection ... of riparian areas next to open waters" (emphasis added). 332.4(c)(4): Site protection instrument is one of the 12 required components of a mitigation plan; 332.7(a)(1) states: "The aquatic habitats, riparian areas, buffers, and uplands that comprise the overall compensatory mitigation project must be provided long-term protection through real estate instruments *or other available mechanisms, as appropriate*" (emphasis added). The preamble to NWP GC 20 states "In some cases, it may not be feasible to require conservation easements because the various rights associated with a particular parcel of land may belong to different individuals. In such cases, other methods of protecting the mitigation site should be explored." 72 FR 11166. NWP GC 20 and 332.7(a)(1) state that site protection instruments are "normally" required or must be provided "as appropriate." The preamble to the Mitigation Rule states: "For stream compensatory mitigation projects, appropriate means of site protection will be determined by district engineers, after considering the characteristics of the compensation activities and the real estate interests of the project proponent. For example, instream rehabilitation measures may not warrant long-term protection. Specific requirements for site protection are at the discretion of the district engineer. *There are other examples of situations where it may not be feasible to require site protection through real estate or legal instruments for compensatory mitigation projects.* One potential situation is the construction of oyster habitat or the restoration of sea grass beds in state-owned tidal waters, where the project proponent does not have a real estate interest, but may obtain authorization to conduct those environmentally beneficial activities." (73 FR 19646) (Emphasis added).

EPA Comment: The mitigation submittal ranks high among the applications received for review by this office. The mitigation plan has clearly defined goals, is well thought out and addresses most of the components of the Rule, NWP 49, and GC #20. However, EPA does have concerns regarding certain aspects of the applicant's mitigation plan, defined below.

Corps Response: No response required.

EPA Comment : Substantial increase in Jurisdictional Waters: Impacts to jurisdictional waters of the United States total 7,700 If of streams and 1.9 acres of wetlands. The Surface Mining Control and Reclamation Act of 1977 requires mine landscape restoration to Approximate Original Contour (AOC) and is defined as "that surface reconfiguration achieved by backfilling and grading of the mined areas so that the reclaimed areas including any terracing or access roads closely resembles the general surface configuration of the land prior to mining and blends into and complements the drainage pattern of the surrounding terrain, with all high walls, spoil piles, and coal refuse piles eliminated." The applicant is proposing to create 25,340 If of stream. Given that the original landscape is to be restored, and that local rainfall and hydrology should remain unchanged, it is unclear where will the additional water be obtained to provide for wetted channels now more than three times greater in length than what currently exists. This concept is counter-intuitive to a water budget analysis and should be addressed before the mitigation is approved.

Corps Response: The site is an old highwall mine and an underground coal mine that has been mined since the civil war. A large percentage of the streams "gained" through the implementation of the mitigation plan will be located in areas that are currently mine spoil.

EPA Comment: Site protection instruments: EPA understands the difficulty of gaining post-mining preservation agreements with landowners. However, protection of the compensatory mitigation areas is extremely important to achieve long term success. Site monitoring is proposed for five years. It is not clear how the preserved stream reaches will be protected beyond the initial monitoring period. Since the applicant has no control over leased lands restored after mining, this issue is of particular concern since the applicant admirably elected to extend monitoring beyond five years in the event of failure. The applicant should make clear how control of the mitigation will be maintained throughout the period of all potential monitoring and is encouraged to work with land owners to establish protective covenants.

Corps Response: A discussion of the site protection instrument issues has been provided above in response to a similar question.

EPA Comment: Baseline information: EPA is not aware of any baseline information to characterize the current physical, chemical, and biological conditions at the permit site. EPA requests baseline data to assist the mitigation goals, and design, so the proposed functional lift can be clearly defined. The functional lift required to satisfy NWP 49 cannot be properly assessed without a baseline starting point.

Corps Response: The mitigation plan that was provided to EPA contained a section entitled "Baseline Information" on pages 10 through 12. The functional lift requirement of NWP 49 has been addressed in a response to another EPA comment.

EPA Comment: Ecological performance standards: Most of the buffer performance standards are well defined. We request that the applicant complete macro-invertebrate sampling in the new

stream reaches using methods approved by the state of Alabama.

Corps Response: Marco-invertebrate sampling is not required under the Stream SOP. The applicant has submitted a mitigation proposal that complies with the March 2009 Mobile District Stream SOP.

EPA Comment: Long-term management plan: The plan provided identifies Cedar Lake Mining as the party responsible for all long term mitigation components including performance standards, success criteria, and adaptive management plan. However, since leased lands are involved, it is not clear how the applicant will have any long term control of the site and the ability to implement compensatory mitigation including a long term management plan.

Corps Response: The owners of Cedar Lake Mining own the majority of project site, as well as several adjacent parcels. And the Corps believes that Cedar Lake mining will manage the property for wildlife functions once the mining and mitigation have been completed because the Otis Robison has begun construction of a hunting camp complex on the parcel immediately adjacent to the site.

EPA Comment: Financial assurances: The applicant proposes to document that they have the financial ability to pay for the mitigation estimated to be approximately $167,000. However, the purpose of financial assurance is to cover the life of the mitigation construction and monitoring that could extend many years from now. While a company may be solvent today, that provides no assurance that the company will be solvent in the future and will have the ability to provide the finances necessary to assure proper mitigation years from now. Most surety/performance bonds can be purchased at a cost of 1 - 4% of the amount to be secured, therefore, a bond on $167,000 should cost from $1,670 - $6,680. We request the Corps and applicant investigate the opportunity of securing a performance bond or other mechanism to provide financial assurance in compliance with the Rule.

Corps Response: Concur. The Corps will require a financial assurance from the applicant prior to the impacts being conducted.

EPA Comment: Final design: The mitigation proposal is primarily in draft form and does not include detailed drawings for stream configurations. The concept provided is fairly sound but it is extremely important to have an appropriately designed channel before construction of the streams begin and determine compliance. The final plan should include sampling criteria to properly document the functional lift required by NWP 49. Therefore, we request the Corps condition this permit such that all final design criteria must be approved by the Corps and EPA prior to commencement of any aquatic impacts.

EPA Comment: The requirements of Executive Order (E.O.) 12898 and the Presidential Memorandum accompanying it must be addressed appropriately in federal action-such as federal permitting under 404 of the CWA and National Environmental Policy Act. Under E.O. 12898, "each Federal agency shall make achieving environmental justice (EJ) part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or

environmental effects of its programs, policies, and activities on minority populations and low income populations." EPA would encourage the District to include EJ as part of this permit's review. Residences may be affected by changes in ground water (drinking water wells), particulate matter, noise, vibrations, and increased traffic.

Corps Response: In accordance with Title III of the Civil Right Act of 1964 and Executive Order 12898, it has been determined that the project would not directly or through contractual or other arrangements, use criteria, methods, or practices that discriminate on the basis of race, color, or national origin nor would it have a disproportionate effect on minority or low-income communities. Additionally, many of the issues that EPA requests that the Corps undertake in it's EJ review are not under the Corps scope of analysis because they are not directly related to 1st order Corps impacts or are not related to water at all.

EPA Comment: EPA has determined that the project, as currently proposed, may not comply with the CWA and Section 404(b)(1) Guidelines, the Conditions of NWP 49 and GC #20 of the 2007 Nationwide permits. We believe this project should be advertised as an Individual Permit due to its individual and cumulative impacts. We are requesting the Corps address our mitigation concerns and provide us with forthcoming final compensatory mitigation design plans for our review.

Corps Response: The Corps is unsure which part of the 404(B)(1) guidelines EPA is concerned about, as this comment is the first time they are mentioned in EPA's letter. Compliance with the conditions of NWP 49 and GC 20 are discussed above, and cumulative impacts are discussed in other sections of this document. GC 27 states that "the district engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each preconstruction notification that the resource agencies' concerns were considered." The Corps fully considered EPA's comments, but cannot provide EPA another opportunity to review the PCN materials.

Compliance with Other Federal Laws ***(If specific law is not applicable write N/A):***

Endangered Species Act:
Name of species present: None
Effects determination: No Effect
Date of Service(s) concurrence: March 16, 2010
Basis for "no effect" determination: USFWS stamped letter dated March 16, 2010
Additional information (optional):

Magnuson-Stevens Act (Essential Fish Habitat):
Name of species present: NA
Effects determination: No effect

Date of Service(s) concurrence: Basis for "no effect" determination: No EFH exists in central Alabama.
Additional information (optional):

Section 106 of the National Historic Preservation Act:
Known site present: ☒ yes ☐ no
Survey required/conducted: ☒ yes ☐ no
Effects determination: no effect
Rationale: Survey found that most top soil has been lost from site, and that rock shelters at the site had been looted. The Corps believes that there is no potential to effect properties listed or eligible for listing because of the impacts to the land surface and looting discussed in the Office of Archeological Research report conducted by Sam Mizelle, dated March 25, 2010.
Date consultation complete (if necessary):
Additional information (optional):

Section 401 Water Quality Certification:
Individual certification required: ☐ yes ☒ no
☐Issued ☐Waived ☐Denied

Coastal Zone Management Act:
Individual certification required: ☐ yes ☒ no
☐Issued ☐Waived ☐Denied
Additional information (optional):

Wild and Scenic Rivers Act:
Project located on designated or "study" river: ☐ yes ☒no
Managing Agency:
Date written determination provided that the project will not adversely affect the Wild and Scenic River designation or study status:
Additional information (optional):
Other

Special Conditions Required ***(include rationale for each required condition/explanation for requiring no special conditions)***: ☒ yes ☐ no

a. The permittee shall implement and abide by the mitigation plan "Compensatory Mitigation Plan" dated January 11, 2011. A status report on the mitigation construction, including as-built drawings, must be submitted to the U.S. Army Corps of Engineers, Mobile District, Regulatory Division, 13 months from the date of permit issuance. Annual status reports on mitigation construction are required until mitigation construction is complete. The Permittee shall implement the mitigation plan on or before March 17, 2013.

b. The permittee shall construct 7,600 linear feet of intermittent streams and associated buffers as compensatory mitigation for the streams impacts of the proposed project. Mitigation monitoring reports will be due annually for 5 years from the final due date of the as-built

drawings and final annual mitigation construction status report. All stream monitoring reports must be prepared in accordance with "Appendix D: Stream Mitigation Monitoring Requirements" of the March 2009 document entitled "*Mobile District Compensatory Stream Mitigation Standard Operation Procedures and Guidelines*," and Regulatory Guidance Letter 06-03. All reports must be submitted to the U.S. Army Corps of Engineers, Mobile District, Regulatory Division and must prominently display the reference number SAM-2010-01439-CHE.

c. The permittee shall construct 1.5 acres of wetlands as compensatory mitigation for wetland impacts of the proposed project. Mitigation monitoring reports will be due annually for 5 years from the final due date of the as-built drawings and final annual mitigation construction status report. All wetland monitoring reports must be prepared in accordance with Regulatory Guidance Letter 06-03. All reports must be submitted to the U.S. Army Corps of Engineers, Mobile District, Regulatory Division and must prominently display the reference number SAM-2010-01439-CHE.

d. The permittee's obligation to provide compensatory mitigation for the stream impacts authorized under this permit shall not be considered complete until the streams constructed as compensatory mitigation for the proposed project meet the all the success criterion of "Table 2" of the "Appendix D: Stream Mitigation Monitoring Requirements" of the March 2009 document entitled "*Mobile District Compensatory Stream Mitigation Standard Operation Procedures and Guidelines*" for 5 consecutive years, and is verified by letter by Mobile District, U.S. Army Corps of Engineers, Regulatory Division.

e. The permittee's responsibility to complete the required compensatory mitigation as set forth in Special Conditions "a," "b," "c," and "d," will not be considered fulfilled until the permittee has demonstrated that the no less than 12,729 stream credits were generated as a result of the compensatory mitigation activities (using the 2009 Mobile District Stream SOP) and receives written verification of mitigation success from the Mobile District, U.S. Army Corps of Engineers, Regulatory Division. If the compensatory mitigation is found to be unsuccessful 6 years after the due date of the as built drawings, the permittee must purchase from a U.S. Army Corps of Engineers approved mitigation bank, 12,729 stream credits.

f. The aquatic resources constructed as compensatory mitigation for work authorized by this permit shall not be made the subject of a future individual or general Department of the Army permit application for fill or other development, except for the purposes of enhancing or restoring the mitigation associated with this project.

g. The permittee shall obtain a Financial Assurance in the amount of $167,000.00 to provide financial assurance for the performance of all of the obligations, covenants, terms, conditions, and agreements required of the Permittee under this permit. The Financial Assurance shall be submitted to the Mobile District, U.S. Army Corps of Engineers for approval prior to being executed, and shall be posted before construction authorized by this permit commences.

h. The permittee shall obtain 0.07 wetland mitigation bank credits from the Big Sandy Mitigation Bank in compliance with the provisions of the bank's mitigation banking instrument. The permittee shall submit documentation of the completed mitigation bank transaction to the Mobile District, U.S. Army Corps of Engineers before construction authorized by this permit commences.

i. You shall comply with all the terms and conditions of the Alabama Department of Environmental Management Section 401 Water Quality Certifications for the Nationwide Permits. This document can be viewed at our website: www.sam.usace.army.mil/rd/reg/nwp/htm for you review and compliance, or at your request a paper copy will be provided to you.

j. If human remains or archaeological resources are encountered during construction, all ground disturbing activities shall cease in the immediate area and the permittee shall immediately (within one business day of discovery) notify the Regulatory Division, Mobile District, U.S. Army Corps of Engineers (Corps) and the Alabama Historical Commission. The permittee shall perform any work required by the Corps in accordance with Section 106 of the National Historic Preservation Act and Corps regulations.

k. The permittee shall not initiate any work authorized under this U.S. Army Corps of Engineers permit prior to obtaining a permit to conduct surface coal mining from the Alabama Surface Mining Commission for the project site.

Compensatory Mitigation Determination: The applicant has avoided and minimized impacts to the maximum extent practicable.

Is compensatory mitigation required for unavoidable impacts to jurisdictional aquatic resources to reduce the individual and cumulative adverse environmental effects to a minimal level?
☒ yes ☐ no *[If "no," do not complete the rest of this section and include an explanation of why not here]*
Is the impact in the service area of an approved mitigation bank? no

Does the mitigation bank have appropriate number and resource type of credits available? ☒ yes ☐ no

Is the impact in the service area of an approved in-lieu fee program? ☐ yes ☒ no
i. Does the in-lieu fee program have appropriate number and resource type of credits available?
☐ yes ☐ no
Check the selected compensatory mitigation option(s):
☐ mitigation bank credits
☐ in-lieu fee program credits
☐ permittee-responsible mitigation under a watershed approach
☒ permittee-responsible mitigation, on-site and in-kind
☐ permittee-responsible mitigation, off-site and out-of-kind

If a selected compensatory mitigation option deviates from the order of the options presented in §332.3(b)(2)-(6), explain why the selected compensatory mitigation option is environmentally preferable. Address the criteria provided in §332.3(a)(1) (i.e., the likelihood for ecological success and sustainability, the location of the compensation site relative to the impact site and their significance within the watershed, and the costs of the compensatory mitigation project): NWP 49 requires "The permittee must clearly demonstrate to the district engineer that the reclamation plan will result in a net increase in aquatic resource functions." As part of the original application, the applicant voluntarily submitted a mitigation plan designed to compensate for the loss of aquatic resource functions and values that will be impacted as a result of the proposed project. The mitigation plan includes the construction 7,600 linear feet of intermittent stream, and more than 15,000 lf of ephemeral streams. The proposed mitigation is outlined in more detail in the mitigation plan. The proposed mitigation will provide additional wildlife habitat and habitat diversity, enhanced food web support, increased floodwater storage, connect historic drainages that were severed as a result of mining, and improved buffering of contaminants. Implementation of this plan will mitigate for the aquatic resource impacts in compliance with National and District Policy. The Corps has evaluated the proposed mitigation plan. I have determined that the implementation of the mitigation plan will result in the establishment / reestablishment, of aquatic resources in a rough proportionality to the project impact, considering the loss of aquatic resources and the nature of and extent of that impact. The mitigation plan proposed by the applicant is reasonable, has been specifically designed for this project site to compensate for the loss of wetlands and their functions, which will occur during project construction. With the addition of the special conditions listed at the end of this document, I have determined that impacts to wetlands are not contrary to the public interest in compliance with the Guidelines.

Determination *(Reference General Condition 27(e)):*

The proposed activity, with proposed mitigation (if applicable) would result in no more than minimal individual and cumulative adverse environmental effects and would not be contrary to the public interest, *provided the special conditions and/or modifications identified in the above are incorporated.* This project complies with all terms and conditions of NWP 49 including any applicable regional conditions.

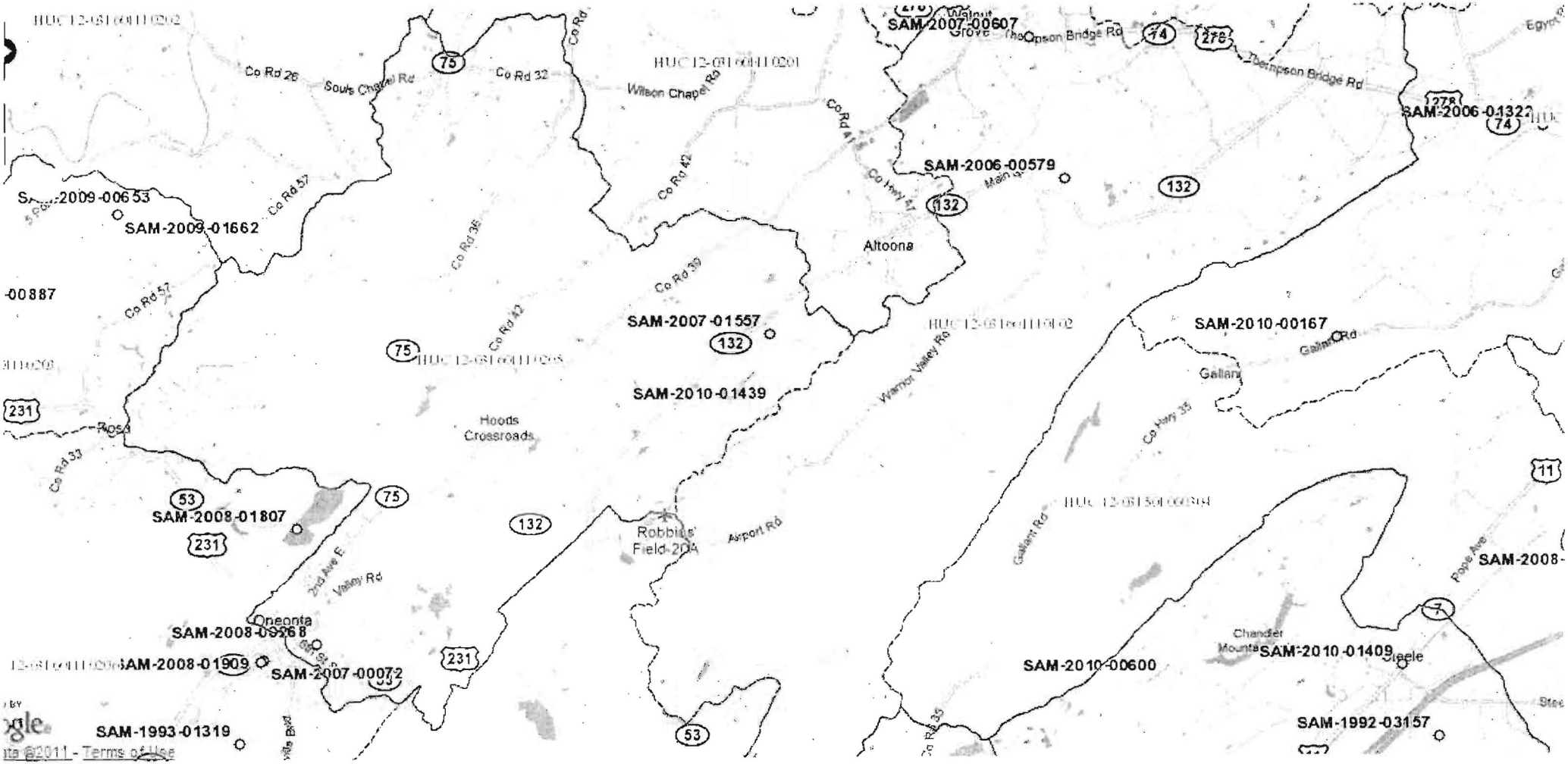
PREPARED BY:

Casey Ehorn Date: 9/13/11
Casey Ehorn
Project Manager

APPROVED BY:

Cindy J. House-Pearson Date 9/13/11
Cindy J. House-Pearson

Chief, Inland Section North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SAM-2008-01807
SAM-2008-09268
SAM-2008-01909
SAM-2007-00072
SAM-1993-01319
SAM-2010-00600
SAM-2010-01409
SAM-1992-03157
Altoona
Hoods Crossroads
Robbins' Field-204
Oneonta
Gallant
Steele
Chandler Mountain
Wilson Chapel Rd
Souls Chapel Rd
Thompson Bridge Rd
Warrior Valley Rd
Airport Rd
Valley Rd
Gallant Rd
Pope Ave
Co Rd 26
Co Rd 32
Co Rd 35
Co Rd 39
Co Rd 42
Co Rd 47
Co Rd 57
Co Rd 33
Co Hwy 47
Co Hwy 35
Main St
2nd Ave E
6th St
Egypt
Ross
HUC 12-081604110201
HUC 12-081604110202
HUC 12-081604110203
HUC 12-081604110204
HUC 12-081504000304
Terms of Use

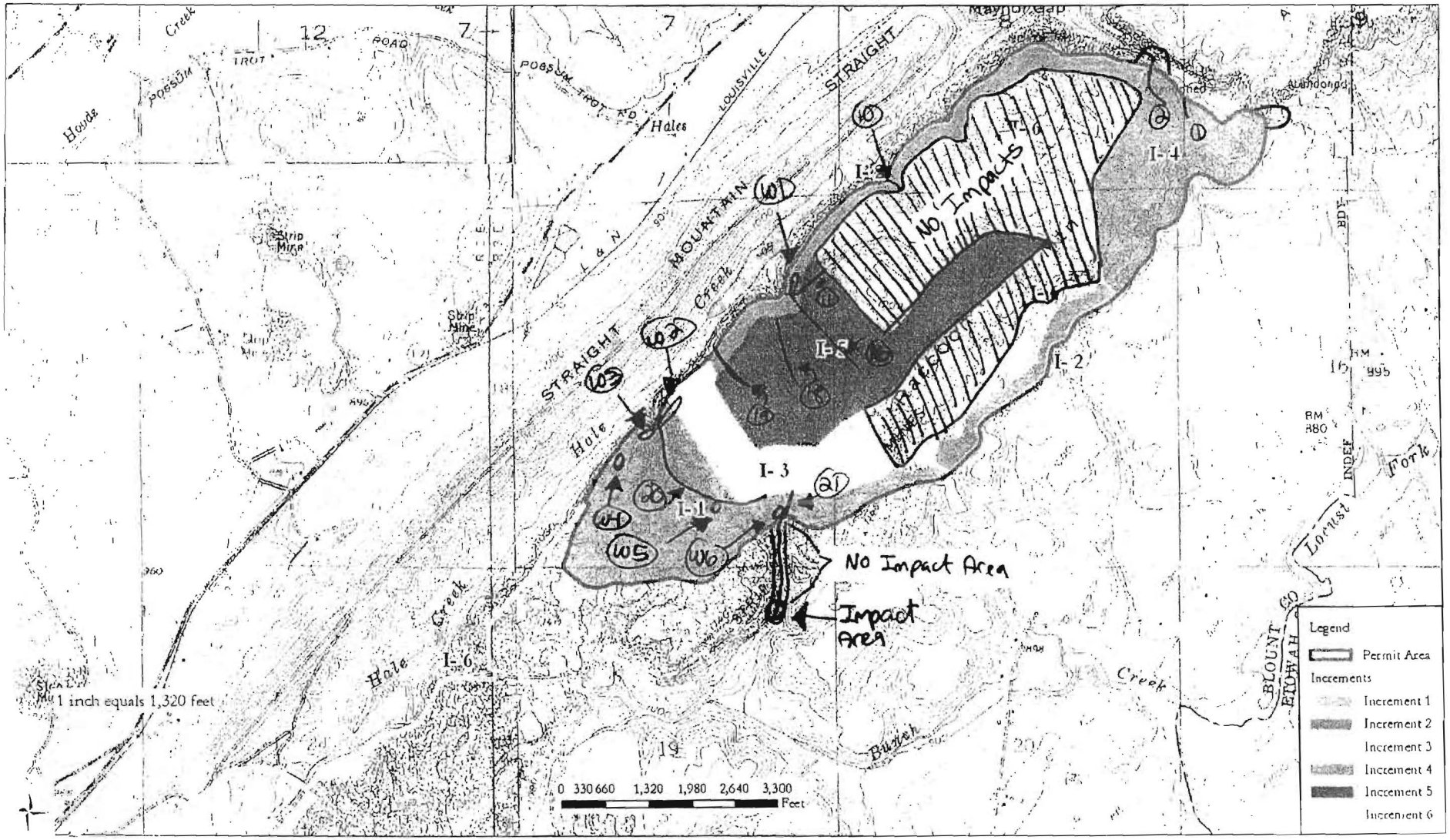
Impact Map

Alabama
Blount County
October 2010

Cedar Lake Mining, Inc.
Bull Gap Mine

Increment Map

Altoona DOQ
Hyatt Gap DOQ
Oneonta DOQ
S8, 9, 16 - 20 T12S R3E
S24 T12S R2E



Please contact me at (205) 290-9096 or Casey.H.Ehorn@usace.army.mil if you have any questions. For additional information about our Regulatory Program, visit our web site at www.sam.usace.army.mil/RD/reg, and please take a moment to complete our customer satisfaction survey while you're there. Your responses are appreciated and will allow us to improve our services.

Sincerely,

Casey Ehorn

Casey Ehorn
Regulatory Division

Enclosures

CHE 9-13-11
EHORN/RD-I-N

SEC CHIEF RD-I-N
CH-P 9/13

RD-IN-N File

Enclosure 1

US Army Corps of Engineers
Mobile District

NOTIFICATION OF COMMENCEMENT OF WORK

Permit Number: SAM-2010-01439-CHE

Name of Permittee: Cedar Lake Mining, Inc. (Bull Gap Mine)

Date of Permit Issuance: September 7, 2011

Upon commencement of the authorized work and any mitigation required by the permit, you must complete and return this notification to the following address:

U.S. Army Corps of Engineers, Mobile District
Regulatory Division (RD-I-N)
218 Summit Pkwy, Suite 222
Homewood, AL 35209

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with all terms and conditions of this permit the permit is subject to permit suspension, modification, or revocation and you are subject to an enforcement action by this office.

IT SHALL NOT BE LAWFUL TO DEVIATE FROM SUCH PLANS EITHER BEFORE OR AFTER COMPLETION OF THE WORK, unless modification of said plans has previously been submitted to and received the approval of the Department of the Army. If for any reason it becomes necessary to make a material change in location or plans for this work, revised plans should be submitted promptly to the District Engineer in order that the revised plans may receive the approval required by law before work is begun.

PERMITTEE TO COMPLETE THE FOLLOWING:

Date Work Commenced:_____

_____ _____

Signature of Permittee Date

Enclosure 2

US Army Corps of Engineers
Mobile District

Permit Number: SAM-2010-01439-CHE

Name of Permittee: Cedar Lake Mining, Inc. (Bull Gap Mine)

Date of Permit Issuance: September 7, 2011

Upon completion of the activity authorized by this permit and any mitigation required by the permit, please sign this certification and return it to the following address:

U.S. Army Corps of Engineers
Mobile District
Regulatory Division
Inland Branch
Post Office Box 2288
Mobile, Alabama 36628-0001

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with all terms and conditions of this permit the permit is subject to permit suspension, modification, or revocation and you are subject to an enforcement action by this office.

I hereby certify that the work authorized by the above-referenced permit has been completed in accordance with the terms and conditions of the said permit, and the required mitigation was completed in accordance with the permit conditions.

_____ _____

Signature of Permittee Date

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4
SAM NUNN
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA GEORGIA 30303-8960

FEB 2 4 2011

Colonel Steven J. Roemhildt
U.S. Army Corps of Engineers
Mobile District
Attn: Candice M. Wheelahan
218 Summit Parkway
Homewood, Alabama 35209

Subject: Nationwide Permit 49 SAM-2010-01439-CHE
Cedar Lake Mining, Bull Gap Mine, Blount County, AL.

Dear Colonel Roemhildt:

The U.S. Environmental Protection Agency (EPA), Region 4, has reviewed the Pre-Construction Nationwide Permit 49 (NWP 49) notice regarding the proposed 543 acre Bull Gap Mine in Blount County, Alabama. Impacts to jurisdictional waters of the United States (U.S.) include 3,820 linear feet (lf) of intermittent streams, 3,880 lf of ephemeral streams (7,700 lf total), and 1.9 acres of wetlands. This project is within the United States Geographic Survey Ecoregion 68d of the major Appalachian geographic province.

According to the information provided by the applicant: The site is impacted by previous mining activities that have not been reclaimed or reclamation was unsuccessful. The wetlands to be impacted are poor quality and are primarily within isolated ponds created in upland areas. The streams have very little value/function to support macro-invertebrates. The applicant is proposing to restore the aquatic resources to a higher functional value. Mining will occur in four increments in a phased approach. Some of the site reclamation includes creating intermittent and ephemeral stream and establishing a 50 foot upland buffer along some segments. Water quality measures will be implemented to protect off-site aquatic resources including seventeen sediment basins. The planned mitigation will create 7,600 lf of intermittent stream and 17,740 lf of ephemeral stream (25,340 lf total). Also, 15,200 lf of riparian buffer (50 feet wide) will be created (17 acres total). Approximately 1.5 acres of wetlands will be created/restored buffered by 2 acres of uplands.

Avoidance & Minimization

The applicant provided an adequate alternative analysis. The company considered a "no build" alternative, a preferred site alternative (reduced from the original project scope by 357 acres), and a Mining Methods analysis for the preferred site. EPA agrees that the proposed project is likely the least environmentally damaging practicable alternative.

Cumulative Impacts

EPA remains concerned about the cumulative impacts of mines on their respective watersheds. We do not believe that the Corps and applicant have provided enough information to make the determination that there are no cumulative impacts from the project.

Compensatory Mitigation

EPA maintains that it is imperative for all Clean Water Act Section 404 permits to achieve the goals of the 2008 Mitigation Rule (Rule), NWP 49 conditions, and General Condition (GC) #20 of the 2007 Nationwide permits.

NWP 49 is conditioned such that the permittee must clearly demonstrate to the district engineer that the reclamation plan will result in a net increase in aquatic resource functions.

GC #20, part (f) states that compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

The mitigation submittal ranks high among the applications received for review by this office. The mitigation plan has clearly defined goals, is well thought out and addresses most of the components of the Rule, NWP 49, and GC #20. However, EPA does have concerns regarding certain aspects of the applicant's mitigation plan, defined below.

> Substantial increase in Jurisdictional Waters: Impacts to jurisdictional waters of the United States total 7,700 lf of streams and 1.9 acres of wetlands. The Surface Mining Control and Reclamation Act of 1977 requires mine landscape restoration to Approximate Original Contour (AOC) and is defined as "that surface reconfiguration achieved by backfilling and grading of the mined areas so that the reclaimed areas including any terracing or access roads closely resembles the general surface configuration of the land prior to mining and blends into and complements the drainage pattern of the surrounding terrain, with all high walls, spoil piles, and coal refuse piles eliminated." The applicant is proposing to create 25,340 lf of stream. Given that the original landscape is to be restored, and that local rainfall and hydrology should remain unchanged, it is unclear where will the additional water be obtained to provide for wetted channels now more than three times greater in length than what currently exists. This

concept is counter-intuitive to a water budget analysis and should be addressed before the mitigation is approved.

Site protection instruments: EPA understands the difficulty of gaining post-mining preservation agreements with landowners. However, protection of the compensatory mitigation areas is extremely important to achieve long term success. Site monitoring is proposed for five years. It is not clear how the preserved stream reaches will be protected beyond the initial monitoring period. Since the applicant has no control over leased lands restored after mining, this issue is of particular concern since the applicant admirably elected to extend monitoring beyond five years in the event of failure. The applicant should make clear how control of the mitigation will be maintained throughout the period of all potential monitoring and is encouraged to work with land owners to establish protective covenants.

Baseline information: EPA is not aware of any baseline information to characterize the current physical, chemical, and biological conditions at the permit site. EPA requests baseline data to assist the mitigation goals, and design, so the proposed functional lift can be clearly defined. The functional lift required to satisfy NWP 49 cannot be properly assessed without a baseline starting point.

Ecological performance standards: Most of the buffer performance standards are well defined. We request that the applicant complete macro-invertebrate sampling in the new stream reaches using methods approved by the state of Alabama.

Long-term management plan: The plan provided identifies Cedar Lake Mining as the party responsible for all long term mitigation components including performance standards, success criteria, and adaptive management plan. However, since leased lands are involved, it is not clear how the applicant will have any long term control of the site and the ability to implement compensatory mitigation including a long term management plan.

Financial assurances: The applicant proposes to document that they have the financial ability to pay for the mitigation estimated to be approximately $167,000. However, the purpose of financial assurance is to cover the life of the mitigation construction and monitoring that could extend many years from now. While a company may be solvent today, that provides no assurance that the company will be solvent in the future and will have the ability to provide the finances necessary to assure proper mitigation years from now. Most surety/performance bonds can be purchased at a cost of 1 – 4% of the amount to be secured[1], therefore, a bond on $167,000 should cost from $1,670 – $6,680. We request the Corps and applicant investigate the opportunity of securing a performance bond or other mechanism to provide financial assurance in compliance with the Rule.

Final design: The mitigation proposal is primarily in draft form and does not include detailed drawings for stream configurations. The concept provided is fairly sound but it is extremely important to have an appropriately designed channel before construction of

[1] http://www.jwsuretybonds.com/info/faq.htm and http://www.suretybonds.com/edu/faqs/

the streams begin and determine compliance. The final plan should include sampling criteria to properly document the functional lift required by NWP 49. Therefore, we request the Corps condition this permit such that all final design criteria must be approved by the Corps and EPA prior to commencement of any aquatic impacts.

Environmental Justice

The requirements of Executive Order (E.O.) 12898 and the Presidential Memorandum accompanying it must be addressed appropriately in federal action—such as federal permitting under 404 of the CWA and National Environmental Policy Act. Under E.O. 12898, "each Federal agency shall make achieving environmental justice (EJ) part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." EPA would encourage the District to include EJ as part of this permit's review. Residences may be affected by changes in ground water (drinking water wells), particulate matter, noise, vibrations, and increased traffic.

Conclusion

EPA has determined that the project, as currently proposed, may not comply with the CWA and Section 404(b)(1) Guidelines, the Conditions of NWP 49 and GC #20 of the 2007 Nationwide permits. We believe this project should be advertised as an Individual Permit due to its individual and cumulative impacts. We are requesting the Corps address our mitigation concerns and provide us with forthcoming final compensatory mitigation design plans for our review.

Thank you for the opportunity to comment on this public notice. If you have any questions regarding these comments, please contact Mark LaRue (larue.mark@epa.gov or 404-562-9417) or Duncan Powell (powell.duncan@epa.gov or 404-562-9258).

Sincerely,

Duncan Powell

Duncan M. Powell
Chief
Mining Section

cc: Ms. Elizabeth Brown, AHC
Mr. William Pearson. USFWS
Mr. Matthew Marshall, ADCNR
Ms. Brandy Bowen, ADEM
Mr. Eric Sanderson, ADEM
Dr. Randall Johnson, ASMC
Ms. Candice M. Wheelahan, USACE
Mr. Nelson Brooke, Black Warrior River Keeper
Ms. Cindy Lowry, Alabama Rivers Alliance, Inc.

To:

Candace M. Wheelahan, US Army Corps of Engineers, Birmingham
candice.M.Wheelahan@usace.army.mil

Elizabeth Brown - Alabama Historical Commission, Montgomery
ebrown@preserveala.org

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Matthew Marshall - Alabama Department of Conservation & Natural Resources, Montgomery
Matthew.Marshall@dcnr.alabama.gov

Brandy Bowen, Eric Sanderson - Alabama Department of Environmental Management, Montgomery –bbowen@adem.state.al.us
els@adem.state.al.us

Randall Johnson, PhD - Alabama Surface Mining Commission, Jasper
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Nelson Brooke – Black Warrior River Keeper, 712 37th Street South, Birmingham, AL 35222

Cindy Lowry – Alabama Rivers Alliance, 2027 Second Avenue North, Ste. A, Birmingham, AL 35203

Bcc:

Mark Nufer
Jessica Martinez R3
Wendy Melgin R5

Delta Natural Resource Service, Inc.
P.O Box 941
Hartselle, Alabama 35640
Cell # 256-565-1248

September 7, 2010

Mrs. Cindy J. House-Pearson
Lead Team Leader
Birmingham Field Office
Regulatory Division
CESAM-RD-I-N
218 Summit Parkway - Suite 222
Homewood, Alabama 35209

Cedar Lake Mining, Inc.
Task Engineering Management, Inc (contact person)
P.O. Box 660548
Birmingham, Alabama 35266
Contact: Mr. Jerry Williams (w) 205-978-5070

Ref. Pre-Construction Notification (PCN) for Cedar Lake Mining, Inc. – Bull Gap Mine

This Pre-Construction Notification and mitigation plan is submitted for Cedar Lake Mining, Inc. Mr. Jerry Williams is the contact person for this project. Contact information is shown above. The company is planning to surface area mine an area in Blount County, Alabama. It is located in Sections 8, 9, 16, 17 18 & 19, T12S, R3E and Sections 20, 24 & 25 T12S, R2E in Blount County, Alabama. Actual project boundaries are outlined on aerial photographs and topographic maps within the mitigation document.

This mining operation will extract subsurface coal by using approved, safe, and modern mining procedures and equipment. Typically, the surface area mining process begins with the removal of timber and other vegetation, building access roads, drilling and blasting overburden, overburden removal down to seams of coal, coal extraction, re-grading and re-establishing aquatic resource and re-establishing desirable vegetation on-site.

All primary and secondary roads will be built as designed by a Professional Engineer and approved by the appropriate regulatory authority.

To access the coal reserves below the surface, holes are drilled into the overburden, a calculated amount of explosives are then placed at pre-determined depths and ignited. This fractures the rock and other overburden to create “Spoil”. This is either hauled to a stock pile area or it is

graded into an existing adjacent pit created during previous mining operations. This process is repeated in predetermined lines called “Cuts” until the seams of coal have been removed.

The project boundary is near Hale Creek to the north and drainage water from the southern part of the project flows into Bunch Creek. These aquatic resources will be protected from the adverse impacts of this mining operation by the design, placement, and construction of several sediment basins above (ground elevation) these resources. There are approximately 7.18 surface acres of planned sediment basins to control runoff and contain sediment from this mining operation. These basins, planned, constructed and properly maintained will prevent off-site contamination of aquatic resources.

There are 5,320 linear feet or 0.25 acres of jurisdictional waters on the project site. 3,700 linear feet are intermittent streams and 1,620 linear feet are ephemeral stream. These aquatic resources will be mined through during the coal extraction process and there is a temporally loss of function. However, the affected aquatic resources will be restored on-site. Complete mitigation will restore these streams to a higher functional value to include proper slope bank, riffle/pool sequence, meanders and other characteristics associated with a highly functional restored stream segment. Conceptual plans, details and an implementation process for the restoration of affected aquatic resources are contained in the mitigation document.

There are 6 small areas of wetland within the project boundary. The 1.9 acres of wetlands were identified and delineated. The owner plans to mitigate this aquatic resource on-site in an appropriate manner to enhance the aquatic resources within the boundary and improve wildlife habitat in the surrounding areas.

Cedar Lake Mining, Inc. agrees to purchase wetland credits in an approved wetland mitigation bank to cover the Site Protection Instrument requirement for mitigating aquatic resources on-site. The calculated credits for the company to purchase are 0.0726

Before this project is initiated on-site, several regulatory agencies have to approve the purpose, plans, designs and methods of coal mining. These agencies include the Mine Safety & Health Administration (MSHA), Alabama Surface Mining Commission (ASMC), and the Alabama Department of Environmental Management (ADEM). Approvals from these regulatory authorities have been received or they are pending. Mining in the project area will not commence until these agencies (including the COE) have fully approved mining in this area.

Aquatic resources (streams) on the project site were identified, characterized and delineated according to instruction from the Mobile District and the Mobile District Stream SOP. There are 5,320 linear feet or 0.25 acres of affected jurisdictional streams and 1.9 acres of wetlands on the project site. These aquatic resources will be mitigated on-site as detailed in the accompanying mitigation plan.

The total acres of jurisdictional impacts for this mining project are 2.14 acres including the delineated wetlands acres within the project boundary.

The wetland evaluation for the site was performed using the Routine Wetland Determination Method as outlined in the COE *1987 Wetland Delineation Manual.*

Task Engineering has obtained concurrence letters from the following authorities: An Archaeological Survey performed by The University of Alabama; U.S Fish and Wildlife service comments; State of Alabama, and the Department of Conservation and Natural Resources Comments. These agencies have concurred there are no subjects within the project boundaries that fall under their jurisdiction.

We appreciate your assistance and guidance on this project. If you have additional questions please contact me.

Sincerely,

Cleo Stubbs

Registered Professional Soil Classifier # 71

PROJECT OVERVIEW & ENVIRONMENTAL ASSESSMENT

Cedar Lake Mining, Inc. is planning to surface area mine a site in Blount County, Alabama. This mine site is identified as the Bull Gap Mine for company records and permitting by the Alabama Surface Mining Commission. The site is located in Sections 8, 9, 16, 17, 18, 19 and 20, T12S, R3E and Sections 24 and 25 T12S, R2E in Blount County, Alabama. The project or mining area is approximately 543 acres (*See tab 1 for maps*).

The natural landscape at this project site is mainly a series of undulating upland ridges and moderately steep to very steep side slopes. Additionally, the major part of this planned mining project area has been previously mined. The western part of the mined area has been adequately reclaimed and planted with loblolly pine trees. The areas immediately east of the loblolly pine plantation consist of soil disturbed or mined areas including high wall and mined spoil sites, and some incomplete restoration in many areas. There are several hundred feet of high walls and adjacent drainage water collection areas or pools. These site conditions are the remnants of the previous mining operation and there was no on-site reclamation attempted. The high wall/un-reclaimed areas and the drainage water collection areas or pools are located primarily along the edges of the northern and southern boundaries. These are the areas where the coal seams were close to the surface, less overburden to manage and thusly, where the previous mining occurred. The areas immediately adjacent to high wall and ponded/sediment basins are treacherous. The wall edges are subject to crumbling and sloughing and the basins are very deep at most of the edges. They are unsafe and environmentally problematic.

The drainage divide for the project is along a series of longitudinal ridges near the southern boundary and runs northeast to southwest. The elevation along the ridges is approximately 1200 feet. The surface and subsurface hydrology within the planned mining area has been changed. Most of the water flow paths within the project boundaries have been severely altered and some segments are relocated. Surface and intermittent subsurface drainage water north of this line of ridges flow into several ephemeral drainageways. Drainage water moves above and slightly below ground surface as it flows into Hale Creek. Hale Creek is a perennial tributary a short distance away from the northern project boundary. Surface drainage water south of the longitudinal divide flows into several unnamed intermittent streams. The unnamed intermittent streams drain into Bunch Creek. The mining company plans to design and construct several sediment basins to protect and prevent contamination of these and other off-site aquatic resources. Some of the drainageways identified within the project boundary flows through ponded areas created during previous mining operations. These basin or ponded areas were constructed or created in non-jurisdictional areas (upland slopes without drainage features).

There are areas of wetlands identified and delineated within the project boundary. Most of the wetland areas are located along the edges and adjacent to ponded areas on-site. The earthen material is mostly mine spoil but it is suitable for the growth of some wetland type plants such as sweet gum, rush, and an occasional willow tree. The wetlands are very low quality. Wildlife utilization is very low because of access, poor cover, and the lack of food and den/nesting areas.

The planned mining area is approximately 1260 feet in elevation at the highest point within the project boundary to a low elevation of approximately 1000 feet along the northern boundary near

Hale Creek. Most of the project area is artificial regenerated loblolly pine forest plantation or natural regenerated mixed pine hardwood forest. The mixed pine hardwood forest is mainly on the few acres of un-mined land within the project boundary. There are several different age groups through the forest. Management is low intensity for the entire project area and production quality is moderate to low. The understory and ground cover is mainly gall berry, green brier and other shrubs and grasses.

The potential to support habitat for upland wildlife and wetland wildlife is poor. Most of the upland areas are unsuitable for wildlife management practices such as prescribe burning, planting seed producing seedling and establishing game food plots. The poor access across the site influences utilization of several species of wildlife such as deer and turkey. Wildlife utilization is poor for this site because the food source is low or absent in pine plantation areas. The mixed pine hardwood forest is low in seed production and there are only a few den trees or areas for nesting. Wildlife cover is poor in many places. The ephemeral/intermittent streams on site have very little value/function to support macro invertebrates. Typical habitat support characteristics such as riffle/pool sequences and meanders are not present along stream segments. The channel bed/bank for the intermittent and ephemeral streams is mainly rock, solid and broken pieces.

The Mining Sequence & Net Environmental Benefits

The mining of this project area will occur in 4 increments as designed by the mining engineer for the project. They are increments # 1, # 3, # 4 and # 5. Each increment will be drilled/blasted and excavated according to plans and design. Excavation and removal of overburden will begin in increment # 1. After mining is complete in increment #1, the mining process will continue in increments # 3, # 4 and # 5. The refuse, rock and other earthen material will be spoiled in increment # 2. They are drainage collection pools and high walls. These areas were previously mined prior to regulation and they have not been reclaimed. In addition to utilizing these areas for spoil material, during the mining process the mine operator will reclaim these areas according to the Alabama Surface Mining Commission regulations. Some of the reclamation will include creating intermittent and ephemeral stream and establishing a 50 foot buffer along some segments. This reclamation process in conjunction with the planned mining in the area, will improve water quality and the quality of the environment overall. In addition, the reclamation of the unreclaimed mined areas will provide suitable habitat for several species of wildlife. Water quality measures will be implemented to protect off-site aquatic resources including the construction of seventeen sediment basins when appropriate as the mining of the site progresses.

There are 8,440 linear feet of jurisdictional waters located in the project area. It includes 4,180 linear feet of ephemeral streams and 4,260 linear feet of intermittent streams. There are 1.9 acres of jurisdictional wetlands identified and delineated within the project boundaries.

The jurisdictional streams identified within the project area are characterized as having bed and bank and other properties associated with jurisdictional waters. There are ephemeral and intermittent streams in the proposed mining/project area. Also, there are several other non jurisdictional water flow paths located within the project boundary. These water flow paths are

erosional features on steep slopes. Water is mainly sheet flow and these erosional features do not have bed and bank.

The mitigation for the proposed impacts to these stream resources will be conducted on-site. The owner will provide the U.S. Corps of Engineers (COE) the proper design documents. The documents will include plan view drawings, typical cross section drawings and engineering design, and layout of proposed stream segment reconstruction. Conceptual drawings of restored aquatic resources are contained in this document.

The intermittent stream resources in the project area have low quality. They do not have meanders and or functioning riffle/pool sequences along the flow path. The relative straight ephemeral stream segments do not have beneficial/functional riffle/pool sequence, meanders or stable bed and bank. They have been impacted by previous soil disturbing activities associated with surface mining activities. The habitat for aquatic life is absent or the quality very low; and there is little evidence of aquatic life in the ephemeral streams.

The on-site mitigation will enhance these resources to support a diversity of biological life. The planned mitigation will consist of the creation of approximately 7,600 linear feet or 0.959 acres of intermittent jurisdictional waters to include stream meanders, riffle/ pool sections in streams. On-site stream mitigation will restore 17,740 linear feet or 1.204 acres of ephemeral jurisdictional streams. This is a total of 25,340 linear feet of improved, highly functional stream segments with buffers in some areas and other properties associated with a high value stream segment. Also, 15,200 linear (50 ft. wide) feet or 17 acres of riparian buffers will be planted along both sides of re-created intermittent stream segments, and where appropriate along ephemeral restored stream segments. Additionally, approximately 1.5 acres of wetland will be restored/created within the project boundary. Also, complete mitigation will establish approximately 2 acres of buffers along the created wetlands within the project boundary.

Description of Aquatic Resources in the Project Area

The boundaries of this project area encompass part of an area that is known as Raccoon Mountain. Approximately 75% of the project area has been previously mined. The mining and other soil disturbing activities have severely impacted the stream segments in this area. There are ten water flow paths observable on topographic sheets within the project boundary and on-site during the field evaluation *(See Tab 1 # for maps showing WFP locations)*. They are classified as ephemeral and intermittent. *Table B* below list additional attributes of streams located in the project area. WFP's 10A, 11A, 17, & 20 are identified as intermittent. A unified description of the intermittent streams is listed in *Table A* below. WFP # 20 is a reconstructed/created stream segment. It flows along the drainage ditch of an access road for several hundred feet. The lower reach is immediately adjacent to the access road and the bed and bank is mainly parent rock or large fractured pieces of rock from the mining operation. The water source for this stream is excess water from the deep mined areas and the accompanying ponded areas. WFP's 10A, 11A & 17 lower reaches are mined through stream segments. Drainage water is mainly flowing through and over residual mine spoil. The bed and banks of these stream segments are not continuous. The source of water for these segments is seepage springs and deep mined areas that were excavated to underground water levels. The field investigation observed there is a

connection to Hale Creek. WFP's 16 and 21 are identified and classified as ephemeral streams. WFP 16 is an ephemeral drain in an area where there is slight soil disturbance. This segment has identifiable bed and bank. WFP 21 is an ephemeral stream segment in an area with significant soil disturbance. This upper reach stream segment is impacted by an access road and excessive sediment along the channel from erosion in the water shed.

WFP's 1, 2, 18 and 19 are ephemeral drainageways. They will be mined through during the coal excavation process. The segments are located above several feet of high walls. The drainage water from these segments flows down the side of the high walls at varying points.

There are 4,260 linear feet or 0.207 acres of intermittent stream segments. There are 4,180 linear feet or 0.139 acres of aquatic resources identified as ephemeral streams.

There are 1.9 acres of wetlands identified and delineated within the project boundary. The wetlands were mainly created during the previous mining operation by altering the surface and subsurface hydrology. They are located along the edges and shallow water areas of ponds/collection basins created during the previous mining operation. Additionally, wetlands are located in depressional areas and remnants of drainageways. The wetland vegetation is mainly sweet gum, yellow poplar, and shrub type plants. The hydroperiod for the wetland areas are sustained by the overflow of drainage from pond/collection basins in the area. The lower elevation of the basins is located below the ground water level and they have a constant near full pool during the wet season of the year.

There are non jurisdictional water flow paths within the project boundary. They do not exhibit bed and bank characteristics. The drainage water flows down slope in a sheet configuration similar to water flowing across an upland concave landscape position. Also, observation of these drainage water courses indicates there are no significant changes in soil and vegetation type from the adjacent uplands. Typical on-site photographs of these water flow paths are located under Tab 3 of this document.

Table A - **Channel ID** **Channel Condition**

WFP 10A	Severe
WFP 11A	Severe
WFP 17	Severe
WFP 20	Severe

Alternative Analysis

Cedar Lake Mining, Inc. is planning to "Surface Area Mine" several acres in Blount County, Alabama. The company is aware of the environmental impacts this project will have on the aquatic resources in the project area and the possibility of off -site impacts. Section 404(b)(1) guidelines states that "<u>no discharge of dredged or fill material shall be permitted if there is a practical alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences".</u>

Their intent is to properly mine/extract the coal reserves below the surface through safe and acceptable environmental practices. To arrive at the safest and best environmental activities for this mining operation, the company analyzed several options and factors to determine the most practical alternative for this mining operation. Section 404(b) states that "An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes". The selected alternative will have the least adverse impact on the environment.

The following is a list of alternatives for this operation:

- No action alternative
- Alternative site location for the project is considered.
- Mining methods alternatives
- Mine the area in such a manner that aquatic resource within the project boundaries will not be dredged or filled.
- Mine the area in such a manner that dredged of fill material will not enter waters of the United States.
- Strategically manage and controls dredged and fill material containing potentially harmful contaminants

1. No Action Alternative

The No Action Alternative is the frame work/basis for the evaluation of all other alternatives. The no action alternative is viewed as a natural progression of activities accompanied by man induced activities such as logging, road building and activities associated with recreation. These activities will impact the aquatic resources in measurable amounts. There will be impacts to the aquatic resources in the project area even if the proposed project is not implemented with the best and most feasible alternative.

2. Alternative Site Location

The process of extracting mineral reserves from the earth is a site specific operation. Therefore, the project must be located where reasonable amounts of the mineral has been identified and analyzed. Unlike other surface disturbances such as roads, bridges or residential developments that can be relocated or shifted, the mining of mineral reserves such as coal in this instance, must be physically located where the coal seams have been identified and extraction is economically feasible and practical. Cedar Lake Mining, Inc. carefully analyzed and compared the net benefit of extracting the coal reserves from a relative large acreage, to the possible adverse impacts this operation may have on the adjacent and surrounding environment. After the analysis and comparison, the company decided to remove 357 acres from the original planned mining area. This action was taken to reduce the possible adverse impacts to aquatic resources on site and off

site. The acres that were removed could have been mined but the company decided that to reduce the overall adverse impact to the environment is a greater net benefit than the financial gains obtained from mining the area. The selected project boundary is located in an area where coal has been previously mined. Additionally, geologic exploration of the reserves within the project boundary indicates that the area under consideration for the proposed mining operation has a reasonable amount of coal reserves and that makes this location practical and feasible.

3. Mining Methods Alternatives

There are several coal extraction methods employed by companies throughout the region. Each method has specific and general site conditions for a successful operation. Also, there is great consideration given to impacts to aquatic resources, adherence to state and federal environmental regulations and policies, economic returns on investment, and safety issues associated with each method of mining. Generally, in this region coal reserves are extracted by surface area mining or underground mining.

Underground Mining

The underground/subsurface coal seams are generally too thin for continuous operation of underground equipment, movement of personnel, and other activities associated with this type of coal mining. Even when one seam is thick enough to underground mine this often makes other seams un-mineable.

The composition of the roof at this site is too unsuitable for underground mining at the depth of the coal seams. The overburden above the coal seams is fractured shale rock. The minimum thickness and condition of the surface overburden is unsuitable for safely underground mining of this entire project area.

Surface Area Mining

Surface area mining this coal is the most practical means of extracting these coal reserves. The overburden is not excessively thick. The ratio of coal seam thickness to overburden thickness is financially feasible. The project area will be surface area mined in three increments. The mining will progress from west to east as designed by the mining engineer. This will facilitate the proper handling and piling of overburden material. The mining design will enable the project site supervisor to implement best management practices, control surface runoff and reduce potential off site contamination.

Contour Mining

This type of mining normally occurs where the overburden is excessively thick in high mountainous areas. In these areas it is impractical to remove the overburden to access the entire the coal seam. Contour mining does not allow for complete coal seam recovery. It is practical to remove existing overburden at this site by other methods of mining.

4. Mine the area in such a manner that aquatic resources within the project boundaries will not be dredged or filled

If it were practical the company would mine the project area and not dredge, cut, or fill the streams and wetland resources within the project boundary. There are several linear feet of intermittent and ephemeral stream resources. Their geomorphic locations are very complex. The main channels are parallel flowing from south to north and they are a short distance apart laterally. Additionally, there are several intersecting ephemeral drainage ways and this reduces the upland areas between ephemeral and intermittent drainage ways. Theoretically, these areas could be mined and the excess overburden transported to off sites areas. The areas between and adjacent to these resources are too small for current surface area mining techniques and technology. Transporting overburden refuse off site is too expensive and this would require additional permitting. Mining in such a checker board manner would require many box cuts and thousands of feet of high wall to reclaim and as such is not practical.

5. Mine the area in such a manner that dredged of fill material will not enter waters of the United States

Jurisdictional waters are within the proposed project boundary and there is a large perennial stream in close proximity to the project area (Hale Creek). State regulations prohibit the mining through of perennial streams. The COE requires a permit to dredge or fill in waters of the United States. After careful review and analysis of the pre-mined data in the project area, it was determined that several feet of jurisdictional waters (intermittent/ephemeral) would be mined through, if permitted. This action is necessary because of the method of mining the company uses, economics of the project area and ability to manage off site contamination. However, the company adjusted the project boundaries to reduce adverse impacts to the environment and to Hale Creek. Additionally, several sediment basins and water control structures have been planned and designed to prevent off site contamination of waters of the United States.

6. Strategically manage and control dredged and fill material containing potentially harmful contaminants

During the geologic exploration and site evaluation phase of this mining process, several drill holes were made across the potential site. These borings provided valuable information such as thickness of overburden to coal seams, amounts of harmful chemical elements contained in the overburden and coal reserves, and the amount of beneficial chemical components contained in overburden layers. After the collected data was analyzed the design engineers planned what coal seams would be mined and the seams that would remain unmined. If analysis of the data indicated overburden layers were present with exceptionally high levels of contaminants, the project engineer planned and designed containment and control measures. These measures included procedures to properly seal the material beneath impervious layers to prevent acid mine drainage or placing the material in spoil in a location where they do not come into contact with ground water. Managing potentially harmful contaminants through control or avoidance is an important management decision. This reduces total reliance on sediment basins for preventing off site contamination of waters of the United States.

The Selected Alternative and Rational Analysis

There are approximately 543 acres within the project boundary. It has several linear feet of jurisdictional waters and a few acres of jurisdictional wetlands. These aquatic resources will be filled and or mined through during this planned mining process. The analysis indicates it is more practical to mine through these resources and reclaim on site rather than attempt to conduct mining operations around the intermittent streams and small drainage ways. The most practical method of extracting the coal reserves within the proposed project boundary is "Surface Area Mining". Typically, the surface area mining process begins with the removal of timber and other vegetation, building access roads, drilling and blasting overburden, overburden removal down to seams of coal, coal extraction, re-grading and re-establishing aquatic resources and re-establishing desirable vegetation on-site. All primary and secondary roads and sediment basins will be built as designed by a professional engineer and approved by the appropriate regulatory authority.

To access the coal reserves below the surface, holes are drilled into the overburden, a calculated amount of explosives are then placed at pre-determined depths and ignited. This fractures the rock and other overburden to create "Spoil." This is hauled and graded into existing adjacent pits created during previous mining operations. This process is repeated in predetermined lines called "Cuts" until the seams of coal have been removed. The company is planning to place spoil into several existing pits/dugout areas to reclaim these sites and remove/ reclaim high walls according to state regulation. The reclamation of these deep water collection pools and high walls will improve water quality and enhance aquatic resources in the area.

This method is suitable for this site location because: (1) the coal seams thickness are more suitable for surface area mining, (2) the overburden ration to coal seam thickness is economical and feasible, (3) managing the removal and placement of overburden on site via increments and cuts as designed by the engineer are safe, economical and practical when considering the topography, type of overburden refuse and parameters associated with offsite disposal, (4) potentially harmful overburden intervals are identifiable and manageable to prevent off site contamination, (5) surface runoff and drainage is contained on site by the design and placement of sediment basins and water control structures.

Summary of Adverse Impacts and Planned Mitigation Action

The aquatic resources identified within the project boundary will be mined through during the coal extraction process. The segments will be restored according to an engineered plan and design. The design of the restoration plan will be completed by an engineer and or hydrologist. It will include the grading plan, stream on-site location, degree of curvature to form meanders, slope degree, and cross sectional of streams. These designs will ensure the success of all installed stream structures.

The company is planning to apply all necessary practices that are practical to reduce the impacts to aquatic resources on site and off site. This included avoiding aquatic resources where possible, planning, designing, and installing sediment basins, and following a detailed water quality monitoring plan. Additionally, the planned site reclamation will enhance aquatic resources and improve the habitat suitability for wetland wildlife and upland wildlife.

Information related to Riparian Forest Buffer establishment is available in the *NRCS Conservation Practice Standard* 391(*Riparian Forest Buffer)*. Information related to "Wetland Creation" is available in NRCS *Conservation Practice Standard 658*. For guidance on planting trees, refer to *NRCS* (*Tree Planting*) *Alabama Guide Sheet No. AL 612* (*See Tab # 7 for NRCS Documents*). These documents and other information are available at www.nrcs.usda.gov.

This mitigation document shows:

- There are 8,440 linear feet of jurisdictional waters or 0.346 acres of jurisdictional waters impacted by this mining operation.
  4,180 linear feet or 0.139 acres are ephemeral streams
  4,260 linear feet or 0.207 acres are intermittent streams

- The mining of this site will begin with the removal of trees and other vegetation. The surface and subsurface material will be removed to access the desired coal seams and during this process the jurisdictional streams identified on the project site will be excavated through.

- Planned on-site mitigation will restore/upgrade the 5,320 linear feet or 0.25 acres of intermittent/ephemeral stream segments to 25,340 linear feet or 2.19 acres highly functional/value intermittent segments.
  Intermittent Stream Restoration – 7,600 or 0.959 acres
  Ephemeral Stream Restoration – 17,740 or 1.204 acres

  NOTE: Additional reclamation above required mitigation for impacts to aquatic resources identified on site is optional and implemented for the improvement of safety and water quality

- During the field review and site assessment there were 1.9 acres of jurisdictional wetlands identified and delineated. On-site mitigation will create 1.5 acres of highly functional/value wetland in the project area for the wetlands impacted by this mining operation.

- There are low quality buffers along the stream channels on the proposed mine site. Completed mitigation will establish 15, 200 linear feet (50 ft. wide both sides of segment) or 17.4 acres of riparian buffers along stream channels. Also, approximately 2 acres of riparian buffers will be established adjacent to created wetlands.

There are no threatened/endangered species identified on the project site. There are no historically significant sites located in the proposed mining area. Concurrence letters from the State of Alabama; Alabama Historical Commission, State of Alabama; Department of Conservation and Natural Resources, United States Department of Interior; Fish and Wildlife Service, are contained in this document (*See tab 2 for concurrence letters*).

SITE SELECTION

The mining of this site for the purpose of extracting coal will impact 4,400 linear feet of low quality streams. Most of the segments have been impacted by soil disturbing activities in the watershed of the project area. Some stream segments have been mined through during previous mining operations and the original bed/bank is not readily identifiable. In other areas the bed/banks are unstable; there is sedimentation in areas and shallow depth to rock along the bed of several segments. These segments will be re-established on the proposed mining site in locations suitable for them to function as designed by an engineer and or hydrologist. When mitigation measures are fully established and functioning as planned, the stream flow will provide high quality water, nutrients, and other organics to important off-site waters. The planned mitigation measures, up-graded stream restoration, riparian buffer establishment, and the creation of neighboring wetlands, will create a much improved aquatic environment over the existing situation. On-site mitigation requires proper, timely, and continued monitoring. This creates an opportunity for discovering problems and adverting failures of inadequate construction and improper installation of stream structures.

SITE PROTECTION INSTRUMENT

The owners of Cedar Lake Mining, Inc., Bull Gap Mine will provide adequate mitigation on site as required by the agency. Additionally, the mine owner will purchase wetland credits in an approved wetland mitigation bank in-lieu of other traditional site protection instruments such as a Restrictive Covenant or Conservation Easement.

Proximity factor = 1.49
WRAP Score of 0.538 - Calculating 0.538 x 0.09 acres = 0.0484 x 1.49 = 0.0726 credits to purchase.

BASE LINE INFORMATION

This proposed Bull Gap Mine is located in Sections 8, 9, 16, 17, 18, 19 & 20, T12S, R3E and Sections 24 and 25, T12S, R2E in Blount County, Alabama. Approximately 90 % of the proposed mining project areas have been previously mined. Typically, the landscape is a nearly continuous series of high walls with adjacent drainage water collection areas or pools. Other parts are undulating and steep un-reclaimed spoil areas. Some of the previously mine areas have been reclaimed and have been planted with loblolly pine trees. These areas are low intensity managed commercial forest. There are a few acres of un-mined land in the project area. The landscape consists mainly of narrow sloping ridges with steep side slopes and in some areas the landscape is undulating uplands with moderately sloping to very steep side slopes. The soils on these landscapes are formed in residuum weathered from sandstone and shale of Appalachian Plateau Physiographic Region.

The intermittent stream within the project boundary lacks a well defined floodplain. Drainage water from the northern part of project site flows into Hale Creek, a perennial stream. Drainage water from the southern part of the project areas flows into Bunch Creek, a perennial stream.
The Jurisdictional streams identified and labeled on this project site have bed and bank and or other characteristics associated with these stream types (*See tab 3 for CEO approved JD forms and typical photos of stream segments*). There are several water flow paths in the area that are

not jurisdictional. Drainage along these areas is mainly sheet flow. Most segments of the ephemeral and intermittent streams have been severely altered over time to include excessive sediment deposits in the bed of some stream segments and many stream banks are unstable. Therefore, the surface and subsurface hydrology has been altered as a result of surface site activities.

The project area is mixed hardwood/ pine forest. The vegetation over story is mainly loblolly pin, short leaf pine, sweet gum, assorted oak and yellow poplar. Hydrology for the intermittent streams is seep springs water as a result of deep surface area mining. Overall, suitable habitat for locally adapted aquatic species is very low for this site. Implementing this planned mitigation will greatly enhance the diversity of biota in the project area.

Soil

The Natural Resource Conservation service has prepared a soils map of the area. A review of the soil survey data for Blount County, Alabama indicates the dominant soil types in the project area are Montevallo, Townley, and Palmerdale soils. These soils were identified in the project area. Also, soils mapped as inclusions were identified along drainageways. The soil material along the drainageways is recently deposited alluvium and colluvium.

Montevallo loam

This mapped area consists of shallow, well drained soils formed in residuum weathered from sand stone and shale. Permeability is moderate. The landscapes where these soils are mapped consist of narrow ridges and undulating upland with moderately steep to steep side slopes. Content of coarse fragments ranges from 15 percent to more than 35 percent throughout the profile. The available water capacity is low throughout the soil. Montevallo loam is not identified as a hydric soil but it may have hydric inclusions

Palmerdale channery loam

The soils in this map unit are somewhat excessively drained and they are developing in mine spoil material. Permeability is moderately rapid. The landscape where these soils are mapped consists of sloping areas where reclamation has occurred and steep to very steep high wall and sloping areas where reclamation is planned. The content of coarse fragments ranges from 40 % to 90% throughout the soil profile. Slopes range from 15 to 70 or percent or more. The available water capacity is low for these soils. The potential for erosion is high. Palmerdale channery loam is not identified as a hydric soil. It is considered to have hydric inclusions along flood plains of streams.

Townley silt loam

This mapped area consists of moderately deep, well drained soils formed in residuum weathered from sand stone and shale. Permeability is slow. The landscapes where these soils are mapped consist of broad undulating upland and moderately steep side slopes. Content of coarse fragments ranges from 0 percent to more than 15 percent in some areas. The available water

capacity is medium to high throughout the soil. Townley silt loam is not identified as a hydric soil but it may have hydric inclusions.

Alluvium/Colluvium – (*mapped as inclusion along drainageways*)

These soils are located along drainageways in the project area. This shallow to moderately deep, moderately well drained to somewhat poorly drained, moderately permeable soil formed in alluvial/colluviums material from uplands. Available water capacity is medium to high in the subsoil. The content of coarse fragments in the soil profile is 15 percent to 20 percent. This soil type is not identified as a hydric soil. It is considered to have hydric inclusions along flood plains of streams.

Results of Field Delineation

Uplands

The upland portions of the project site are non-hydric soils as identified by the county soil survey for the project area and confirmed in the field during this investigation. The dominant vegetation in wooded areas is loblolly pine/hardwood with various species of shrub understory. The upland vegetation is mainly FAC and FACU. The soils on the upland are well drained with loamy and clayey subsoil. These soils do not contain distinct mottling or colors with low chroma or low value, therefore, they do not meet the COE criteria for hydric soils. Wetland hydrology is not present on upland sites of the project area. The upland areas do not meet the three criteria used to identify an area as wetland: hydrophytic vegetation, hydric soils and wetland hydrology (*See tab 4 for COE Wetland Determination Form).*

Drainage ways

The drainage way landform consists of narrow flow channels for water. These areas are considered as an inclusion on the county soil survey maps. Several inches of recent alluvial material were observed in many areas along the drainage ways. The soils on this landform are moderately well to somewhat poorly drained. A typical profile consists of 6 inches of yellowish brown (10YR 5/4) loam. The next layer is dark yellowish brown (10YR 4/4) silty clay loam. Below this is light yellowish brown (10YR 6/4) silty clay loam. Some layers have 20 % light brownish gray (10YR 6/2) mottles. Most of these soils do not contain distinct (dominant) mottling or colors with low chroma or low value, therefore, they do not meet the COE criteria for hydric soils. The dominant trees are mainly sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*) and yellow poplar (*Liriodendron tulipifera*). These areas do not meet all three criteria used to identify an area as wetland: hydrophytic vegetation, hydric soils and wetland hydrology. They are dominated by facultative tree species, but lack hydrology and hydric soils, and therefore are not wetlands but are waters of the United States where they have bed and banks.

DETERMINATION OF CREDITS

The project area was reviewed to locate, identify, and define all jurisdictional waters/stream segments within the project area. The completed jurisdictional form is a list of stream segments that are jurisdictional as a result of the site assessment. Stream segments are identified as water flow paths on the project site map contained in this document (*See tab 1 for site maps*). Also, photographs were taken at points along most stream segment (*See tab 3 for photographs of typical stream attributes*).

List of Water Flow Paths in the Project Area that were Inventoried

The tables below list the water flow paths inventoried/identified in the project area for jurisdictional determination.

Table of Inventoried Water Flow Paths

WFP ID	LONG	LAT
1	W86 20.44665	N34 00.11752
2	W86 20.53218	N34 00.1486
10A	W86 21.3225	N33 59.94123
11A	W86 21.20705	N33 59.74207
16	W86 21.4474	N33 59.47982
17	W86 21.58347	N33 59.60672
18	W86 21.63693	N33 59.45853
19	W86 21.7675	N33 59.42488
20	W86 21.96628	N33 59.20787
21	W86 21.69232	N33 59.20273
Impact areas for basins # 002E, 007P, 008P & others where they are JD		

The tables below list the water flow paths inventoried/identified in the project that are Jurisdictional.

Table of Stream Attributes that are Jurisdictional/Ephemeral

WFP ID	EPH LENGTH	EPH WIDTH	EPH ACRES
1	240	0.9	0.004
2	600	1.2	0.016
16	1040	1.9	0.045
18	820	1.5	0.028
19	700	1.2	0.019
21	580	1.8	0.023
Basin 008P impact area	200	0.9	0.004
Total	**4,180**		**0.139**

The tables below list the water flow paths inventoried/identified in the project that are Jurisdictional.

Table of Stream Attributes that are Jurisdictional/Intermittent

WFP ID	EPH LENGTH	EPH WIDTH	EPH ACRES
10A	260	2.1	0.012
11A	640	1.9	0.027
17	620	1.9	0.027
20	2,180	2.3	0.115
Basins 002E & 007P impact areas	560	2.1	0.026
Total	**4,260**		**0.207**

Total Acres of Impacts Associated with this Project

Aquatic Resource	Acres of Impact
Ephemeral	0.139acres
Intermittent	0.207 acres
Wetlands	1.9 acres
Total	**2.25 acres**

Total Acres of Restored Aquatic Resources

Aquatic Resource	Acres of Impact
Ephemeral	1.204
Intermittent	0.959
Wetlands	1.5
Total	**3.66 acres**

The mining and reclamation of this project will provide a 1.41 net acreage gain of aquatic resources for the project area. Additionally, the restored stream resources will have higher function/value over the existing streams that are severely impacted. The restoration of wetlands on-site provides an opportunity to create wetlands that are highly utilized by wildlife, create a suitable habitat for macro invertebrates, and improve water quality to offsite aquatic resources.

Implementation of the Mitigation Plan

Stream restoration 2.16 acres or 25,340 linear feet.
Wetland restoration approximately 1.5 acres. **Total restored aquatic resources + 3.66 ac.**

There are 8,440 linear feet of ephemeral/intermittent streams on the project site. This is approximately 0.346 acres of impact. These aquatic resources will be temporarily lost during the mining operation.

Ephemeral steams were characterized as those having water flow during and immediately after normal rainfall, and in some areas there is hydrophytic type vegetation. Intermittent streams are characterized as having water flow for several weeks during the rainy season, have bed and bank and some hydric soil characteristic in the bed of the stream. Hydrophytic vegetation is usually present along the stream banks.

The total of the adverse impacts associated with this mining project is 12,729 required mitigation credits for intermittent streams. Calculations were made using the "Adverse Impact for Riverine Systems Worksheet" (*See tab 5 for worksheet calculations*). Stream characteristics were observed and noted during the survey of the project area for completion of the worksheet. There will be a temporary functional loss of the aquatic resources during the mining operation. However, the planned mitigation measures will restore the aquatic resources to a higher value and offset the 12,729 adverse impact credits calculated before mining. A calculated total of 22, 800 mitigation credits will be generated by stream channel/bank restoration. There is a net gain of 10,071 credits. An additional 9,880 credits will be generated by the establishment of riparian buffers along upgraded intermittent stream channels (*See tab 6 for conceptual design)***.**

Unavoidable Impacts for this Operation

All of the jurisdictional aquatic resources identified on site will be excavated through during the coal extraction process. These resources are identified in the Aquatic Table above. Water control structures/sediment basins (ten basins) for this mining projected will be constructed as designed by an engineer and approved by the appropriate regulatory authority. The basins will impact aquatic resources within the project boundary. The acres of impact are included in total impacts. The basins will prevent contamination of waters downstream from the project area during the mining and reclamation activities. The affected aquatic resources within these detention basins will be restored and enhanced to improve water quality and support a diversity of plants and animal wildlife as a result of the mitigation measures required by this plan. The basins will be removed when the mining operation is complete according to the regulatory requirements of the Alabama Surface Mining Commission.

MITIGATION WORK PLAN

The surface area mining process will begin in year 2010 and extend through 2015. Initially, site prep will begin with the removal of trees and other vegetation where necessary for road construction and other mining activities. Roads will be designed and constructed according to basic engineering criteria for the intended use. This includes cut/fill, grading and sloping of

embankments, drainage and surface run-off control. Culverts and other water and sediment control measures will be installed where necessary. These facilities will be installed in a manner which will minimize soil erosion, downstream sedimentation and flooding. These installations will help ensure avoidance of the adverse affects on the aquatic resources, wildlife and other environmental resources.

Sediment basins, dams, and diversions/ berms will be designed, and built according to approved designed plans in predetermined locations to trap sediment and other debris that is likely to move in solution. These sediment and erosion control measures will be installed before the other earth moving activities begin (*See tab 6 for typical in stream structures*).

The mining of coal begins with the removal of overburden. This is accomplished with rotary air drill machinery, blasting devices and earth moving equipment. All suitable soil material will be selected and stockpiled for use in sensitive areas needing vegetation re-established such as the stream buffers. The target coal seam(s) will be recovered after its overburden is removed using mobile equipment. If multiple seams are recovered, all the overburden from the upper most seam from one cut will be removed, and the seam recovered, prior to removing the overburden from underling seam(s). Spoil material will be spoiled down slope and in previously mined open pit areas.

During regrading operations, all underground mine openings encountered will be properly sealed according to regulations. The mined area will be properly regraded, nutrients applied according to regulation and recommendation, and the area revegetated.

Stream channel restoration will begin with designs prepared by an engineer and or hydrologist. It will include acceptable dimensions, patterns and profile for the site (*See tab 6 for conceptual stream mitigation map).* This approach will provide for a stable channel system, capable of transporting sediment, nutrients, and other organics without degrading or destruction of installed channel.

This mining will temporarily affect all aquatic resources on site. The goal of this mitigation, detailed below, will restore the identified aquatic resources to a higher quality for support of a diversity of plant and animal life and improve water quality on site and off site.

The operator has planned projects and conservation practices to mitigate the temporary loss of these aquatic resources due to surface coal mining activities. Mitigating the temporary loss of aquatic resources in the mined area includes improvements in the re-established stream segments such as small riffle pools, bank stabilization, creating meanders and establishing some species of hydrophytic plants along the stream banks where needed. One or more of these types of practices will be installed, where feasible, during or after regrading and shaping the mined area. Re-established stream segments will be constructed so that less erosion will occur over time and this will cause more water infiltration and the reduction of sediment transport.

Hydrologic Monitoring Plan: The mining company has developed a hydrologic monitoring plan as required by regulation. It is designed for monitoring and testing surface and subsurface that may be affected by the mining operation. The sampling test/parameters include Manganese, Iron,

Total suspended solids, pH, and Specific conductance discharge. Information related to the "Hydrologic Monitoring Plan" is located under tab 8 of this document.

The stream channel restoration portion of this mitigation plan, when implemented, will generate 22,800 restoration credits for intermittent streams. The restoration includes the re-establishment and enhancement of intermittent stream segments and upgrading the quality of all ephemeral stream segments. A suggested/draft reclamation map is located in tab 6 of this document.

A Riparian Buffer zone will be stabilized with appropriate grass cover and planted with bare root seedlings within a 50 ft. buffer on both sides of all reconstructed intermittent stream segments. Riparian buffers will be planted along all reconstructed intermittent stream segments and along ephemeral stream segments where feasible. The intermittent streams will be upgraded and site conditions will be suitable for the establishment of native tree species. The riparian buffer restoration will result in the creation of 9,880 credits for this project.

During the re-grading and reclamation activities of this mining operation, the owner will create neighboring/adjacent wetlands similar in size to the wetlands identified before mining. Approximately 1.5 acres of high quality wetlands will be created in the project area.

The existing wetland credit loss (score) for the project is -0.508 credits. When the created wetland areas are fully functional the score will increase to +1.15 credits. This is a credit gain of +0.642

Creation of neighboring Wetlands: During the reclamation and grading phase of the mining operation, small shallow depressions will be made along, or adjacent to, the flow path of the reconstructed intermittent stream segments. The size of these depressions will vary and will be up to 1.11 acres in size. Depth will be variable allowing temporary ponding. These depressions will collect and retain runoff water. They will be vegetated with appropriate plants from the following plant species lists. This will create conditions favorable for the formation of a functional adjacent wetland and wildlife habitat diversity. These areas are on lower slopes of the reclaimed mine area. Maintaining suitable hydrology is possible because of the wetland areas location and the feeder streams. These areas will be appropriately vegetated, hydrated, and maintained to provide favorable conditions/habitat for aquatic plants and animals.

Some of these species will be selected for planting in the wetlands-
Grass Species: Big Bluestem, Bushy Beardgrass, Creeping Spikerush, Eastern Gammagrass, Bermudagrass, Indiangrass, Millet, Fescue, Orchard Grass, Red Clover, Rice Cutgrass, River Cane, Rye Grass, Woolgrass, White Clover, Three Square Bulrush, Switchgrass, Sensitive Fern, Soft Rush, Square Stem Spikerush, Kobe Lespedeza, Vetch.

Tree Species (hard mass): Flowering Dogwood, Chestnut Oak, Bur Oak, Black Walnut, Black Oak, Overcup Oak, Pin Oak, Red Maple, Shagbark Hickory, Shellbark Hickory, Water Oak, and White Oak.

Tree Species (Soft Mass): Loblolly Pine, American Beech, American Elm, Black Willow, Green Ash, River Birch, Serviceberry, Sourwood, Sweet bay, Sweet-gum, Sycamore, Yellow Poplar.

Shrub Species: Alder, Gray Dogwood, Elderberry, Buttonbush, American Witch Hazel, Mountain Laurel, Oak-leaf hydrangea, Persimmon, Red Buckeye, Silky Dogwood, Sweet shrub, Winterberry, Walter Viburnum.

Stream Channel Restoration

Goals: Restore aquatic resources to a higher functional value post mining.

Objective: Design and re-establish stream channels to include meanders, riffle/pool, functional stream profile, proper bank slope and stream bed.

Stream channel restoration will begin with designs prepared by an engineer and or hydrologist. It will include acceptable dimensions, patterns and profile for the site. This approach will provide for a stable channel system, capable of transporting sediment, nutrients, and other organics without degrading or the destruction of the installed channel. Table # 1 below lists some of the design parameters for stream channel restoration.

This mining will temporarily affect all aquatic resources on site. The goal of this mitigation, detailed below, will restore the identified aquatic resources to a higher quality for support of a diversity of plant and animal life and improve water quality on and off site.

The operator has planned projects and conservation practices to mitigate the temporary loss of these aquatic resources due to surface coal mining activities. Mitigating the temporary loss of aquatic resources in the mined area includes improvements in the re-established Non-RPW's such as small riffle pools, bank stabilization, creating meanders and establishing some species of hydrophytic plants along the stream banks where needed. One or more of these types of practices will be installed, where feasible, during or after regrading and shaping the mined area. Re-established stream segments will be constructed so that less erosion will occur over time, and this will cause more water infiltration and the reduction of sediment transport.

The stream channel restoration portion of this mitigation plan, when implemented, will have calculated credits of 22,800 points for the intermittent stream segments. This includes the re-establishment and enhancement of all intermittent stream segments and upgrading some ephemeral stream segments. A suggested/draft reclamation map is located in *tab 6 of this document.*

Planned Stream Restoration Dimensions/Intermittent

Stream ID	**Kind of Stream**	**Length**	**Width**	**Acres**
RSS 1	Intermittent	7,600	5.5	0.959
	Total	**7,600**		**0.959**

Planned Stream Restoration Dimensions/Ephemeral

RSS 2	Ephemeral	2440	3.1	0.173
RSS 3	Ephemeral	1760	2.5	0.101
RSS 4	Ephemeral	2900	3.1	0.206
RSS 5	Ephemeral	1780	2.5	0.102
RSS 6	Ephemeral	1640	2.5	0.094
RSS 7	Ephemeral	4980	3.5	0.400
RSS 8	Ephemeral	2240	2.5	0.128
	Total	17,740		1.204

Table # 1 – Stream design (by hydrologist/engineer) will include the following where required and or possible.

Stream Characteristics	Comments	Maintenance
Bank Slope	Design stream bank slopes for maximum stability based on site characteristic and proper engineering design.	Maintain slope of stream bank as designed by engineer by manually reshaping the stream bank to design criteria and maintaining adequate vegetation that help reduce erosion and stabilize the stream bank.
Channel Dimension	Stream cross-sectional area will accommodate maximum discharge and the functionality to transport normal sediment load.	Clean channel of any material or objects that will block the design flow volume of the stream channel. Manually reshape or grade the channel to designed cross-sectional dimensions.
Stream Pattern	Design and locate stream meanders where appropriate to increase sinuosity and increase resistance to flow.	Design and locate stream meanders where appropriate to increase sinuosity and increase resistance to flow. Evaluate stream channel for excessive erosion on cut-off slope and relocate meanders or add structures to maintain stream stability.
Stream Profile	The longitudinal slope of the stream is designed to maintain sinuosity and the function of riffle and pools.	The longitudinal slope of the stream is designed to maintain sinuosity and the function of riffle and pools. Evaluate stream channel for excessive down cutting of channel and excessive deposition along other parts of the channel. Define the problem such as changes in the watershed and make design corrections to stabilize the channel bed.
Meanders	Calculate and properly locate stream curvatures to accommodate the functionality of riffles and pools.	Evaluate stream meanders for excessive erosion on the cut-off slope and excessive deposition on the slip-off side of the channel flow. Define the problem and relocate meanders if necessary to maintain stream stability.
Riffle-Pool Sequence	Develop these stream characteristics is in relationship to meanders.	Evaluate Riffle-Pool sequence for proper characteristics such as bed material in Pool and Riffle and if functionality has been lost define the problem and re-design the sequence and manually make correction for stream stability.

Performance Standards and Monitoring Plan

- **Restored Stream Segments**

An initial review and site assessment will occur shortly after all mitigation measures are installed. This initial review will evaluate the installation of practices and installed structures as shown on the design plan prepared by the agronomist, hydrologist and engineers. Restored stream segments will be monitored bi-annually for at least five years for compliance with planned design and function. The constructed stream channels will be evaluated for bank stability. The water will be tested for turbidity/water quality including DO, and pH. Additionally, substrate characteristics, erosion patterns and characteristics, cross sectional profile to reference design profile will be documented. If there is excessive down-cutting in the main channel, excessive fine sediment deposits, stream bank erosion and excessive lateral movement of channel, the stream segment will be considered a failure. Additional data will be gathered in any problem areas of the stream segments to determine remedial action and implementation. Then the remedial action will be undertaken to resolve the problem. Biological diversity and the enhancement of water quality are the major goal and measure of success of this mitigation plan. The project area will be evaluated to determine the population diversity of mammals, birds, reptiles and amphibians. This data will be compared to a similar undisturbed site for determination of success or failure. Also, the criterion shown above is listed in tabular form located in Table # 1 and Table # 2.

Table # 2 **Performance Standards Measuring Criteria-Restored Stream Segment**

What	When	Criteria
Stream Channel Dimension	Immediately after practice is installed, Bi-Annually thereafter	Evaluate stream channel for designed cross-sectional properties to insure the channel maintains its functionality. Review the site for excessive bank erosion, sediment transport capacity and other characteristics associated with a stable stream system.
Stream Pattern	Immediately after practice is installed, Bi-annually thereafter	Evaluate the steam flow path for designed sinuosity which includes meanders, riffle and pool sequence of the channel. The movement of water along the designed flow path should not cause excessive erosion along the channel and stream banks.
Stream Profile	Immediately after practice is installed, Bi-Annually thereafter	Evaluate the longitudinal slope of the stream channel for proper gradient. The stream should not degrade or aggrade along the water course and affect other stream properties such as meanders.
Evaluate Water Quality	Bi-Annually	Test for dissolved oxygen, pathogens, heavy metals, turbidity and temperature. If pollutants are identified in the sampling process, action must be taken to meet regulatory water quality standards.
Biological Parameters	Bi-Annually	Diversity of plant and animal is typical for similar site conditions in the immediate surrounding area. From the initial review through 5 years there will be a positive trend in diversity and health of biological life in and along the stream channel. If the trend is negative, appropriate biological specialist should review the site for a determination of failure and develop a plan to improve the site suitability for a diverse biological population.

Quantitative Parameters for Restored Stream Segments

Stream Channel Dimension	Stream channel design will be maintained for at least 90% of calculated linear feet during each Bi-Annual Review.
Stream Pattern	Stream channel will maintain proper sinuosity to include five riffle/pool sequences observed during each Bi-Annual review as per design.
Stream Profile	Stream design profile will be maintained over 90% of calculated linear feet during each Bi-Annual review and have less than 1foot down cutting within each 100 linear feet of stream segment.
Evaluate Water Quality	Random sample water from stream segments and maintains quality as required by ASMC and ADEM.
Biological Parameters	Reestablished aquatic resource supports measurable numbers of frogs, birds, snakes and OBL plants along the designed stream channel.
In Stream Structures	Structures will consist of (if design is applicable/length) 4 areas of random boulder placement, three channel blocks and three wing deflectors if design requires.

Adaptive Management Plan-Restored Stream Segments

- Isolated or large scale failures may be due to several possible causes including changes in the watershed such as topography, land use or vegetation. If restored streams are unstable and there is severe scouring and bank erosion or the designed stream profile is not within tolerance, or if severe stream morphological changes have occurred, the design will be a reviewed and changed. On-site engineering will be implemented to collect data and re-evaluate design plans and specifications. Stream segments may require relocation, a change in design criteria, or simply regrading or modification of the slopes in immediate area.

- If wildlife diversity and water quality are below mitigation standards and not meeting performance standards, the cause will be determined by a qualified specialist and corrective action will be taken. Corrective action may include planting additional suitable species for wildlife forage and cover. To control erosion of stream banks and uplands, more intensive erosion control methods may be necessary. These methods will be selected by a qualified Best Management Practices professional. Corrective actions will be implemented to reduce stream sediment, improve water quality and stabilize the stream segments and the adjacent uplands.

Created Wetlands

Goals: Restore aquatic resources to a higher functional value post mining.

Objective: Design and locate created wetlands to ensure adequate hydrology is provided to the site to support hydrophytic vegetation and aquatic animal life.

During the re-grading and reclamation activities of this mining operation, the owner will create areas of neighboring/adjacent wetlands. Approximately 1.5 of high quality wetlands will be created in the project area. See tables 3A and 3B for design considerations in developing Created Wetlands.

The wetland credit score for the project is -0.508 lost due to mining. Implementing the wetland creation portion of this plan will generate + 1.15 credits. When the wetland areas are fully functional there will be a net gain of + 0.642 credits for the project (*See tab 5 for worksheet calculations).*

Creation of Neighboring Wetlands: During the reclamation and grading phase of the mining operation, small shallow depressions will be made along, or adjacent to, the flow path of the reconstructed intermittent stream segments. The size of these depressions will vary and will be up to 1.11 acres in size. Depth will be variable allowing temporary ponding. These depressions will collect and retain runoff water. They will be vegetated with appropriate plants from the following plant species lists. This will create conditions favorable for the formation of a functional adjacent wetland and wildlife habitat diversity *(See tab 6 for conceptual wetland plans).* Information on vegetation establishment and maintenance is available at www.nrcs.usda.gov.

Table # 3A – Criteria for Created Wetlands

Design Parameters	Comments	Maintenance
Engineer Design the Specifications for the Created Wetland	Design criteria will be based upon acceptable engineering practices and designs for the creation of wetlands. Design at a minimum will include watershed size, basin size and overflow dimensions. Refer to the National Engineering Handbook for the design specifications and guidance when developing plans for "Wetland Creation".	The plans will be available for review upon request especially if there is a failure of the wetlands possibly due to design failure.
Soils, Site, Topography Related to the Function of the Wetland	The site location for the wetland should be thoroughly evaluated and this includes soils, topography and other landscape features. The wetland should be located in landscape positions and on soil types capable of supporting a hydrophytic environment (soils, vegetation, and hydrology).	Review the wetland site for positive or negative contributions to the created wetland. The water shed should maintain adequate vegetation and minimal soil erosion throughout.
Site Hydrology (associated wetland)	The wetland site will be located to receive an inflow of water from a watershed of sufficient (calculated and based on soils infiltration rate and slope of watershed) size and runoff characteristics to maintain wetland conditions in support of soils and vegetation. Additionally, wetland basins will receive recharge from subsurface water due to location as a result of shaping and grading the adjacent watershed (*See conceptual drawing under Tab #6).*	Review water indicators and water levels in the wetland area. Pool should maintain adequate water levels and moisture to support the planned vegetation and begin the development of anaerobic soil conditions. If there is a failure in the design hydrology check the soil substrate –texture, porosity and coarse fragment content. Evaluate the entire watershed for probable cause of failure and design appropriate remediation measures to restore the required hydrology.
Site Hydrology (neighboring wetland)	This wetland site will be located along the banks of intermittent stream segments. This wetland area will receive water from the neighboring intermittent stream via an armored inlet constructed at bank full elevation to allow stream flow water to enter the wetland area each time the intermittent stream flow is bank full. Flowing water will exit the wetland area several feet downstream for the entry point via a constructed armored outlet that allows the water to drain back into the intermittent stream. This creates a flushing situation for the wetland and this improves the quality and functionality of the wetland environment (*See conceptual drawing under Tab #6).*	Review water indicators and water levels in the wetland area. Pool should maintain adequate water levels and moisture to support the planned vegetation. Evaluate the armored inlet/outlets for functionality and stability. If water inflow/outflow is inadequate for the wetland area redesigns the water source and check for other causes of possible failure.

Table # 3B – Criteria for Created Wetlands

Design Parameters	Comments	Maintenance
Vegetation	Establish hydrophytic vegetation suitable for the site after thorough evaluation of site condition. Sweet gum 8' x 12' spacing for seedlings Sweet bay 8'x 12' spacing for seedlings Yellow poplar 8'x 12' spacing for seedlings Soft Rush 12"x 18" rhizomes/seedling Spike Rush 12"x 18" rhizomes/seedlings Button Bush 2'x 2' seedlings	Mechanically control unwanted competition to allow the establishment of desired plant species. Check plants for disease and pest damage and apply appropriate preventive measures to reduce damage to vegetation.
Control Invasive plant Species	There are several invasive plants identified in the region. Observe site for any invasive plant species especially privet.	Employ recommended and approved eradication measures to eliminate and destroy any invasive plant species on site especially along stream channels and those competing with wetland plants.

Table # 4 **Performance Standards and Monitoring Plan-Wetlands**

What	When	Criteria
Wetland Basins	Immediately after practice is installed, Bi-Annually thereafter	Wetland basin will maintain as built design parameters to support functionality of the basin. This includes the designed slope of banks, water depth in basin and inflow/outflow areas are functioning as planned and are not blocked by debris and or sediment from erosion. Over time the objective of "Created Wetlands" is to have diversity and functionality similar to natural wetlands.
Hydrophytic Vegetation	Immediately after practice is installed, Bi-annually thereafter	75% of target of predominant species is the minimum survival for classification as a success. However, it is acceptable if vegetation with similar wetland classification is occupying the site and functionality is not compromised.
Wetland Hydrology	Immediately after practice is installed, Bi-Annually thereafter	Wetland areas are receiving adequate water for the survival of a diversity of plant and animal life. This includes target tree species or substitute for the support of the wetland function. Examination of soil profiles in close proximity to the basins should exhibit hydric properties.
Biological Parameters	Bi-Annually	Diversity of plant and animal is typical for similar site conditions in the immediate surrounding area. From the initial review through 5 years there is positive trend in diversity and health of biological life in and adjacent to the wetland areas. If the trend is negative, appropriate biological specialist should review the site for a determination of failure and develop a plan to improve the site suitability for a diverse biological population.

Quantitative Parameters for Created Wetlands

Wetland Basins	Wetland basins (adjacent/neighboring) will maintain 90% of design criteria including depth, slopes, bank stabilizing material, inflow and outflow of water during each Bi-Annual inspection.
Hydrophytic Vegetation	Vegetation consists of 75% planted species to include 25% OBL, 25% close ground cover plants mainly sedges and rushes along edges of wetland areas. Quantitative requirements for 2- 5 Bi-Annual reviews.
Wetland Hydrology	Hydrology is adequate to maintain basin full/saturated soil for 45 days during the growing season. Supporting evidence includes low chroma colors in the soil profile and hydrophytic vegetation.
Biological Parameters	Reestablished aquatic resources supports measurable numbers of frogs, birds, snakes and OBL plants along the edges of created wetlands.

Adaptive Management Plan-Created Wetland Areas

- If there is severe failure in any critical parameter of the created wetland, the cause of failure will be thoroughly investigated and immediate corrective practices will be applied. The most critical and key element in the success of Created Wetlands is the hydrology. The investigation will begin from the watershed level within the project boundary and extend beyond if necessary, to define and isolate the problem related to hydrology. The problem will be identified and analyzed for properly designed corrective action including relocation of some wetland areas and modifying others.

- If there is severe mortality in the planted tree species, an investigation will review planting techniques, handling of seedling before planting, unwanted competition, disease and pest interference and hydrology of the wetland. Before replanting the cause must be determined and corrected. The problem may be simple —such as altering tree species from OBL to FACW to compensate for changes in site condition of improper site evaluation. If the mortality is the result of disease of pest, changing to a more resistant species may be applicable.

Riparian Buffer Zone

A Riparian Buffer zone will be stabilized with appropriate grass cover and planted with bare root seedlings within a 50 ft. buffer on both sides of all reconstructed intermittent stream segments. Riparian buffers will be planted along all reconstructed ephemeral stream segments where feasible. The intermittent streams will be upgraded and site conditions will be suitable for the establishment of native tree species. The riparian buffer restoration will result in the creation of 3,680 credits for this project. Three to four species of trees will be planted on-site to create a diverse plant population. For this site plantings will consist of Sweet gum (60%), Tulip Poplar (20%), and Red Maple (20%). A total of 454/ac. (8'x12' spacing) will be planted on-site *(See table below for additional planting information and site maintenance).* Also, additional plant species are listed in tables below if other selections are required.

Common species associated with project site (selection for planting on-site)

Common Name	Wetland Status	Site Criteria	Plant Material	Plant Date	Maintenance	Disease/Pest
Sweetgum	FAC	Well drained to Poorly drained, best if rooting depth not limited in soil profile, Ph 6.1-6.5.	Seedlings ¼ root collar	Fall/ winter	Control grasses, and invasive plant species, avoid over story trees and overcrowding for best results	Sweetgum blight, leaf spots, sweetgum webworm, caterpillars, cottony-cushion scale, sweetgum scale, and walnut scale.
Tulip Poplar	FAC	Deep, moderately well drained, medium texture soils, ph 4.5 – 7.0.	Seedling ¼ root collar	Fall/winter	Control grasses, and invasive plant species, avoid overcrowding, thin to maintain adequate spacing	nectria canker, fusarium canker
Red Maple	FAC	Wide range of site conditions, including hydric soils, low tolerance for alkaline soil conditions	Seedlings	Fall/winter	Control grasses, and invasive plant species, avoid overcrowding, thin to maintain adequate spacing, avoid mechanical injury	butt rot, trunk rot fungi, heart rot, and stem diseases
American Sycamore	FACW	Moderately well drained soil conditions, some wet sites, best on loamy soils, tolerate clay soils , requires good sunlight for adequate growth	Seedlings, seeds in flooded areas	Fall /winter	Do not burn especially young trees,	anthracnose and eastern mistletoe

Shrub Species

Common Name	Scientific Name
Alder	*Alnus serrulata* (Aiton) Willd.
Gray Dogwood	*Cornus racemosa* Lam.
Elderberry	*Sambucus canadensis L*
Button Bush	*Cephalanthus occidentalis L.*
American Witch Hazel	*Hamamelis virginiana* L.
Mountain Laurel	*Kalmia latifolia* L.
Oakleaf hydrangea	*Hydrangea quercifolia* Bartram
Persimmon	*Diospyros virginiana* L.
Red Buckeye	*Aesculus pavia* L. var. *pavia*
Silky Dogwood	*Cornus amomum* Mill.
Sweet shrub	*Calycanthus floridus* L.
Winterberry	*Ilex verticillata* (L.) A. Gray
Walters Viburnum	*Viburnum nudum* L. var. *cassinoides* (L.)

Grass Species

Common Name	**Scientific Name**
Big Bluestem	*Andropogon gerardii* Vitman
Bushy Beardgrass	*Bothriochloa laguroides* (DC.) Herter
Creeping Spikerush	*Eleocharis fallax* Weath.
Eastern Gamagrass	*Tripsacum dactyloides* (L.) L.
Bermudagrass	*Cynodon dactylon* (L.) Pers.
Indiangrass	*Sorghastrum nutans* (L.) Nash
Millet	*Panicum miliaceum* L. ssp. *miliaceum*
Fescue	*Schedonorus phoenix* (Scop.) Holub
Orchard Grass	*Dactylis glomerata* L.
Red Clover	*Trifolium pratense* L.
Rice Cutgrass	*Leersia oryzoides* (L.) Sw.
River Cane	*Arundinaria gigantea* (Walter) Muhl. ssp. *gigantea*
Rye Grass	*Lolium temulentum* L.
Woolgrass,	*Scirpus cyperinus* (L.) Kunth
White Clover	*Trifolium repens* L.
Three Square Bulrush	*Schoenoplectus pungens* (Vahl) Palla obl
Switchgrass	*Panicum virgatum* L. var. *virgatum*
Sensitive Fern	*Onoclea sensibilis* L.
Soft Rush,	*Juncus effusus* subsp .Solutus
Square Stem Spikerush	*Eleocharis quadrangulata*
Kobe Lespedeza	*Kummerowia striata*
Vetch	*Vicia sativa L.*

Tree Species (hard mass)

Common Name	Scientific Name
Flowering Dogwood	*Cornus florida* L.
Chestnut Oak	*Quercus prinus* L.
Bur Oak	*Quercus macrocarpa* Michx
Black Walnut	*Juglans niger L.*
Black Oak	*Quercus velutina* Lam.
Overcup Oak	*Quercus lyrata* Walter
Pin Oak	*Quercus palustris* Münchh
Red Maple	*Acer rubrum* L.
Shagbark Hickory	*Carya ovata* (Mill.) K. Koch
Shellbark Hickory	*Carya laciniosa* (Michx. f.) G. Don
Water Oak	*Quercus nigra* L.
White Oak	*Quercus alba L.*

Tree Species (Soft Mass)

Common Name	Scientific Name
Loblolly Pine	*Pinus taeda* L.
American Beech	*Fagus grandifolia* Ehrh
American Elm	*Ulmus americana* L.
Black Willow	*Salix nigra* Marsh
Green Ash	*Fraxinus pennsylvanica* Marsh.
River Birch	*Betula nigra* L.

Tree Species (Soft Mass)

Common Name	Scientific Name
Serviceberry	*Amelanchier arborea*
Sourwood	*Oxydendrum arboreum.*
Sweet bay	*Magnolia virginiana* L.
Sweet gum	*Liquidambar styraciflua* L.
Sycamore	*Platanus occidentalis* L.
Yellow Poplar	*Liriodendron tulipifera* L.

Performance Standards and Monitoring Plan

- **Riparian Buffer Zone**

An initial review and site assessment will occur shortly after all mitigation measures are installed. The monitoring will document the variety of trees planted for site suitability, planting density and correct method of planting, seeding rates of planted grasses and other vegetation, proper mulching material and amounts. As the mitigation site becomes fully established, an assessment is made to determine the survival rate of trees planted in buffer zones. The initial survival rate should be > 75% of the number of planted trees by species. After three years, the required survival rate of 320 trees per acre must be met. Additionally, 10% maximum mortality will be acceptable in years four and five for a base survival of 260 trees per acre for target species. If survival standards are not meet, replanting will be required. Biological diversity and enhancement water quality are the major goal and measure of success of this mitigation plan. The project area will be evaluated to determine the population diversity of mammals, birds, reptiles and amphibians. This data will be compared to data of a similar undisturbed site for determination of success or failure.

Quantitative Parameters for Established Buffer Zones

What	When	Criteria
Initial site review	Immediately after practices are installed	Site visit to review installed practices, type, number, and kind of vegetation established in the project area. Tree species in the buffer zone must be planted at a rate of 454 seedlings per acre. Upland sites must be properly vegetated with approved grasses and engineered erosion methods applied where needed.
Plant survival	1st – 3rd year **Bi-annually**	>75% survival of planted and or acceptable native volunteer tree species. If < 75% survival during plot check, survival is considered a failure and replanting is required after determination of failure
Plant survival	4th – 5th year **Bi-Annually**	A 10% mortality of surviving trees is allowed in year 4. If >10% mortality has occurred, the plot is considered a failure and replanting is required. An additional 10% of surviving trees is allowed in year 5. If >10% mortality has occurred the plot is considered a failure and replanting is required. At the end of the monitoring period of 5 years, 262 trees per acre is the minimum survival acceptable for success. If not, the mitigation plan must be reviewed and a determination of failure documented. A replanting plan must be implemented.
Upland site	1st year through permanent establishment **Bi-Annually**	Upland sites will be seeded to adaptable species on graded slopes. There is no excessive gully, rill, or sheet erosion on slopes. If excessive erosion is occurring the area/site will be regarded and seeded to adaptable species for the site condition.

Adaptive Management Plan

- **Riparian Buffer Zone**

The following adaptive management will be implemented if there is failure during the monitoring period and interim actions or plans have failed the following will occur:

- If there is excessive mortality in tree species along the riparian buffers or other tree vegetated areas, the cause will be determined and corrective action taken such as changing species to a more site specific plant species. To improve opportunity for success, evaluate the benefit of replanting different seedling type and size (bare root vs. container) and determine if the failure is due to predator activity and if so, change tree species to a more undesirable type for the active predator, put in tree guards or control the predators as a last resort.

- If there is excessive erosion or bare soil on slopes where close growing vegetation is established, the site will require an intensive investigation to determine cause of failure. Corrective action may include regrading and reconfiguring slopes, changing grass species, spot liming and fertilization and the use of sod instead of seeding.

- If wildlife diversity and water quality are below mitigation standards and not meeting performance standards, the cause will be determined by a qualified specialist and corrective action will be taken. Corrective action may include planting additional suitable species for wildlife forage and cover. To control erosion of stream banks and uplands, more intensive erosion control methods may be necessary. These methods will be selected by a qualified Best Management Practices professional. Corrective actions will be implemented to reduce stream sediment, improve water quality and stabilize the stream segments and the adjacent uplands.

Maintenance Plan for the Project Site

This mitigation maintenance plan will be implemented as part of the Performance Standards and Monitoring activities for this mitigation plan. Maintenance activities will occur when the installed practice for the restoration of aquatic is classified as a failure. Failure occurs when a practice or action fail to meet specific criteria stated in the performance standards. Also, maintenance activities will be implemented to prevent the failure of a practice. The kind of maintenance action will depend upon the practice and the site condition at time of discovery. The reviewing persons will evaluate the current condition/ site situation based upon specific criteria stated in the performance section of this document. Observations should include the kind of practice and the reason for failure. A maintenance plan shall be prepared to correct the problem. If there is mass or system failure, the monitoring cycle for the failed projects begins anew the year the corrective action is complete.

Long Term Management Plan

The owners of Cedar Lake Mining, Inc. will be responsible for the long term management of this compensatory mitigation site after performance standards have been successfully met. The land will then be used and managed primarily for wildlife. This particular mitigation site will be self sustaining because of the site location, detail planning with consideration to all site conditions, the selection of site specific practices, and installation/implementation of the mitigation plan. The created riparian buffers and other sensitive areas will have limited access to avoid damaging the aquatic resources on the site. If circumstances occur to cause a failure of an installed practice, the owners are responsible for obtaining qualified personnel to evaluate the failure and devise a plan of action to correct the problem. Then the prescribed corrective action will be implemented by the owners. They will be responsible for all financial cost associated with maintaining and managing this compensatory mitigation site long into the future.

Financial Assurance

Cedar Lake Mining, Inc. will present financial documents to the District Engineer to ensure sufficient funds are available to successfully complete the instillation and monitoring phase of this compensatory mitigation and to ensure all performance standards are achieved. Officers of this company will prepare and submit to the COE an itemized cost of services and supplies for the completion of this project

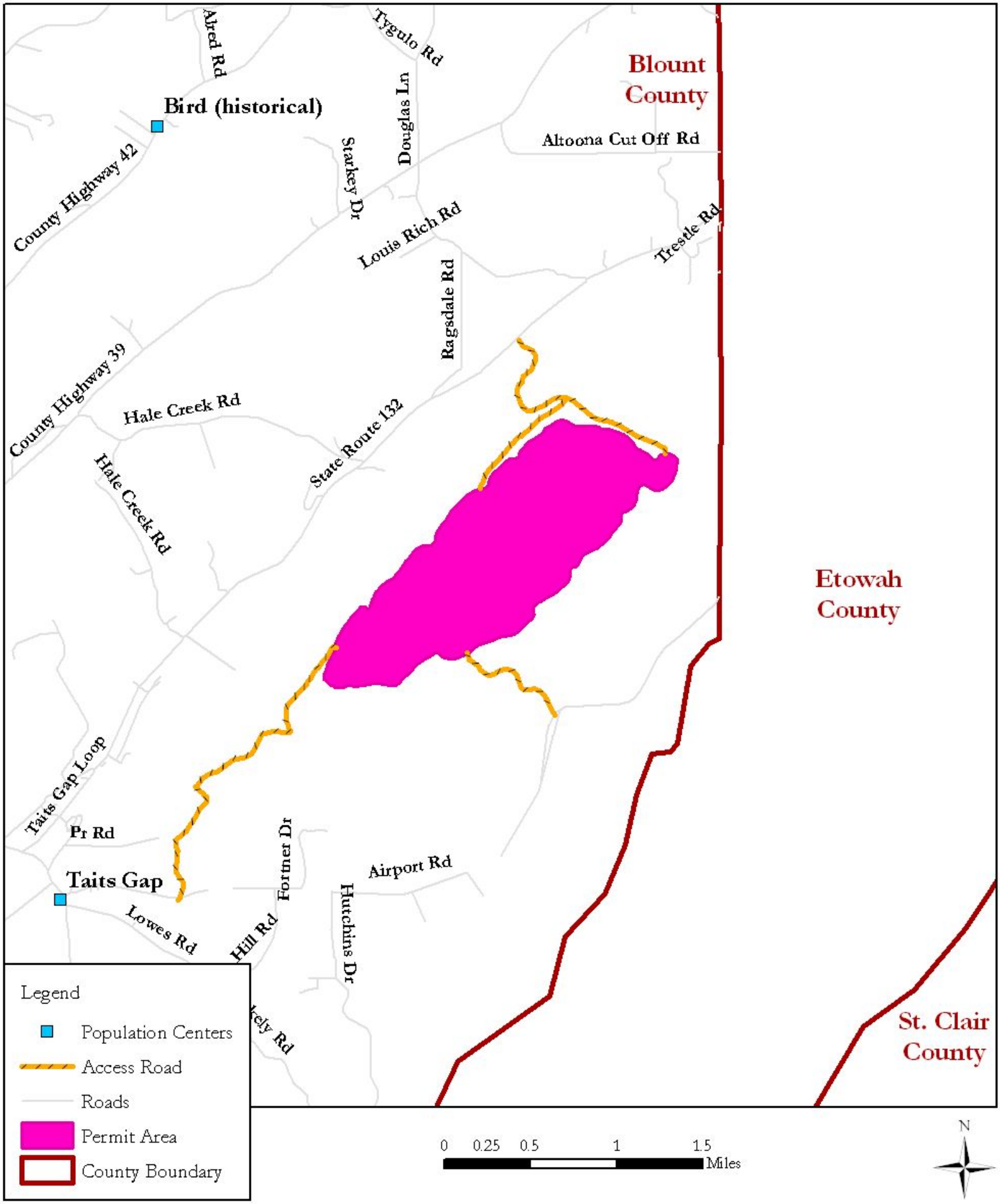
Projected Compensatory Mitigation Cost for Cedar Lake Mining, Inc.			
Site Preparation			
Description/Work Item	Unit Cost/Acre	Project Cost	Total Cost
Engineer/hydrologist design (as built) the stream channel dimension including depth, location, width, bank slope, degree of curvature, placement of structures such as wedge dams, riffle and pool locations, hydrology of created wetland, other engineering functions to insure the success of this mitigation plan.		$20,000.00	$20,000.00
Machine grading and shaping (soil) stream channel, created wetland, and grading and shaping adjacent uplands.(50 days x$2,000/day)		$100,000.00	$100,000.00
Purchase and plant approximately 8,626 (19 + ac. including wetland species) seedlings: selected species adapted for the site/soil condition, shrubs, grasses, trees for wetland areas (including area around wetlands).	$1000.00/1000(including planting)	$8,626.00	$8,626.00
Control and or manage unwanted vegetation in the planted buffer areas and wetland areas (three years).	$200.00/ac. x 19 ac. x 3yrs.	$11,400.00	$11,400.00
Monitoring & reports, each year for five years	$100.00/ac. x 19 ac. x 5yrs.	$9,500.00	$9,500.00
Purchase trees to replant due to mortality (20%), adaptive management 20% for area. (1,738 trees)	$1000.00/1000	$1,739.00	$1,738.00
Total Estimated Cost		$151,265.00	$151,265.00
Contingency Fee (10%)		$15,126.50	$15,126.50
Suggested Amount of Financial Assurance			**$166,391.50**

Alabama
Blount County
July 2010

Cedar Lake Mining Company, Inc.
Bull Gap Mine

Vicinity Map

Altoona DOQ
Hyatt Gap DOQ
S8, 9, 16 - 19 T12S R3E

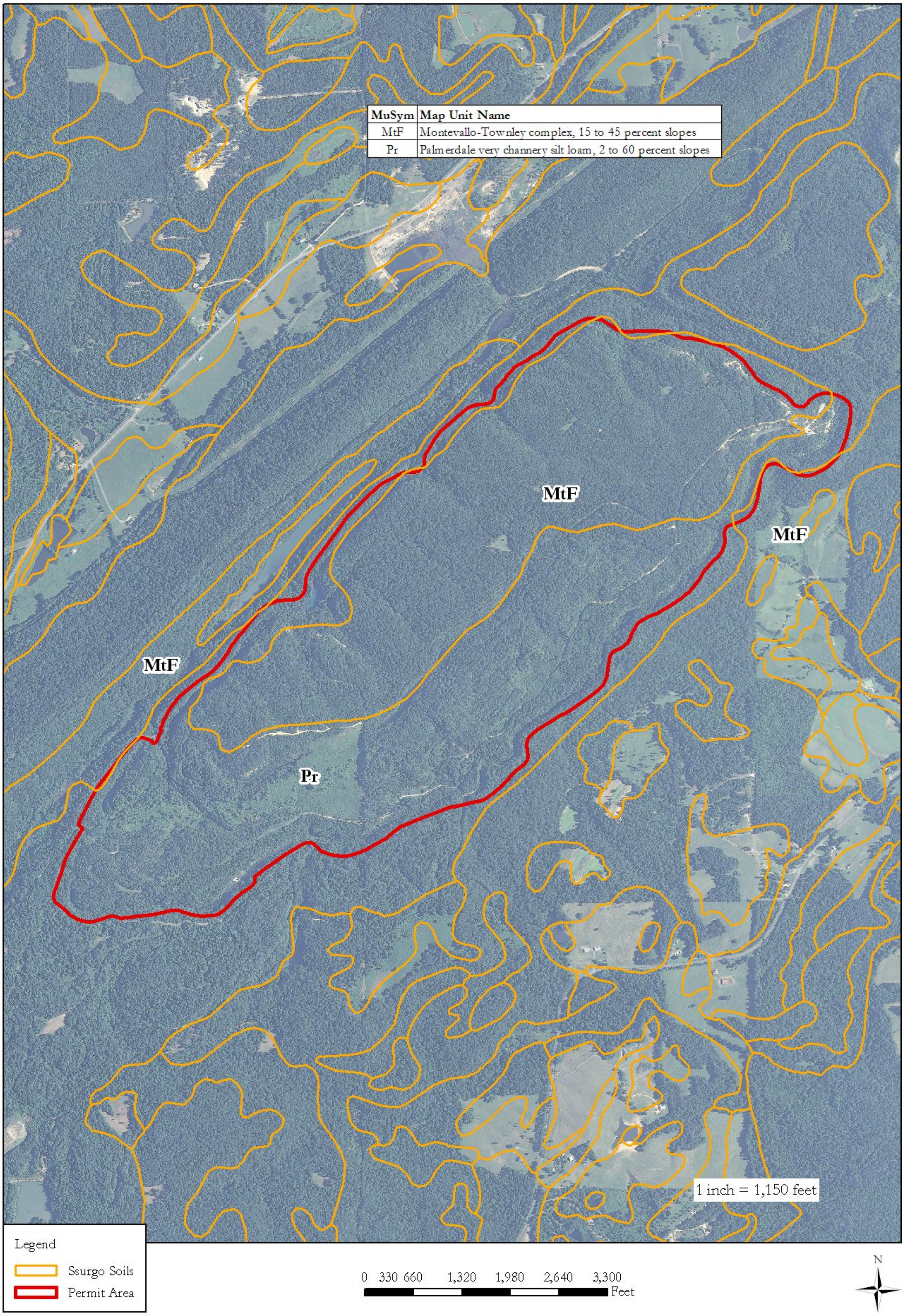


Alabama
Blount County
April 2010

Cedar Lake Mining Company, Inc.
Bull Gap Mine

Soils Map

Altoona DOQ
Hyatt Gap DOQ
S8, 9, 16 - 19 T12S R3E



MuSym	Map Unit Name
MtF	Montevallo-Townley complex, 15 to 45 percent slopes
Pr	Palmerdale very channery silt loam, 2 to 60 percent slopes

Alabama
Blount County
June 2010

Cedar Lake Mining Company, Inc.
Bull Gap Mine

Plan Map

Altoona DOQ
Hyatt Gap DOQ
S8, 9, 16 - 19 T12S R3E

Water Flow Path Origin			
WFP ID	Longitude	Latitude	Length (Ft)
1	W86 20.44665	N34 00.11752	240
2	W86 20.53218	N34 00.1486	600
3	W86 20.73807	N34 00.17845	460
4	W86 20.72652	N34 00.08653	960
5	W86 20.90743	N34 00.17378	500
6	W86 20.9521	N34 00.1601	420
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4	W86 22.03483	N33 59.41975
5	W86 21.67707	N33 59.6677
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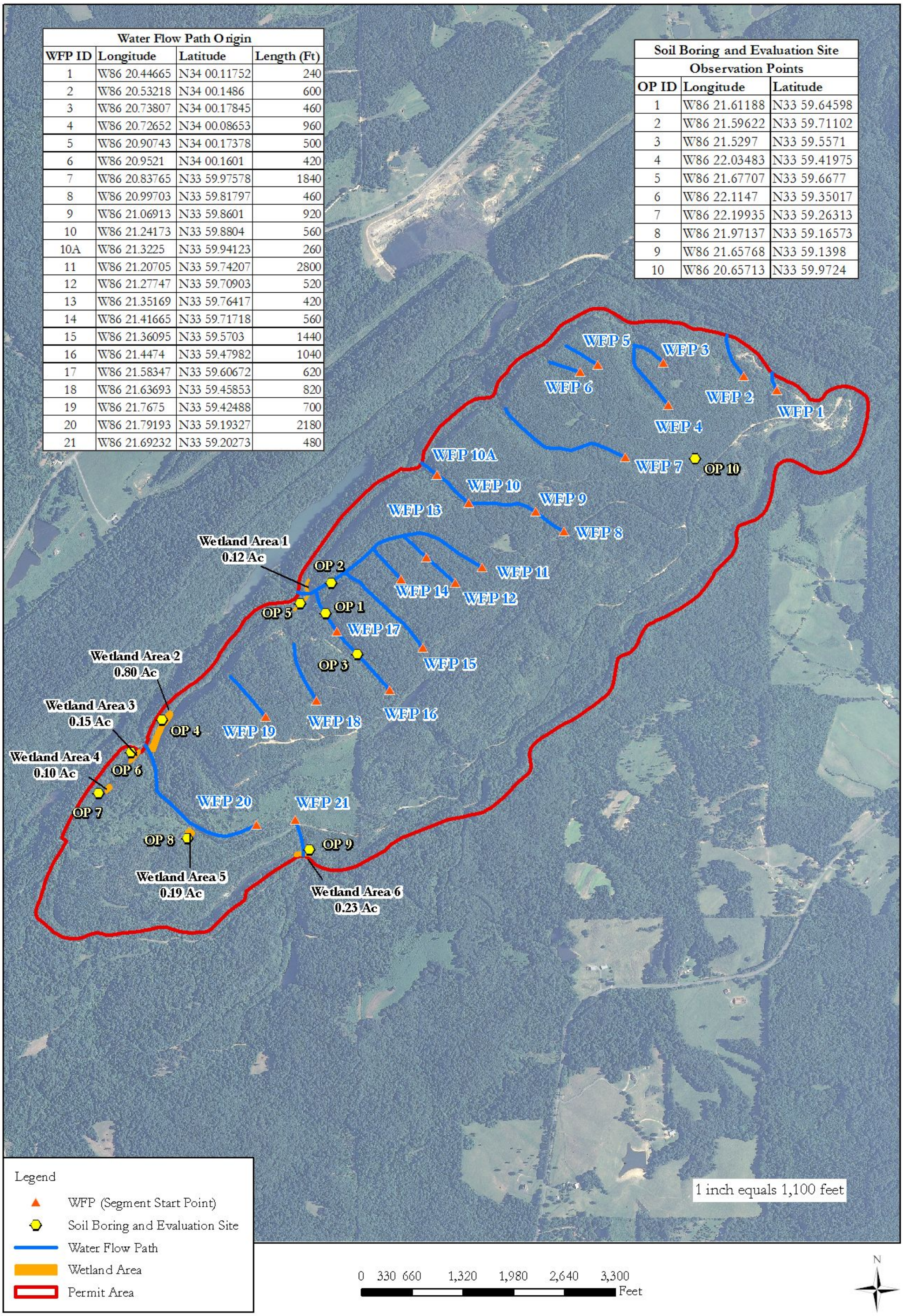

Alabama
Blount County
June 2010

Cedar Lake Mining Company, Inc.
Bull Gap Mine

Topographic Map

Altoona DOQ
Hyatt Gap DOQ
S8, 9, 16 - 19 T12S R3E

Water Flow Path Origin			
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1	W86 20.44665	N34 00.11752	240
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11A	W86 21.53832	N33 59.74835	640
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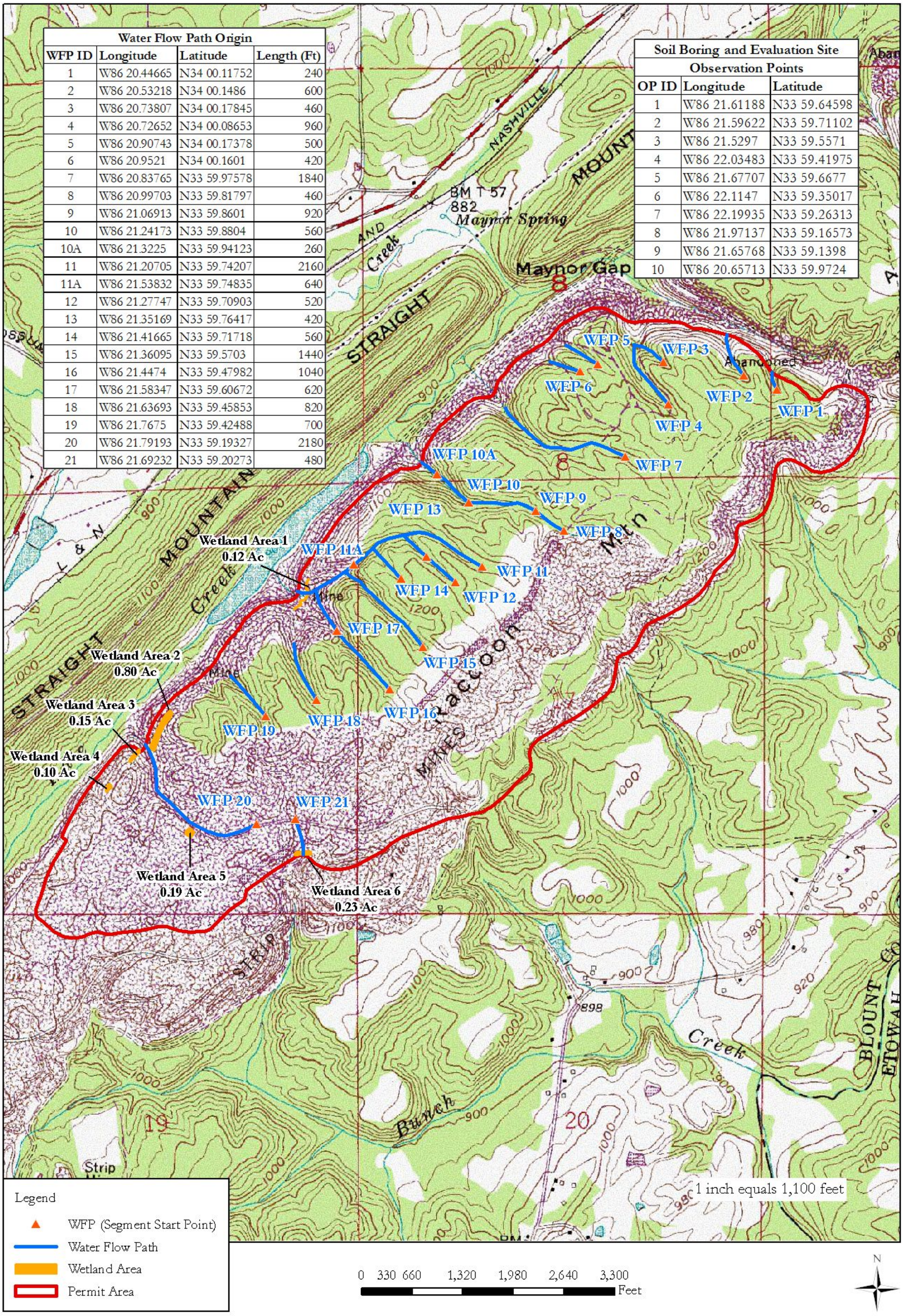


Legend

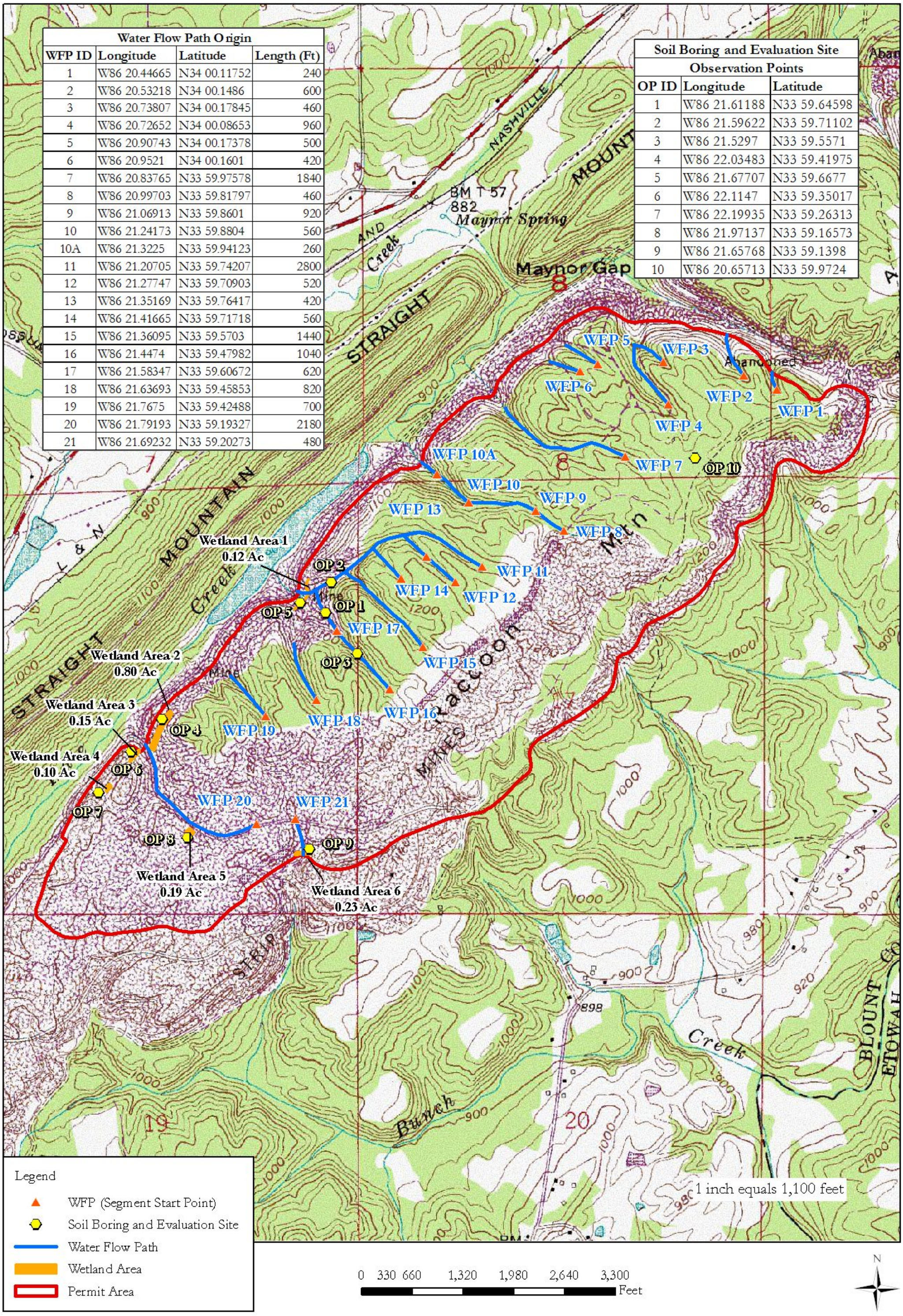
- WFP (Segment Start Point)
- Water Flow Path
- Wetland Area
- Permit Area

Alabama
Blount County
June 2010

Cedar Lake Mining Company, Inc.
Bull Gap Mine

Topographic Map

Altoona DOQ
Hyatt Gap DOQ
S8, 9, 16 - 19 T12S R3E



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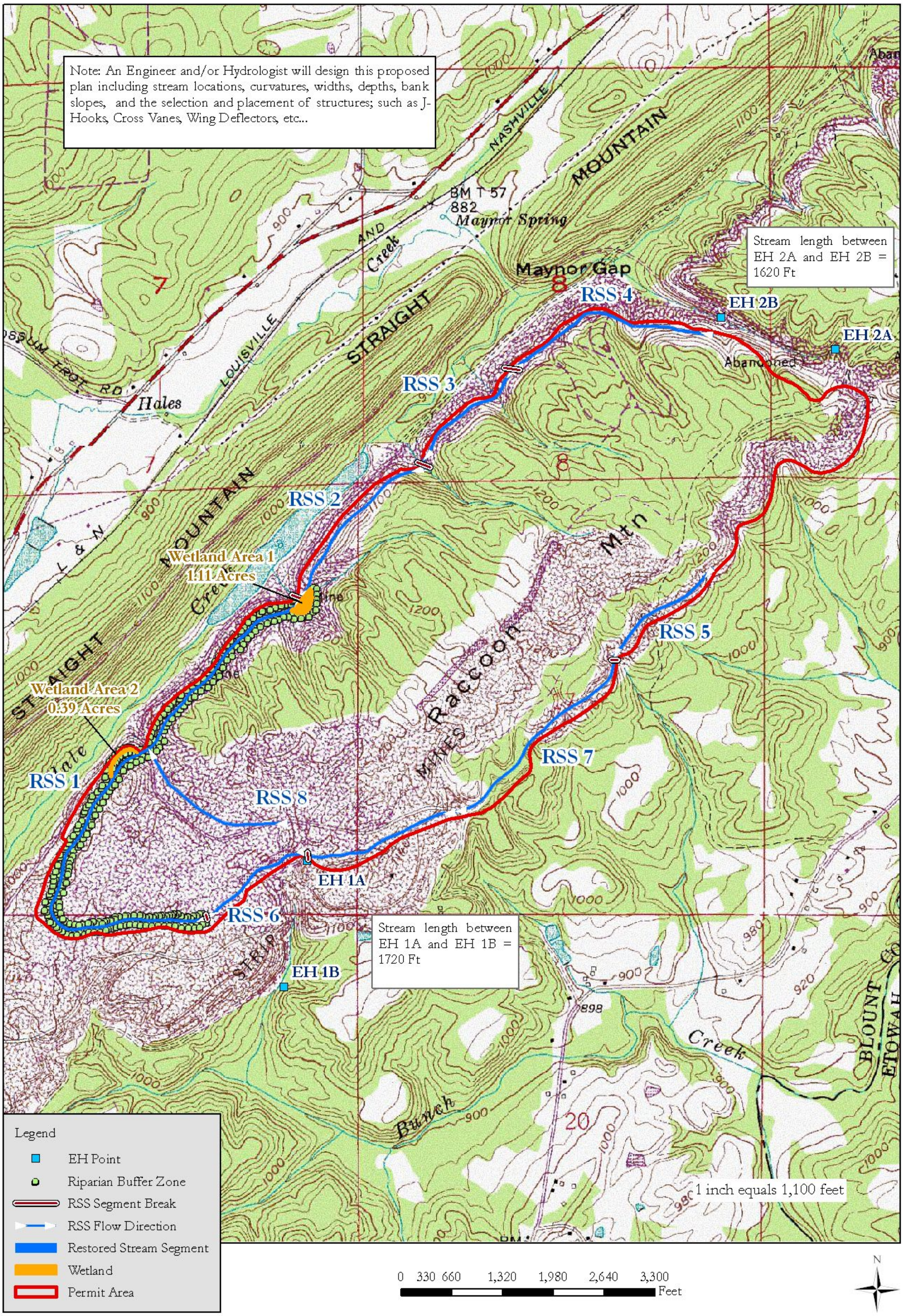
Alabama
Blount County
June 2010

Cedar Lake Mining Company, Inc.
Bull Gap Mine

Reclamation Map

Altoona DOQ
Hyatt Gap DOQ
S8, 9, 16 - 19 T12S R3E

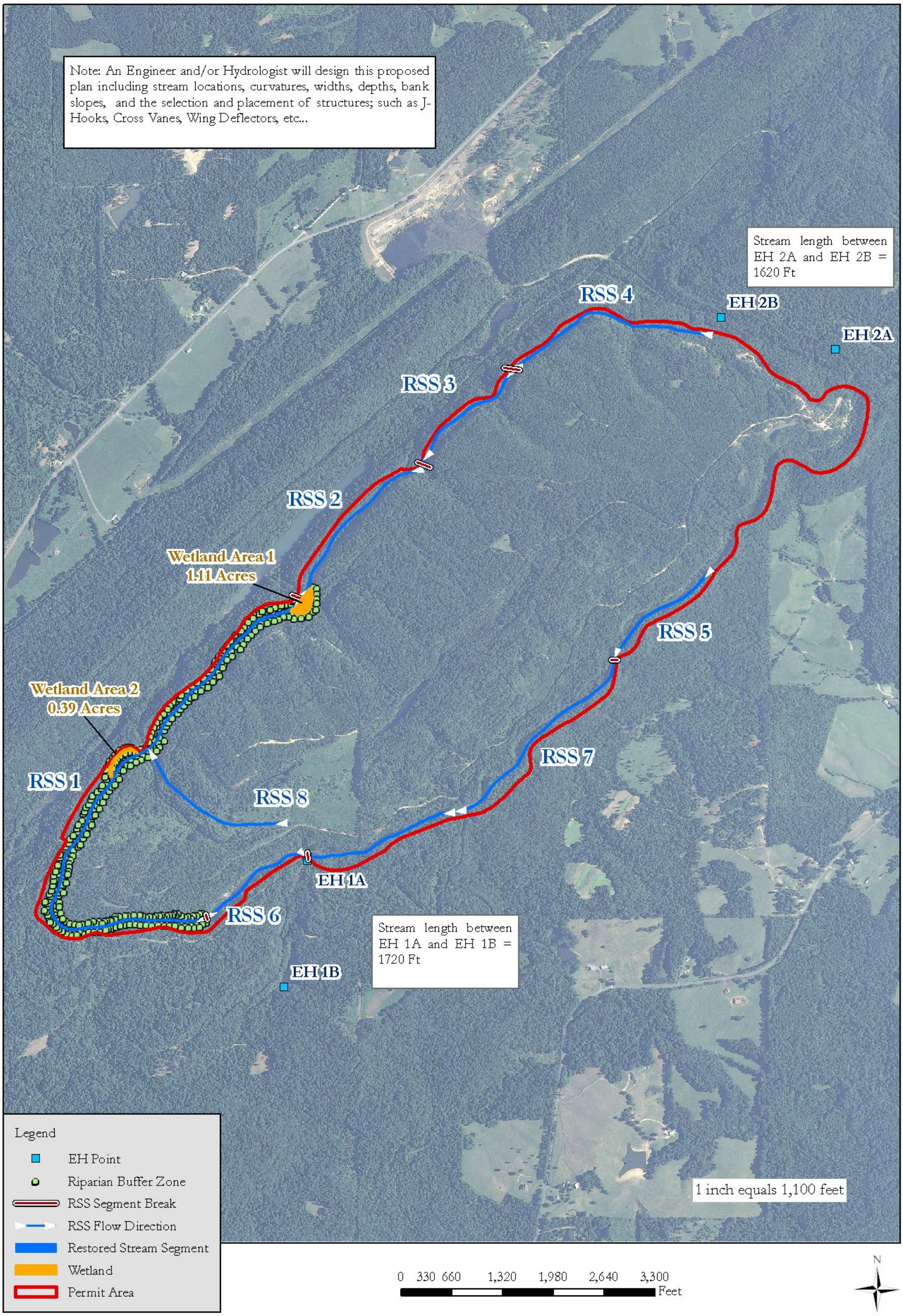


Alabama
Blount County
June 2010

Cedar Lake Mining Company, Inc.
Bull Gap Mine

Reclamation Map

Altoona DOQ
Hyatt Gap DOQ
S8, 9, 16 - 19 T12S R3E

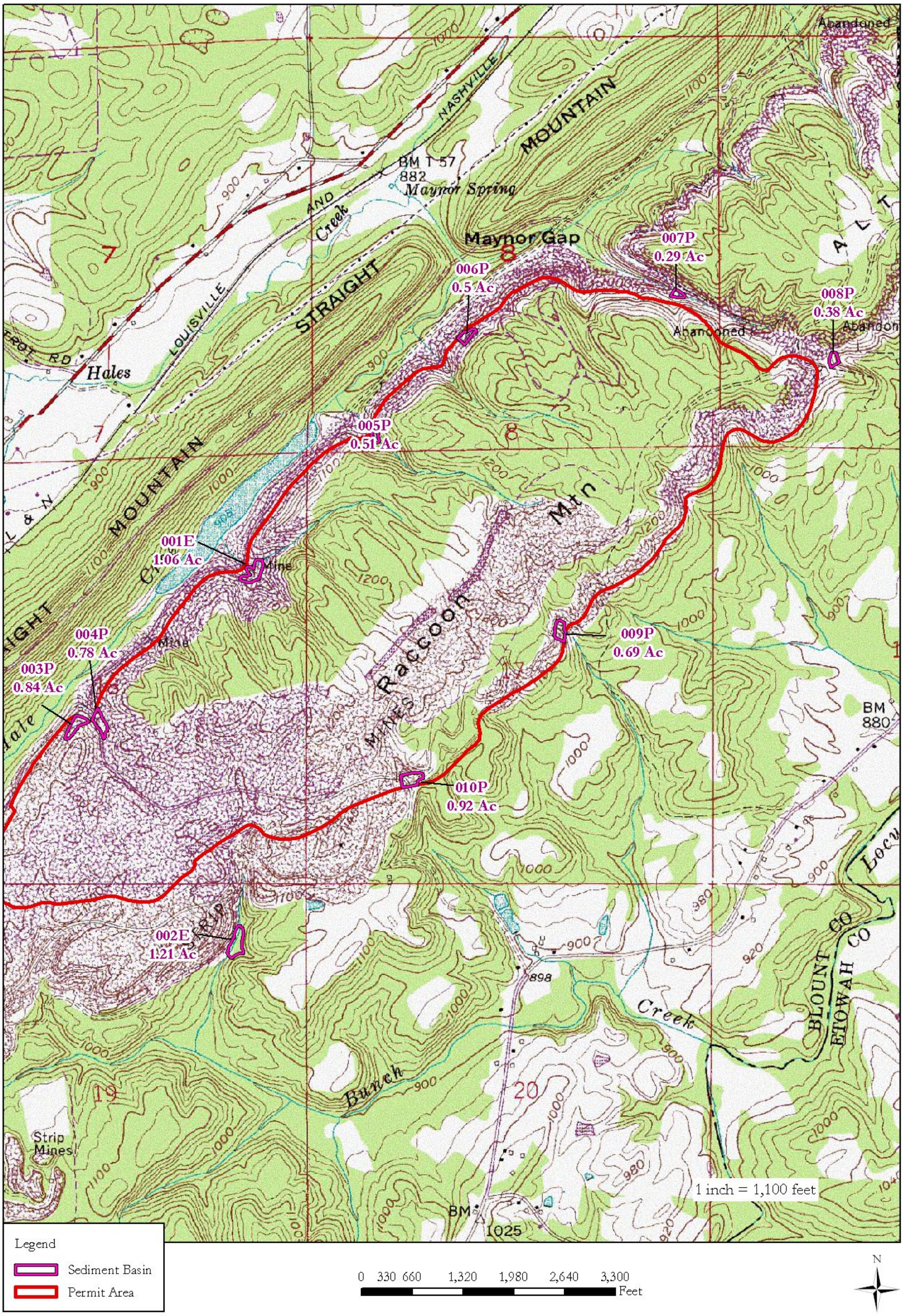


Alabama
Blount County
April 2010

Cedar Lake Mining Company, Inc.
Bull Gap Mine

Sediment Basin Map

Altoona DOQ
Hyatt Gap DOQ
S8, 9, 16 - 19 T12S R3E



Alabama
Blount County
June 2010

Cedar Lake Mining Company, Inc.
Bull Gap Mine

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Altoona DOQ
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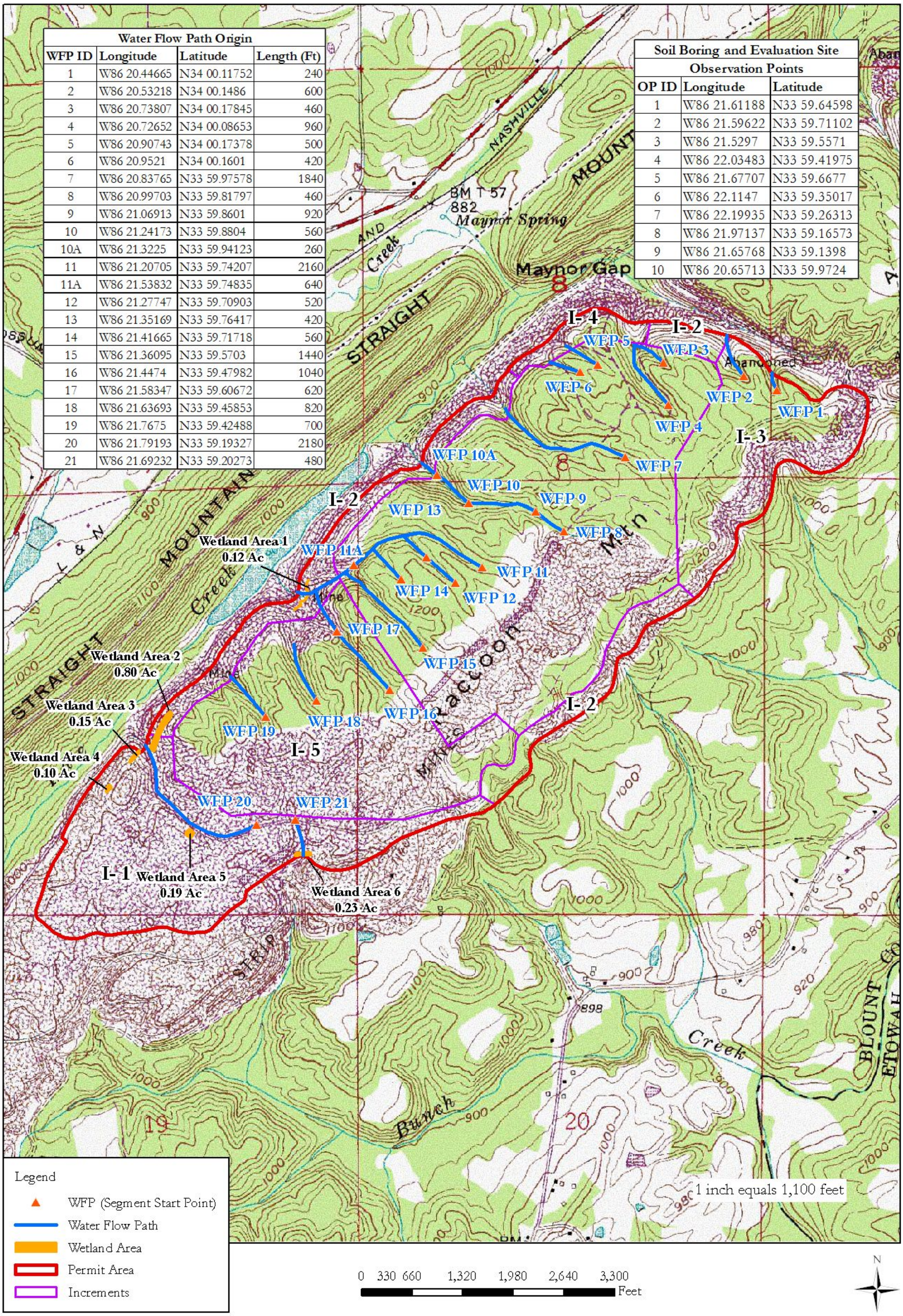
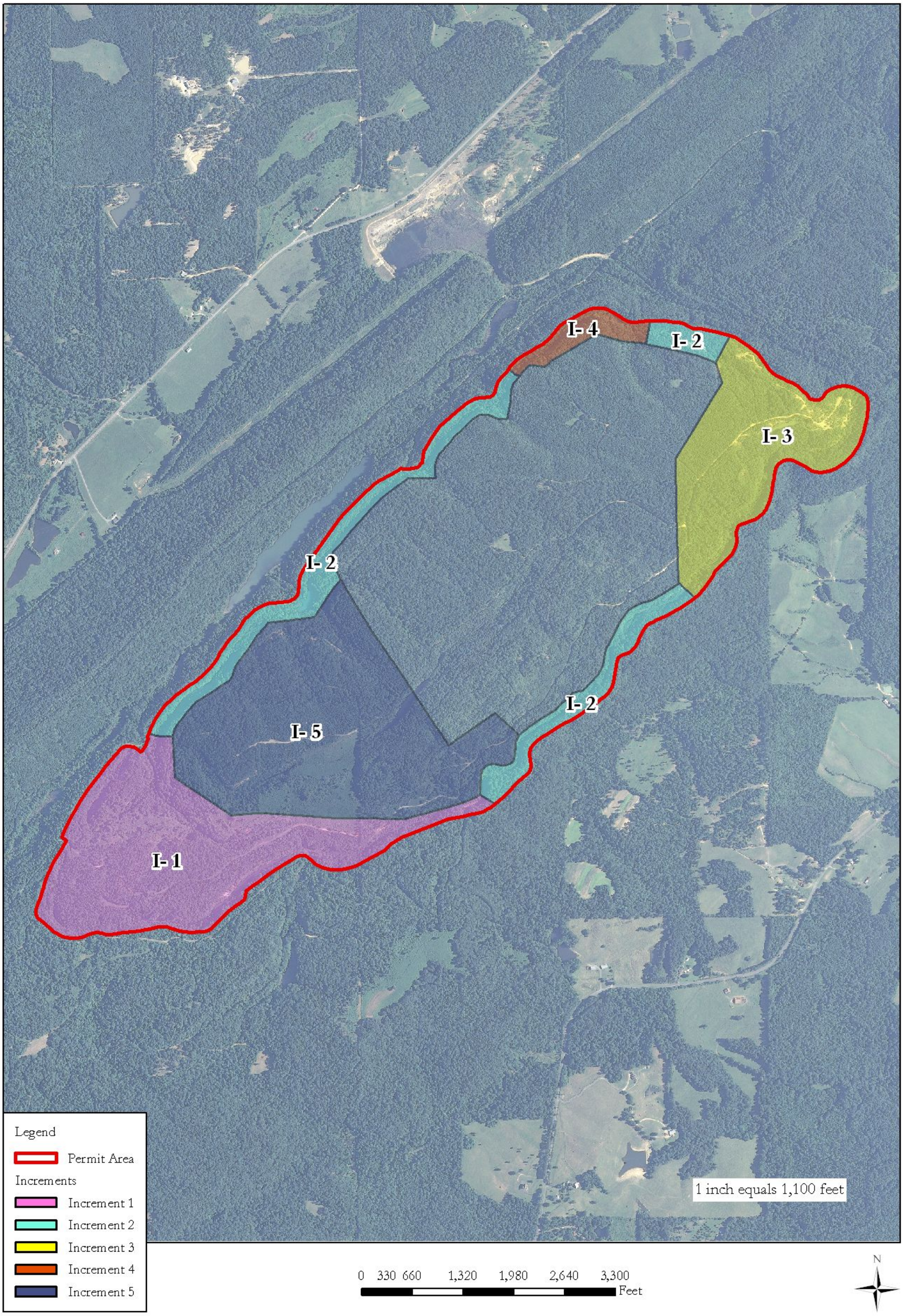


Alabama
Blount County
June 2010

Cedar Lake Mining Company, Inc.
Bull Gap Mine

Increment Map

Altoona DOQ
Hyatt Gap DOQ
S8, 9, 16 - 19 T12S R3E



University of Alabama Museums

Office of Archaeological Research

March 25, 2010

THE UNIVERSITY OF
ALABAMA
MUSEUMS

Mr. Jerry W. Williams
Task Engineering Management, Inc.
2832 Monte Deste Drive
Birmingham, Alabama 35216

OAR PROJECT NUMBER: 10-137

Dear Mr. Williams:

Please find enclosed for your company a copy of our recent report entitled "A Phase I Archaeological Survey of 885 Acres for the Proposed Bull Gap Mine in Blount County, Alabama", by Samuel D. Mizelle, II of our staff. Please note that SHPO has 30 days to comment on our findings.

It has been a pleasure to be of service to Task Engineering Management, Inc. Please feel free to call for further information or services.

Sincerely,

Eugene Futato

Eugene M. Futato/Deputy Director
The University of Alabama
Office of Archaeological Research

EMF:tkw
FILE:2009-10SURVEY.FCL/1

Enclosures: Survey Report
Invoice for Professional Services

13075 Moundville
Archaeological Park
Moundville, Alabama 35474
(205) 371-2266
FAX (205) 371-2494

A Phase I Archaeological Survey of 885 Acres for the Proposed Bull Gap Mine in Blount County, Alabama

Samuel D. Mizelle, II

PERFORMED FOR:
Task Engineering Management, Inc.
2832 Monte Deste Drive
Birmingham, Alabama 35216

PERFORMED BY:
The University of Alabama
Office of Archaeological Research
13075 Moundville Archaeological Park
Moundville, Alabama 35474

MARCH 2010

OFFICE OF ARCHAEOLOGICAL RESEARCH
The University of Alabama
University of Alabama Museums
13075 Mound State Parkway
Moundville, Alabama 35474

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THE UNIVERSITY OF
ALABAMA
MUSEUMS

March 25, 2010

A Phase I Archaeological Survey of 885 Acres for the Proposed Bull Gap Mine in Blount County, Alabama

OAR PROJECT NUMBER: 10-137

PERFORMED FOR: Task Engineering Management, Inc.
2832 Monte Deste Drive
Birmingham, Alabama 35216
Attn: Mr. Jerry W. Williams

PERFORMED BY: Samuel D. Mizelle, II, Cultural Resources Investigator
John F. Lieb, Cultural Resources Assistant
The University of Alabama
Office of Archaeological Research
13075 Moundville Archaeological Park
Moundville, Alabama 35474

DATE PERFORMED: March 1-5, 2010

Samuel D. Mizelle, II
Cultural Resources Investigator
Office of Archaeological Research

Eugene M. Futato/Deputy Director
The University of Alabama
Office of Archaeological Research

13075 Moundville
Archaeological Park
Moundville, Alabama 35474
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A Phase I Archaeological Survey of 885 Acres for the Proposed Bull Gap Mine in Blount County, Alabama

Samuel D. Mizelle, II

Introduction

The University of Alabama, Office of Archaeological Research (OAR) was contracted by Task Engineering, LLC to perform a cultural resources reconnaissance survey of approximately 885 acres for the proposed in Bull Gap Mine project in Blount County, Alabama. Samuel D. Mizelle, II (Cultural Resources Investigator) and John F. Lieb (Cultural Resources Assistant) conducted the survey, and Mr. Mizelle and Eugene M. Futato served as Co-Principal Investigators for the project. The pedestrian survey was conducted during the period of March 1–5, 2010 to locate and identify any archaeological sites or historic standing structures within the survey boundaries, assess their archeological significance, and provide eligibility recommendations based on the guidelines set forth by the National Historic Preservation Act and the Alabama Historical Commission.

Literature and Document Search

The Alabama State Site File (ASSF), housed at OAR, contains no previously recorded sites within the project area. There are four previously recorded sites within a one mile vicinity of the project area (1Bt87, 1Bt106, 1Bt107, and 1Bt108), located on the west side on Straight Mountain (Figure 1) (OAR 2002). Only 1Bt106 has been investigated beyond a reconnaissance level, but was determined not to be eligible for inclusion in the National Register of Historic Places (NRHP). None of the remaining three sites were recommended for additional testing. The National Archaeological Database Bibliography (NADB) lists no previous surveys conducted within the project area. Neither the NRHP nor the Alabama Register of Landmarks and Heritage list any properties within the immediate vicinity of the project area.

Environmental Setting

As seen on the Altoona and Hyatt Gap, Alabama USGS 7.5 minute topographic maps, the study areas are located in Sections 8, 9, 16, 17, 18, and 19 of T12S, R3E (Figure 1). The project area lies within the Blount Mountain district of the Cumberland Plateau physiographic section. This district is a “submaturely dissected synclinal sandstone and shale plateau of moderate relief” (Sapp and Emplaincourt 1975). Topographically, the project has elevations ranging from approximately 1000 to 1240 feet AMSL.

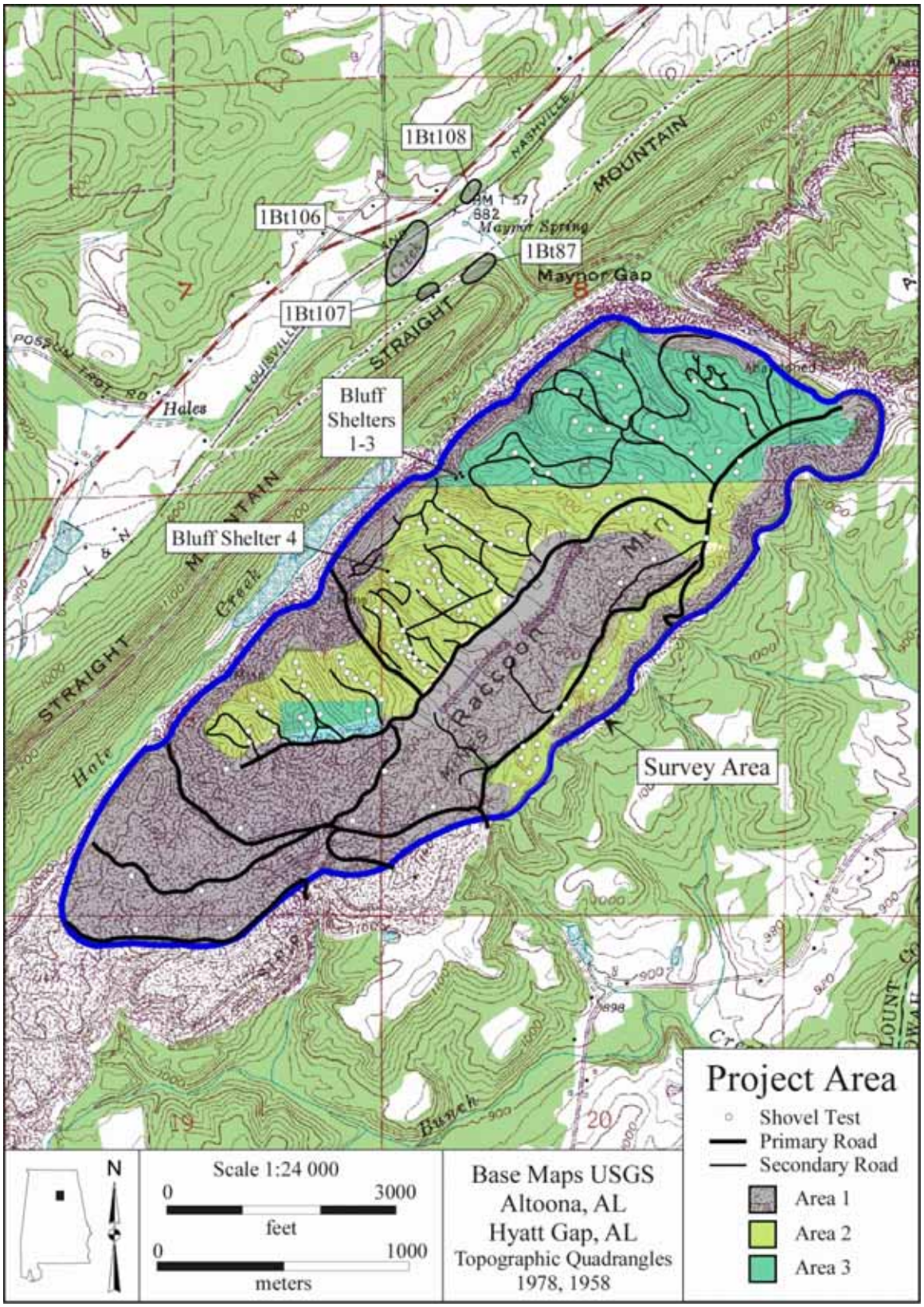

Figure 1. View of project area, shovel tests and roads as seen on Altoona and Hyatt Gap USGS topographic maps.

The National Cooperative Soil Survey for Blount County (NCSS 2007) classifies two soil types within the survey area: Montevallo-Townley complex, 15-45 percent slopes (54.5% of survey area) and Palmerdale very channery silt loam, 2-60 percent slopes (45.5% of survey area) (Figure 2). The Soil Survey of Blount County, Alabama (Bowen et al. 1979) describes the two soil types as follows below:

> *Montevallo-Townley complex*: The soils in this complex are on rough hilly uplands that have narrow winding ridgetops and steep side slopes that are dissected by drainageways and intermittent streams. Because of steep slopes and a very high hazard of erosion, this complex is not suited to cultivated crops; it is better suited to woodland. Most of the acreage is second-growth pine and mixed hardwoods.
>
> *Palmerdale Series*: The Palmerdale series consists of deep, somewhat excessively drained, very shaly soils. These soils formed in spoil material derived from strip mining of coal. They are gently rolling to very steep. Most of the acreage is idle, but a few areas have been planted to pine, and a few small areas have been smoothed and are in pasture. This soil is suited to pine trees.

As evident from the soil associations and map symbology on the USGS topographic map, approximately 485 acres of the project area have been previously mined. The impact of previous mining activities is documented in the field methods portion of this report. This portion of the project lands is referred to as Area 1, and offered virtually no potential for intact cultural deposits. The vegetation in Area 1 consists of approximately 20-30 year old planted pines mixed with some hardwoods and assorted scrub vegetation.

Area 2 is approximately 240 acres, and primarily contains mixed hardwoods (90%) and a few pine trees. While this area presented the best potential for undisturbed archaeological sites, site probability was low to moderate at best. Most of the rather narrow ridges have deeply cut logging and/or mine access roads extending along their spines, and several roads that drop down into the drainages as well. Consistent with the Montevallo-Townley complex soils, the drainages were steeply incised, with slopes ranging from 15-45 percent.

Area 3, though not previously mined, offered little potential for intact cultural deposits. Classified in this report by the vegetative cover, Area 3 is primarily in Section 8 (145 acres), and a small portion of Section 18 (15 acres). These areas are densely populated with small diameter pine trees that are probably less than 10 years old. In addition to recent timbering activities, the area is riddled with old logging roads and access roads to the surrounding mining areas. There is an abundance of pushpiles located in Area 3, further diminishing the probability of undisturbed archaeological sites.

The three areas classified are color coded on Figure 1, but are equally as apparent on the aerial photograph (Figure 3). The pine trees are considerably taller in the previously mined Area 1, and the high wall features from mining can be seen around the entire perimeter of the project area. Also visible are the more barren areas, covered primarily by dense scrub vegetation.

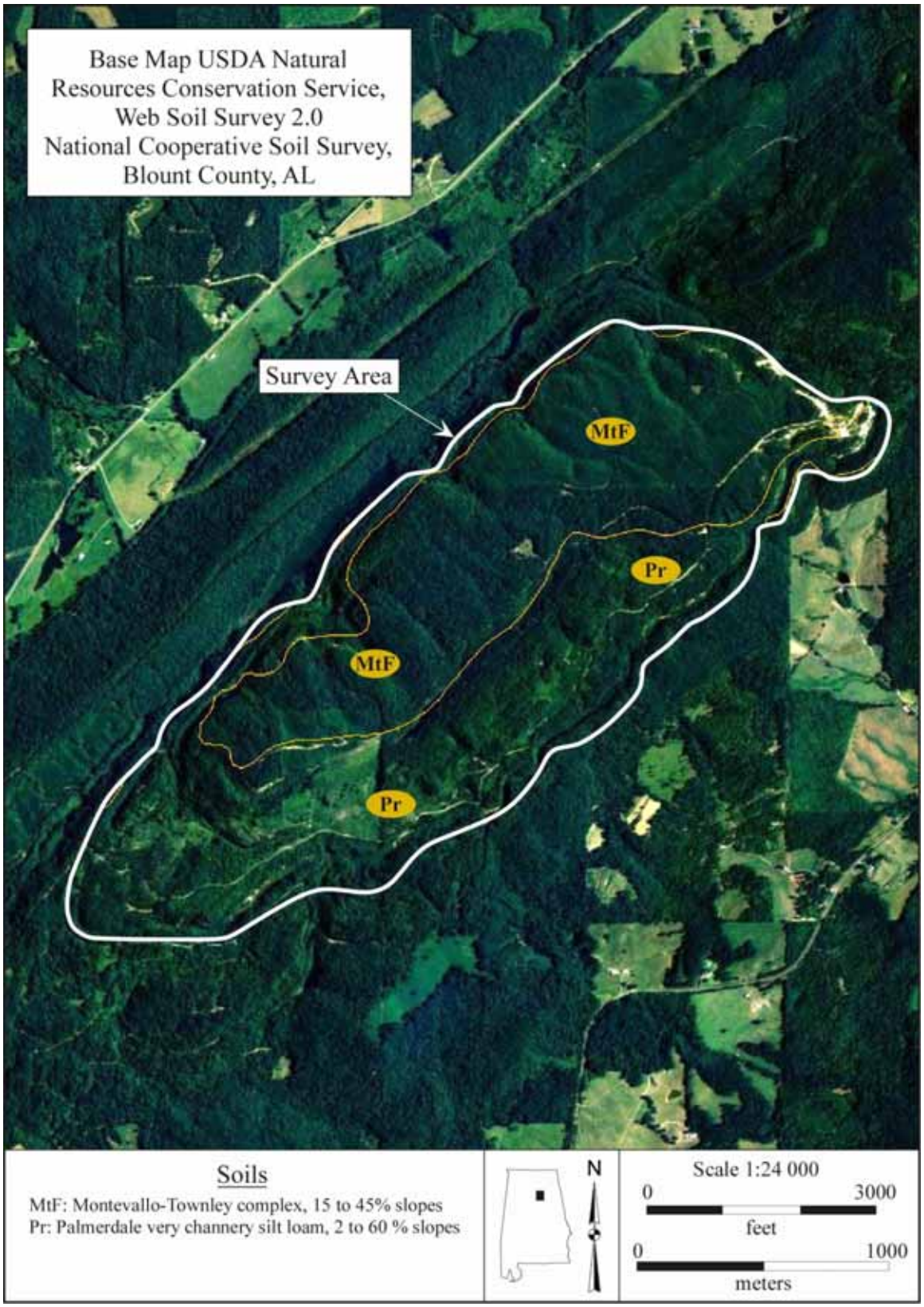

Figure 2. Soil associations within project area.

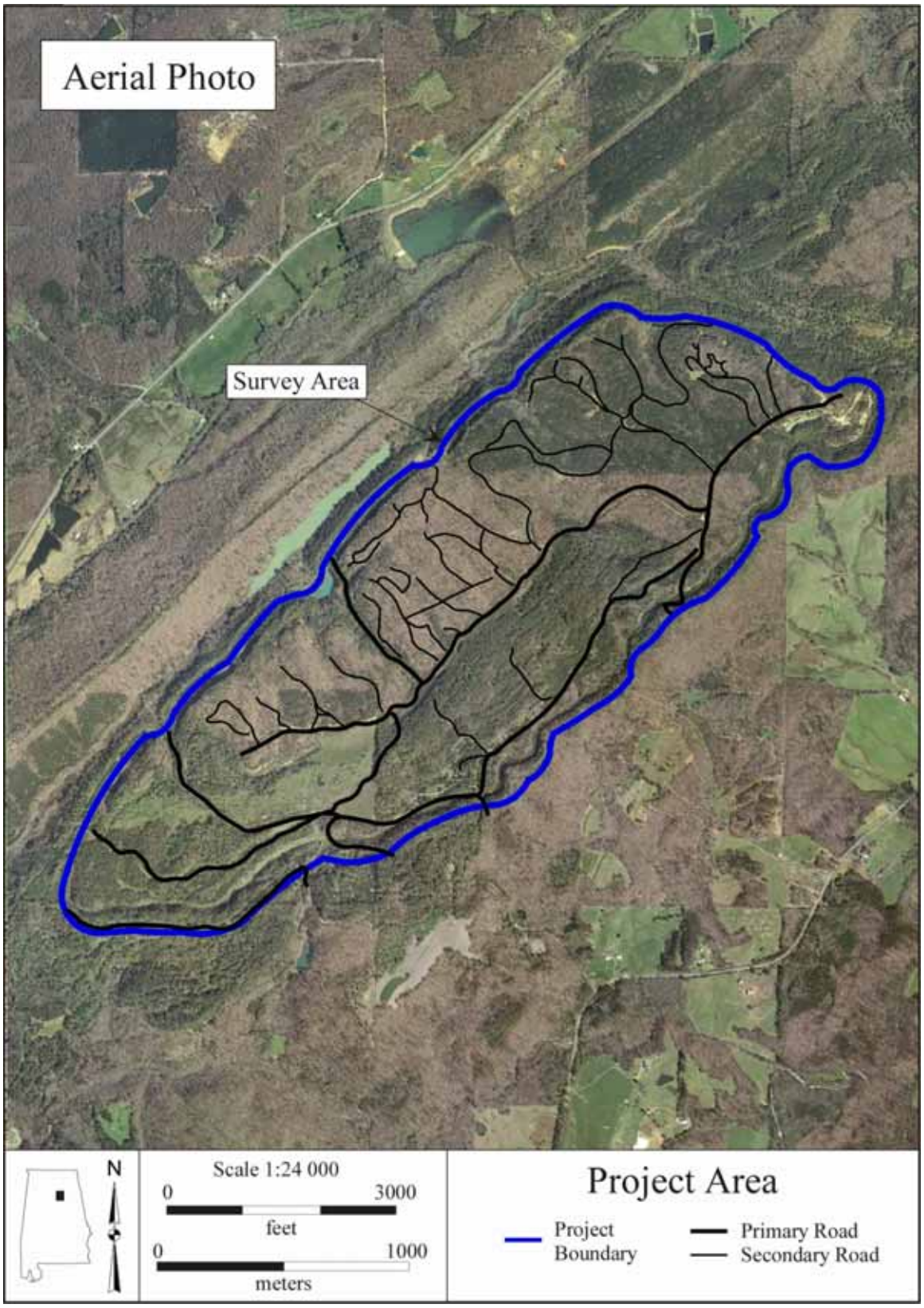

Figure 3. Project area as seen on aerial photograph.

Taken during the winter months, the hardwoods in Area 2 appear as a brownish color on the aerial photograph. Finally, the dense small diameter pine trees of Area 3 are a distinct contrast along the southern boundary of Section 8 and the northeast ¼ of the southeastern ¼ of Section 18.

Field Methods

The field survey implemented standard survey techniques, and followed the guidelines set forth by the Alabama Historical Commission. Field investigations were conducted by a pedestrian reconnaissance using visual inspection of exposed ground surfaces, as well as subsurface testing. All shovel tests measured 30 cm in diameter and were excavated to a depth of at least 30 cm or until sterile subsoil or bedrock was encountered. All excavated soils were screened through 6 mm wire mesh to recover cultural materials. The extensive road networks throughout the project area had moderate to good surface visibility, as did many areas where exposed subsoil was found at the ground surface. The project area was walked over in its entirety, including the steep slopes and drainages to ensure no bluff shelters or historic features were missed. Numerous photographs were taken throughout the project area to document the degree of disturbance, soil profiles, vegetation and topography. The location and direction of the photographs are plotted on Figure 37. A total of 130 shovel tests was excavated, the locations of which can be found on Figure 1. Shovel testing was not conducted on slopes in excess of 15%. The shovel testing intervals were increased in areas that were obviously disturbed by mining and timbering activities.

Limited shovel testing was conducting in the previously mined Area 1, primarily to verify the degree of disturbance. This area was easily identifiable based upon the vegetation (or lack thereof), mining spoil piles and highwalls (Figures 4-13). Visual inspection of the barren ground surface precluded the need for testing in many areas (Figure 14) and a quick flip of the thin ground cover revealed the degree of disturbance across the acreage contained in Area 1 (Figure 15).

Areas 2 and 3 were more thoroughly tested, though the degree of disturbance in Area 3 did not warrant systematic shovel testing at 30 meter intervals. Both of these areas contained road networks that extended down virtually every ridgeline, and Area 3 contained hundreds of pushpiles, most likely attributable to road building, timber clearing and stump removal (Figures 16-18). Portions of Area 3 were void of almost any topsoil, and pine tree growth was stunted from lack of nutrients (Figure 19).

While Area 2 offered the best potential for intact cultural deposits, site probability was still relatively low due to the topography and the lack of a substantial water source nearby. Site probability was further diminished by the deeply cut roads along the ridgelines and even a few on the side slopes leading into the steeply incised drainages (Figures 20-22).

Figure 4. View of previous mining area and reclamation pine trees.

Figure 5. View of previously mined area and scrub vegetation.

Figure 6. View of staging area leading to highwall along northern side of project area.

Figure 7. View of previously mined area.

Figure 8. View of spoil piles in previously mined area.

Figure 9. Spoil pile within Area 1.

Figure 10. Highwall along western perimeter of project area.

Figure 11. Highwall on southwestern perimeter of project area.

Figure 12. View of young pine trees in previously mined area.

Figure 13. View of secondary growth, slope, and rock outcrops in previously mined area.

Figure 14. View of barren ground surface in Area 1.

Figure 15. View of shovel test in Area 1.

Figure 16. Small diameter pine trees in Area 3.

Figure 17. General view of vegetation and pushpiles in Area 3.

Figure 18. View of pushpiles, relic logging road and vegetation in Area 3.

Figure 19. View of planted pines in Area 3.

Figure 20. View of road cut extending west along ridgeline in Area 2.

Figure 21. View of deep road cut and slope in south end of Area 2.

Figure 22. View of ridgeline road and cutback leading into drainage.

Soil profiles even in relatively undisturbed areas were generally lacking a well developed A Horizon (Figures 23 and 24). A typical profile consisted of 2-5 centimeters (cm) of a humic layer, underlain by 20-30 cm of 10YR 7/4 (very pale brown) sandy loam, followed by a 10YR 7/8 (yellow) sandy clay. Percentages of sandstone and shale gravels increased with depth.

Due to the narrow widths of the landforms and the road disturbances, only a few of the ridges required more than one transect to adequately cover testing requirements. A considerable amount of ground disturbance has occurred along the primary road that winds through Area 2 (Figure 25). In addition, several of the broader landforms that appear more promising on the topographic map are occupied by game plots (Figures 3 and 26). Game plots were examined for cultural materials using a combination of surface inspection and shovel testing.

As viewed on the topographic map and as described in the Montevallo-Townley complex soil association, Areas 2 and 3 are characterized by steep drainages (15-45% slopes) between the ridgelines (Figures 27 and 28). All drainages were inspected via pedestrian walkover for bluff shelters and historic features. Four bluff shelters were identified by walking the steep side slopes. Three of these were too small (less than one meter tall or deep) to have had much utility, and had no accumulation of topsoil atop the parent rock material (Figures 29-31). All three of these are in close proximity to one another on a south facing slope, overlooking a very steep drainage. They are located near the western boundary of the project area along the southern line of Section 8.

Figure 23. View of shovel test.

Figure 24. View of shovel test.

Figure 25. View of ground disturbance in Area 2.

Figure 26. View of game plot in Area 2.

Figure 27. View of steep side slope in Area 2.

Figure 28. View of steeply incised drainage in Area 2.

Figure 29. View of Bluff Shelter 1.

Figure 30. View of Bluff Shelter 2.

Figure 31. View of Bluff Shelter 3.

The fourth bluff shelter is also located on a south facing slope. It is slightly larger than the other three, though not big enough for anything more than a very temporary shelter (Figure 32). Unfortunately, this bluff shelter has been looted. It has relatively good access from a road that extends along the ridgeline above, and is only 15-20 meters down the hillside. The looter hole is an irregular shape, as it has been excavated down to the underlying rock materials, with virtually all soils removed (Figure 33). A profile and plan view sketch can be seen in Figure 34. The shelter was full of leaves, but careful probing with a shovel and trowel confirmed that the entire interior had been picked over. Due to the steep drop off below the shelter, only one shovel test was possible at this location, placed along the drip line just east of the looter's hole. One piece of Bangor chert debitage (0.25 inch with a small amount of cortex) was found at approximately 10 cm below surface (cmbs). The shovel test was terminated at 27 cmbs, where solid rock was encountered. Attempts were made to expand the perimeter of the shovel test outward, but rock impediments prevented expansion of the test much beyond its original size. The limited testing potential (due to the slope and protruding rock outcrops along the hillside) is visible in the figures associated with this bluff shelter.

A makeshift screen was found a few meters down the steep hillside (Figure 35). It had been propped up against a tree to provide a surface to screen the excavated soils through. The screened dirt pile was examined for any debitage or other small artifacts that might have been missed or discarded, but yielded no cultural materials (Figure 36). The back dirt pile was rather small and had relatively high gravel content. This, combined with several surrounding loose stones between the shelter and the back dirt pile, suggests only a moderate amount of soil was

Figure 32. View of Bluff Shelter 4.

Figure 33. View of interior of Bluff Shelter 4 with shovel in looter's hole.

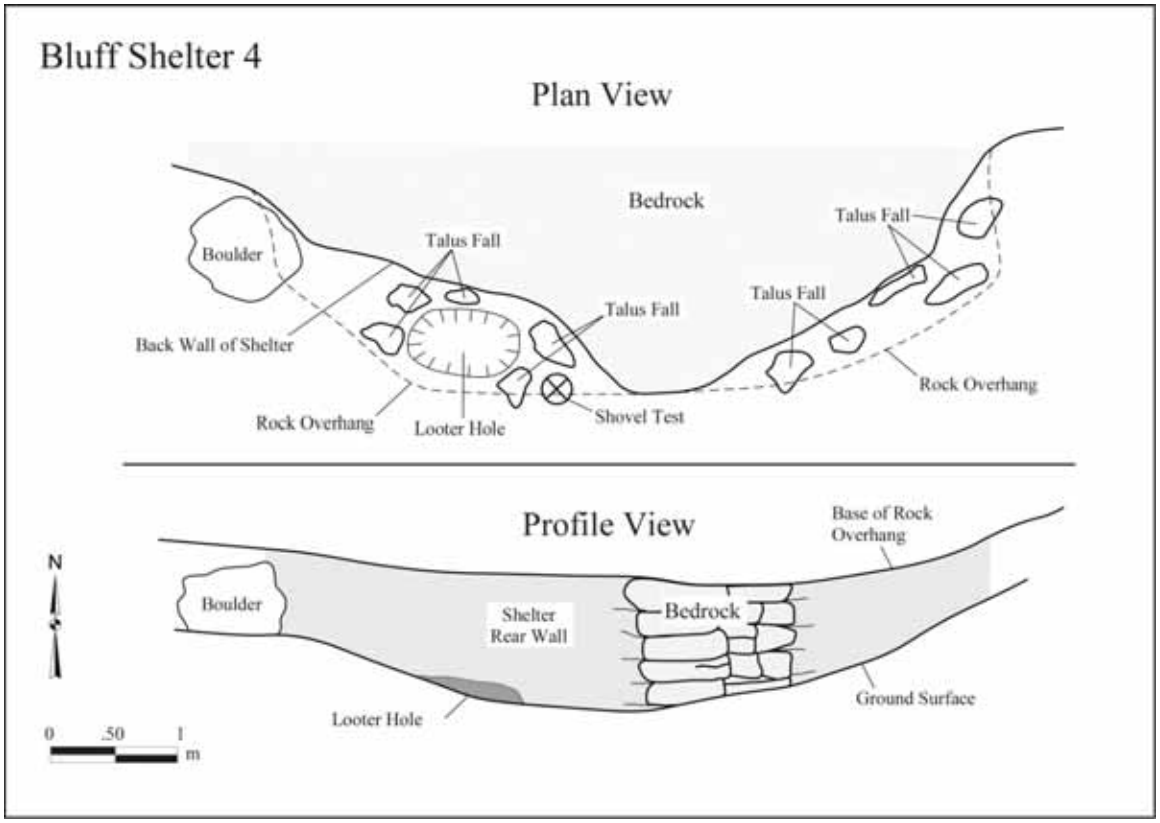

Figure 34. Profile and plan view of Bluff Shelter 4.

Figure 35. View of looter's screen, slope and rock outcrops below Bluff Shelter 4.

Figure 36. View of inspection of looter's spoil pile for artifacts.

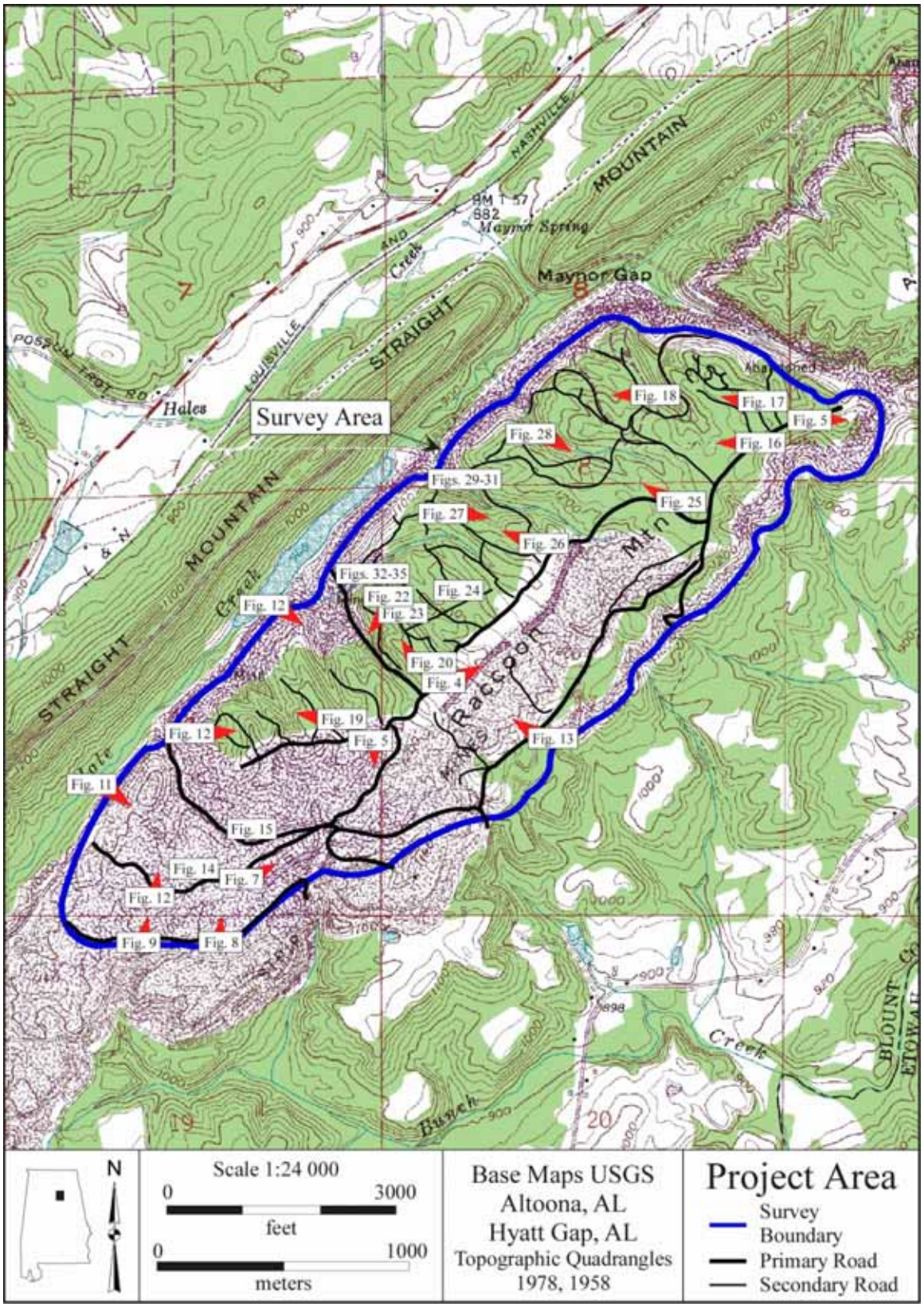

Figure 37. Map of photograph locations and direction included in report.

within the bluff shelter to before it was looted. Since only one piece of debitage was found at this location, it was recorded as an isolated find. Due to the lack of intact deposits within the shelter, combined with the steep slope and minimal topsoil on the hillside, no additional testing appears warranted or feasible.

Laboratory Methods and Collection Curation

All artifacts, photographs, field notes, maps, and documentation pertinent to the survey will be curated at the Erskine Ramsay Archaeological Repository located at Moundville Archaeological Park. This repository meets Department of the Interior curation standards as defined under 36 CFR Part 79.

Results and Recommendations

During the course of the survey, no prehistoric or historic archaeological sites were identified. Previous mining, clearcutting, and other timbering activities have heavily disturbed a large portion of the project area. The rugged terrain of even the less disturbed areas and the lack of a perennial water source offered limited potential for significant resources to be located within the project lands. Essentially, no A horizon was present in any of the 130 shovel tests performed. One piece of chert debitage was the sole artifact recovered from the project lands, found in Area 2 in the vicinity of a small bluff shelter. This shelter had been previously looted, and likely would not have yielded a significant amount of cultural materials due to its size and lack of deeply deposited soils. Therefore, based on the absence of any significant cultural materials or historic standing structures within the vicinity, this office recommends a finding of no properties.

References Cited

Bowen, Charles D., Bobby C. Fox, David E. Lewis, E. H. McBride, and H.C. Buckelew
1979 *Soil Survey of Blount County, Alabama*. United States Department of Agriculture, Washington.

Sapp, C. Daniel, and Jacques Emplaincourt
1975 *Physiographic Regions of Alabama*. Map 168. Geological Survey of Alabama, University.

Internet References

Office of Archaeological Research, University of Alabama Museums (OAR)
2002 Alabama State Site File. Secure electronic document, accessed March 5, 2010.

National Cooperative Soil Survey (NCSS)
2007 United States Department of Agriculture, Resources Conservation Services, Web Soil Survey 2.0, National Cooperative Soil Survey, St. Clair County, Alabama. Accessed March 8, 2010.

ATTACHMENT

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): November 2009 – May 2010

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD: *TASK Engineering Management, Inc. for Cedar Lake Mining, Inc. P.O. Box 660548 Birmingham, Alabama 35266*

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: *Birmingham, Alabama* Field Office

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION: Blount County, Alabama – see maps in document

(USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)

State: *Alabama* County/parish/borough: *Blount County* City: *Altoona, Al.*

Center coordinates of site (lat/long in degree decimal format):
Lat. N33 59 36.8", Long. W86 21 36.0".

Universal Transverse Mercator:

Name of nearest water body: *Hale Creek*

Identify (estimate) amount of waters in the review area: *See Attached sheet for waters in the project area*

Non-wetland waters: linear feet: width (ft) and/or acres.
Cowardin Class:
Stream Flow:
Wetlands: acres. 1.9
Cowardin Class:

Name of any water bodies on the site that have been identified as Section 10 waters: *Section 10 waters are not located in the project area.*
Tidal: Na
Non-Tidal: Na

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date:

☒ Field Determination. Date(s): 11/1/2009 – 5/15/2010

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: *Delta Natural Resource Service, Inc.*

☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant. *Delta Natural Resource Services Inc.*

☐ Office concurs with data sheets/delineation report.

☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps: .

☐ Corps navigable waters' study: .

☐ U.S. Geological Survey Hydrologic Atlas: .

☐ USGS NHD data.

☐ USGS 8 and 12 digit HUC maps.

☒ U.S. Geological Survey map(s). Cite scale & quad name: 1:660 Altoona & Hyatt Gap DOQ

☒ USDA Natural Resources Conservation Service Soil Survey. Citation: Blount County Soil Survey USDA/NRCS

☐ National wetlands inventory map(s). Cite name: .

☐ State/Local wetland inventory map(s): .

☐ FEMA/FIRM maps: .

☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

☒ Photographs: ☒ Aerial (Name & Date): 11/1/2009 – 5/15/2010

or ☐ Other (Name & Date): .

☐ Previous determination(s). File no. and date of response letter: .

☐ Other information (please specify): .

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

_____	_____
Signature and date of Regulatory Project Manager (REQUIRED)	Signature and date of person requesting preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

Site Number	Longitude	Latitude	Stream category	Estimated amount of aquatic resource in review area	Stream & bed Characteristics
10A	W86 21.3225	N33 59.94123	Intermittent	260	Rocky bed, loamy & clayey banks
11A	W86 21.20705	N33 59.74207	Intermittent	640	Rocky bed, loamy & clayey banks
17	W86 21.58347	N33 59.60672	Intermittent	620	Rocky bed, loamy & clayey banks
20	W86 21.96628	N33 59.20787	Intermittent	1260	Rocky bed, loamy & clayey banks
16	W86 21.4474	N33 59.47982	ephemeral	1040	Rocky bed, loamy & clayey banks
21	W86 21.69232	N33 59.20273	ephemeral	580	Rocky bed, loamy & clayey banks
Wetland areas 1,2, 3,4,5 & 6 = 1.9 acres			See WRAP data sheets and wetland descriptions in mitigation document		

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): WFP 1

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Mobile Distric-Birmingham Field Office District;

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State:AL County/parish/borough: Blount City: Altoona area
Center coordinates of site (lat/long in degree decimal format): Lat. 34 00.11752° **N**, Long. 86 20.44665° **W**.
Universal Transverse Mercator:
Name of nearest waterbody: Locust Fork
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Locust Fork
Name of watershed or Hydrologic Unit Code (HUC): 316011

- ☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- ☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- ☐ Office (Desk) Determination. Date:
- ☒ Field Determination. Date(s): Novrmber 1, 2009 - May 15, 2010

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Pick List** *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

- ☐ Waters subject to the ebb and flow of the tide.
- ☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain: Navigable water as listed in Nashville District Public Notice #86-23, dated 8 May 1986.

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Pick List** *"waters of the U.S."* within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
   - ☐ TNWs, including territorial seas
   - ☐ Wetlands adjacent to TNWs
   - ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
   - ☐ Non-RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
   - ☐ Impoundments of jurisdictional waters
   - ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
   Non-wetland waters: linear feet: width (ft) and/or acres.
   Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: **Pick List**
   Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   - ☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: **WFP #1 was evaluated and the drainage water flows off a mined area high wall and is container in porous mine spoil and non connecting drainage collection pools**.

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW: .

Summarize rationale supporting determination: Navigable water as listed in Nashville District Public Notice #86-23, dated 8 May 1986
.

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: **acres**
Drainage area: **acres**
Average annual rainfall: inches
Average annual snowfall: inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☐ Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Project waters are **Pick List** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: .

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Identify flow route to TNW[5]: .
Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):
Tributary is: ☐ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):
☐ Silts ☐ Sands ☐ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):
☐ clear, natural line impressed on the bank
☐ changes in the character of soil
☐ shelving
☐ vegetation matted down, bent, or absent
☐ leaf litter disturbed or washed away
☐ sediment deposition
☐ water staining
☐ other (list):
☐ the presence of litter and debris
☐ destruction of terrestrial vegetation
☐ the presence of wrack line
☐ sediment sorting
☐ scour
☐ multiple observed or predicted flow events
☐ abrupt change in plant community
☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by:
☐ oil or scum line along shore objects
☐ fine shell or debris deposits (foreshore)
☐ physical markings/characteristics
☐ tidal gauges
☐ other (list):
☐ Mean High Water Mark indicated by:
☐ survey to available datum;
☐ physical markings;
☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.
[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☐ Riparian corridor. Characteristics (type, average width): .
☐ Wetland fringe. Characteristics: .
☐ Habitat for:
  ☐ Federally Listed species. Explain findings: .
  ☐ Fish/spawn areas. Explain findings: .
  ☐ Other environmentally-sensitive species. Explain findings: .
  ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
  Wetland size: acres
  Wetland type. Explain: .
  Wetland quality. Explain: .
Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:
Flow is: **Pick List**. Explain: .

Surface flow is**: Pick List**
  Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
  ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:
☐ Directly abutting
☐ Not directly abutting
  ☐ Discrete wetland hydrologic connection. Explain: .
  ☐ Ecological connection. Explain: .
  ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW
Project wetlands are **Pick List** river miles from TNW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Flow is from: **Pick List.**
Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .
Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width): .
☐ Vegetation type/percent cover. Explain: .
☐ Habitat for:
  ☐ Federally Listed species. Explain findings: .
  ☐ Fish/spawn areas. Explain findings: .
  ☐ Other environmentally-sensitive species. Explain findings: .
  ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **Pick List**
Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   ☐ TNWs: linear feet width (ft), Or, acres.
   ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Large Watershed associated with the reach. Well Defined Bed and Banks.
   ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: **.**

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: **.**

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

---

[8] See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☐ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study:Navigable water as listed in Nashville District Public Notice #86-23, dated 8 May 1986.
☐ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☐ U.S. Geological Survey map(s). Cite scale & quad name: Sequatchie 1:24000 .
☐ USDA Natural Resources Conservation Service Soil Survey. Citation: .
☐ National wetlands inventory map(s). Cite name: .
☐ State/Local wetland inventory map(s): .
☐ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☐ Photographs: ☐ Aerial (Name & Date): .
or ☐ Other (Name & Date): .
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): WFP 2

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Mobile Distric-Birmingham Field Office District;

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State:AL County/parish/borough: Blount City: Altoona area
Center coordinates of site (lat/long in degree decimal format): Lat. 34 00.1486° **N**, Long. 86 20.53218° **W**.
Universal Transverse Mercator:
Name of nearest waterbody: Locust Fork
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Locust Fork
Name of watershed or Hydrologic Unit Code (HUC): 316011

- ☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- ☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- ☐ Office (Desk) Determination. Date:
- ☒ Field Determination. Date(s): Novrmber 1, 2009 - May 15, 2010

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Pick List** *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

- ☐ Waters subject to the ebb and flow of the tide.
- ☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain: Navigable water as listed in Nashville District Public Notice #86-23, dated 8 May 1986.

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Pick List** *"waters of the U.S."* within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
   - ☐ TNWs, including territorial seas
   - ☐ Wetlands adjacent to TNWs
   - ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
   - ☐ Non-RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
   - ☐ Impoundments of jurisdictional waters
   - ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
   Non-wetland waters: linear feet: width (ft) and/or acres.
   Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: **Pick List**
   Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   - ☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: **WFP #1 was evaluated and the drainage water flows off a mined area high wall and is container in porous mine spoil and non connecting drainage collection pools**.

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW: .

Summarize rationale supporting determination: Navigable water as listed in Nashville District Public Notice #86-23, dated 8 May 1986
.

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: **acres**
Drainage area: **acres**
Average annual rainfall: inches
Average annual snowfall: inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☐ Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Project waters are **Pick List** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: .

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Identify flow route to TNW[5]: .
Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):
Tributary is: ☐ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):
☐ Silts ☐ Sands ☐ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):
☐ clear, natural line impressed on the bank
☐ changes in the character of soil
☐ shelving
☐ vegetation matted down, bent, or absent
☐ leaf litter disturbed or washed away
☐ sediment deposition
☐ water staining
☐ other (list):
☐ the presence of litter and debris
☐ destruction of terrestrial vegetation
☐ the presence of wrack line
☐ sediment sorting
☐ scour
☐ multiple observed or predicted flow events
☐ abrupt change in plant community
☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by:
☐ oil or scum line along shore objects
☐ fine shell or debris deposits (foreshore)
☐ physical markings/characteristics
☐ tidal gauges
☐ other (list):
☐ Mean High Water Mark indicated by:
☐ survey to available datum;
☐ physical markings;
☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.
[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☐ Riparian corridor. Characteristics (type, average width): .
☐ Wetland fringe. Characteristics: .
☐ Habitat for:
  ☐ Federally Listed species. Explain findings: .
  ☐ Fish/spawn areas. Explain findings: .
  ☐ Other environmentally-sensitive species. Explain findings: .
  ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
  Wetland size: acres
  Wetland type. Explain: .
  Wetland quality. Explain: .
Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:
Flow is: **Pick List**. Explain: .

Surface flow is**: Pick List**
  Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
  ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:
☐ Directly abutting
☐ Not directly abutting
  ☐ Discrete wetland hydrologic connection. Explain: .
  ☐ Ecological connection. Explain: .
  ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW
Project wetlands are **Pick List** river miles from TNW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Flow is from: **Pick List.**
Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .
Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width): .
☐ Vegetation type/percent cover. Explain: .
☐ Habitat for:
  ☐ Federally Listed species. Explain findings: .
  ☐ Fish/spawn areas. Explain findings: .
  ☐ Other environmentally-sensitive species. Explain findings: .
  ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **Pick List**
Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   ☐ TNWs: linear feet width (ft), Or, acres.
   ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Large Watershed associated with the reach. Well Defined Bed and Banks.
   ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: **.**

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: **.**

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

---

[8] See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☐ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study:Navigable water as listed in Nashville District Public Notice #86-23, dated 8 May 1986.
☐ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☐ U.S. Geological Survey map(s). Cite scale & quad name: Sequatchie 1:24000 .
☐ USDA Natural Resources Conservation Service Soil Survey. Citation: .
☐ National wetlands inventory map(s). Cite name: .
☐ State/Local wetland inventory map(s): .
☐ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☐ Photographs: ☐ Aerial (Name & Date): .
or ☐ Other (Name & Date): .
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): WFP 18

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Mobile Distric-Birmingham Field Office District;

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State:AL County/parish/borough: Blount City: Altoona area
Center coordinates of site (lat/long in degree decimal format): Lat. 33 59.45853° **N**, Long. 86 21.63693° **W**.
Universal Transverse Mercator:
Name of nearest waterbody: Locust Fork
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Locust Fork
Name of watershed or Hydrologic Unit Code (HUC): 316011

- ☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- ☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- ☐ Office (Desk) Determination. Date:
- ☒ Field Determination. Date(s): Novrmber 1, 2009 - May 15, 2010

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Pick List** *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

- ☐ Waters subject to the ebb and flow of the tide.
- ☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain: Navigable water as listed in Nashville District Public Notice #86-23, dated 8 May 1986.

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Pick List** *"waters of the U.S."* within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
   - ☐ TNWs, including territorial seas
   - ☐ Wetlands adjacent to TNWs
   - ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
   - ☐ Non-RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
   - ☐ Impoundments of jurisdictional waters
   - ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
   Non-wetland waters: linear feet: width (ft) and/or acres.
   Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: **Pick List**
   Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   - ☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: **WFP #1 was evaluated and the drainage water flows off a mined area high wall and is container in porous mine spoil and non connecting drainage collection pools**.

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW: .

Summarize rationale supporting determination: Navigable water as listed in Nashville District Public Notice #86-23, dated 8 May 1986
.

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: **acres**
Drainage area: **acres**
Average annual rainfall: inches
Average annual snowfall: inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☐ Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Project waters are **Pick List** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: .

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Identify flow route to TNW[5]: .
Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):
Tributary is: ☐ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):
☐ Silts ☐ Sands ☐ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):
☐ clear, natural line impressed on the bank
☐ changes in the character of soil
☐ shelving
☐ vegetation matted down, bent, or absent
☐ leaf litter disturbed or washed away
☐ sediment deposition
☐ water staining
☐ other (list):
☐ the presence of litter and debris
☐ destruction of terrestrial vegetation
☐ the presence of wrack line
☐ sediment sorting
☐ scour
☐ multiple observed or predicted flow events
☐ abrupt change in plant community
☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by:
☐ oil or scum line along shore objects
☐ fine shell or debris deposits (foreshore)
☐ physical markings/characteristics
☐ tidal gauges
☐ other (list):
☐ Mean High Water Mark indicated by:
☐ survey to available datum;
☐ physical markings;
☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.
[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☐ Riparian corridor. Characteristics (type, average width): .
☐ Wetland fringe. Characteristics: .
☐ Habitat for:
  ☐ Federally Listed species. Explain findings: .
  ☐ Fish/spawn areas. Explain findings: .
  ☐ Other environmentally-sensitive species. Explain findings: .
  ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
  Wetland size: acres
  Wetland type. Explain: .
  Wetland quality. Explain: .
Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:
Flow is: **Pick List**. Explain: .

Surface flow is**: Pick List**
  Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
  ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:
☐ Directly abutting
☐ Not directly abutting
  ☐ Discrete wetland hydrologic connection. Explain: .
  ☐ Ecological connection. Explain: .
  ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW
Project wetlands are **Pick List** river miles from TNW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Flow is from: **Pick List.**
Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .
Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width): .
☐ Vegetation type/percent cover. Explain: .
☐ Habitat for:
  ☐ Federally Listed species. Explain findings: .
  ☐ Fish/spawn areas. Explain findings: .
  ☐ Other environmentally-sensitive species. Explain findings: .
  ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **Pick List**
Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   ☐ TNWs: linear feet width (ft), Or, acres.
   ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Large Watershed associated with the reach. Well Defined Bed and Banks.
   ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: **.**

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: **.**

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

---

[8] See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☐ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study:Navigable water as listed in Nashville District Public Notice #86-23, dated 8 May 1986.
☐ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☐ U.S. Geological Survey map(s). Cite scale & quad name: Sequatchie 1:24000 .
☐ USDA Natural Resources Conservation Service Soil Survey. Citation: .
☐ National wetlands inventory map(s). Cite name: .
☐ State/Local wetland inventory map(s): .
☐ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☐ Photographs: ☐ Aerial (Name & Date): .
or ☐ Other (Name & Date): .
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

Cedar Lake Mining, Inc.
Bull Gap Mine

Date of photograph – May 2010
Location of photograph – above high wall along WFP 7
Way point # 540
Description of photograph – typical view of mined through stream segments above high wall – (WFP 1, WFP 2, WFP 7, WFP 18, & WFP 19) the original channels have been removed and most of the drainage water filter through the porous mine spoil and flow down the high wall.

Cedar Lake Mining, Inc.
Bull Gap Mine

Date of photograph – May 2010
Location of photograph – WFP 10A lower reach
Way point # 504
Description of photograph - the lower reach of WFP 10A indicating a mined through drainage course. The stream course is connected to drainage segments further up in the watershed.

Cedar Lake Mining, Inc.
Bull Gap Mine

Date of photograph – May 2010
Location of photograph WFP 11A –lower reach
Way point # 499
Description of photograph – the lower reach of WFP 11A indicating a mined through drainage course. The stream course is connected to drainage segments further up in the watershed.

Cedar Lake Mining, Inc.
Bull Gap Mine

Date of photograph – May 2010
Locations of photograph – WFP 17 lower reach
Way point # 500
Description of photograph - the lower reach of WFP 17 indicating a mined through drainage course. The stream course is connected to drainage segments further up in the watershed.

Cedar Lake Mining, Inc.
Bull Gap Mine

Date of photograph – May 2010
Location of photograph – lower reach of WFP 20
Way point # 524
Description of photograph - the lower reach of WFP 20 indicating a mined through drainage course. The stream course is connected to drainage segments further up in the watershed.

Cedar Lake Mining, Inc.
Bull Gap Mine

Date of photograph – May 2010
Location of photograph – WFP 21 lower reach
Way point # 531
Description of photograph - the lower reach of WFP 21 indicating a mined through drainage course. The stream course is connected to drainage segments further up in the watershed.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Bull Gap Mine - Blount County, Alabama Applicant/Owner: Cedar Lake Mining, Inc. Investigator: Cleo Stubbs	Date: 11/15/2009 County: Blount State: Alabama
Do Normal Circumstances exist on the site? No Is the site significantly disturbed (Atypical Situation)? Yes Is the area a potential Problem Area? Yes (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: OP-1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. _____	_____	Pick One	9. _____	_____	Pick One
2. _____	_____	Pick One	10. _____	_____	Pick One
3. _____	_____	Pick One	11. _____	_____	Pick One
4. _____	_____	Pick One	12. _____	_____	Pick One
5. _____	_____	Pick One	13. _____	_____	Pick One
6. _____	_____	Pick One	14. _____	_____	Pick One
7. _____	_____	Pick One	15. _____	_____	Pick One
8. _____	_____	Pick One	16. _____	_____	Pick One

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): _____

Remarks: This observation point is located in the vicinity of a stream. The area has been significantly impacted/disturbed by previous mining operations in the area. The vegetation is mixed hardwood and pine growing in mine spoil. SEE DATA SHEET 3

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: >30 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: The hydrology has been altered and the water in the stream is basically flowing in a created channel across and through othe mine spoil debris. The observation area does not have wetland hydrology.SEE DATA SHEET 3

SOILS

Map Unit Name
(Series and Phase): _____

Drainage Class: WD
Field Observations
Confirm Mapped Type? No

Taxonomy (Subgroup): Typic Udorthents

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Contrast	Texture, Concretions, Structure, etc.
0 - 5	A	10 YR 4/4	_____	_____	L
5 - 15	C1	7.5YR 5/6	_____	_____	L
15 - 24	C2	10YR 5/6	10YR 7/4	f2d	sicl
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: SEE DATA SHEET 3

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? No

Is this Sampling Point Within a Wetland? No

Remarks: SEE DATA SHEET 3

DATA FORM 3
ATYPICAL SITUATIONS

Applicant Name: Cedar Lake Mining, Inc.
Location: Blount County, Alabama
Plot # # 1
Application Number:
Date: 16-Nov-09
Project Name: Bull Gap Mine

A VEGETATION:

1. Type of Alteration: This site is located in previously mine area and current landscape is mainly mine spoil. The area was mined during a period know as " Pre-Law"

2. Effect on Vegetation : The original vegetation was completely removed for the mining process several years ago.

3. Previous Vegetation; Ref. sites indicate: Liquidambar styraciflua- T- FAC, Liriodendron tulipifera -T-FAC, Quercus falcata - FACU Quercus falcata-T-FACU,Pinus echinata-T-FAC, Acer rubrum -T-FAC,Smilax glauca-V-FAC

4. Hydrophytic Vegetation? Yes √ No

B SOILS:

1. Type of Alteration; A surface area mining operation has occurred at this observation point.

2. Effect on Soils: The soil area and soil horizons were completely removed during the previous mining operation.

3. Previous Soils: (Attach Documentation) Soil survey indicates area is Townley Soil or an inclusion of the State Soil Series.

4. Hydric Soils? Yes . . No √

C. HYDROLOGY:

1. Type of Alteration: Stream channel is covered and or removed for mining of coal on-site

2. Effect on Hydrology: Hydrology is altered, channel removed, cut and fill activities for the coal mining process.

3. Previous Hydrology: (Attach documentation) Stream channel was ephemeral

4. Wetland Hydrology? Yes NO √

Characterized By: Cleo Stubbs

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Bull Gap Mine - Blount County, Alabama Applicant/Owner: Cedar Lake Mining , Inc. Investigator: Cleo Stubbs	Date: 11/15/2009 County: Blount State: Alabama
Do Normal Circumstances exist on the site? No Is the site significantly disturbed (Atypical Situation)? Yes Is the area a potential Problem Area? Yes (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: OP-2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. _____	_____	Pick One	9. _____	_____	Pick One
2. _____	_____	Pick One	10. _____	_____	Pick One
3. _____	_____	Pick One	11. _____	_____	Pick One
4. _____	_____	Pick One	12. _____	_____	Pick One
5. _____	_____	Pick One	13. _____	_____	Pick One
6. _____	_____	Pick One	14. _____	_____	Pick One
7. _____	_____	Pick One	15. _____	_____	Pick One
8. _____	_____	Pick One	16. _____	_____	Pick One

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): _____

Remarks: This observation point is located in the vicinity of a stream. The area has been significantly impacted/disturbed by previous mining operations in the area. The vegetation is mixed hardwood and pine growing in mine spoil. SEE DATA SHEET 3

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: >30 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: The hydrology has been altered and the water in the stream is basically flowing in a created channel across and through othe mine spoil debris. The observation area does not have wetland hydrology.SEE DATA SHEET 3

SOILS

Map Unit Name
(Series and Phase): _____

Drainage Class: WD
Field Observations
Confirm Mapped Type? No

Taxonomy (Subgroup): Typic Udorthents

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Contrast	Texture, Concretions, Structure, etc.
0 - 7	A	10 YR 4/3	_____	_____	L
7 - 18	C1	10YR 5/6	10YR 4/3	f1d	L
18 - 25	C2	10YR 5/6	10YR 7/4,4/2	f2d	sicl
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: SEE DATA SHEET 3 - Observation point is located in mine spoil area with some temporary ponding near by.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? No

Is this Sampling Point Within a Wetland? No

Remarks: SEE DATA SHEET 3

DATA FORM 3
ATYPICAL SITUATIONS

Applicant Name: Cedar Lake Mining, Inc.
Location: Blount County, Alabama
Plot # # 2
Application Number:
Date: 16-Nov-09
Project Name: Bull Gap Mine

A VEGETATION:

1. Type of Alteration: This site is located in previously mine area and current landscape is mainly mine spoil. The area was mined during a period know as " Pre-Law"

2. Effect on Vegetation : The original vegetation was completely removed for the mining process several years ago.

3. Previous Vegetation; Ref. sites indicate: Liquidambar styraciflua- T- FAC, Liriodendron tulipifera -T-FAC, Quercus falcata - FACU Quercus falcata-T-FACU,Pinus echinata-T-FAC, Acer rubrum -T-FAC,Smilax glauca-V-FAC

4. Hydrophytic Vegetation? Yes √ No

B SOILS:

1. Type of Alteration; A surface area mining operation has occurred at this observation point.

2. Effect on Soils: The soil area and soil horizons were completely removed during the previous mining operation.

3. Previous Soils: (Attach Documentation) Soil survey indicates area is Townley Soil or an inclusion of the State Soil Series.

4. Hydric Soils? Yes . . No √

C. HYDROLOGY:

1. Type of Alteration: Stream channel is covered and or removed for mining of coal on-site

2. Effect on Hydrology: Hydrology is altered, channel removed, cut and fill activities for the coal mining process.

3. Previous Hydrology: (Attach documentation) Stream channel was ephemeral

4. Wetland Hydrology? Yes NO √

Characterized By: Cleo Stubbs

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Bull Gap Mine - Blount County, Alabama Applicant/Owner: Cedar Lake Mining, Inc. Investigator: Cleo Stubbs	Date: 11/15/2009 County: Blount State: Alabama
Do Normal Circumstances exist on the site? No Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: OP-3

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Liquidambar styraciflua	T	FAC	9. _____	_____	Pick One
2. Pinus echinata	T	FAC	10. _____	_____	Pick One
3. Pinus Taeda	T	FAC	11. _____	_____	Pick One
4. Liriodendron styraciflua	T	FAC	12. _____	_____	Pick One
5. Smilax glauca	V	FAC	13. _____	_____	Pick One
6. Acer rubrum	T	FAC	14. _____	_____	Pick One
7. _____	_____	Pick One	15. _____	_____	Pick One
8. _____	_____	Pick One	16. _____	_____	Pick One

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 80 %

Remarks: This observation point is located in the vicinity of a stream. The area has some disturbance from the previous mining operation. There is some evidence of original soil/landscape.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: >30 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: The hydrology has been altered as a result of the mining operation several years ago.

SOILS

Map Unit Name
(Series and Phase): Nauvoo (variant)

Taxonomy (Subgroup): Typic Hapludult

Drainage Class: WD
Field Observations
Confirm Mapped Type? No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Contrast	Texture, Concretions, Structure, etc.
0 - 7	A	10 YR 4/4			L
7 - 18	Bt1	7.5YR 5/6			CL
18 - 24	Bt2	5YR 5/6	10YR 7/4	f2d	SICL

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: Observation point is located in the vicinity of intermittent stream. Some soil disturbance from previous mining operation.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? No

Is this Sampling Point Within a Wetland? No

Remarks: This area is not a wetland

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Bull Gap Mine - Blount County, Alabama Applicant/Owner: Cedar Lake Mining, Inc. Investigator: Cleo Stubbs	Date: 11/15/2009 County: Blount State: Alabama
Do Normal Circumstances exist on the site? No Is the site significantly disturbed (Atypical Situation)? Yes Is the area a potential Problem Area? Yes (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: OP-4

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cephalanthus occidentalis	S	OBL	9. _____	_____	Pick One
2. Liquidambar styraciflua	T	FAC	10. _____	_____	Pick One
3. Liriodendron tulipifera	T	FAC	11. _____	_____	Pick One
4. _____	_____	Pick One	12. _____	_____	Pick One
5. _____	_____	Pick One	13. _____	_____	Pick One
6. _____	_____	Pick One	14. _____	_____	Pick One
7. _____	_____	Pick One	15. _____	_____	Pick One
8. _____	_____	Pick One	16. _____	_____	Pick One

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): _____

Remarks: This observation point is located in a drainage water collection basin. The area has been significantly impacted/disturbed by previous mining operations in the area. The vegetation is OBL plant species growing in mine spoil. SEE DATA SHEET 3

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: > _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☒ Inundated
- ☒ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: The hydrology has been altered and the point is located in a drainage collection basin/pool where the upper substarte is mine spoil. SEE DATA SHEET 3

SOILS

Map Unit Name
(Series and Phase): Palmerdale (variant)

Taxonomy (Subgroup): Typic Udorthents

Drainage Class: PD
Field Observations
Confirm Mapped Type? No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Contrast	Texture, Concretions, Structure, etc.
0 - 8	A	10 YR 4/2			gr L
8 - 20	C1	10YR 3/1	10YR 6/4	f2d	gr L
20 - 25	C2	10YR 3/1	10YR 7/4	f2d	gr L

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: SEE DATA SHEET 3

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? No

Is this Sampling Point Within a Wetland? Yes

Remarks: SEE DATA SHEET 3

DATA FORM 3
ATYPICAL SITUATIONS

Applicant Name: Cedar Lake Mining, Inc.
Location: Blount County, Alabama
Plot # # 4
Application Number:
Date: 16-Nov-09
Project Name: Bull Gap Mine

A VEGETATION:

1. Type of Alteration: This site is located in previously mine area and current landscape is mainly mine spoil. The area was mined during a period know as " Pre-Law"

2. Effect on Vegetation : The original vegetation was completely removed for the mining process several years ago.

3. Previous Vegetation; Ref. sites indicate: Liquidambar styraciflua- T- FAC, Liriodendron tulipifera -T-FAC, Quercus falcata - FACU Quercus falcata-T-FACU,Pinus echinata-T-FAC, Acer rubrum -T-FAC,Smilax glauca-V-FAC

4. Hydrophytic Vegetation? Yes √ No

B SOILS:

1. Type of Alteration; A surface area mining operation has occurred at this observation point.

2. Effect on Soils: The soil area and soil horizons were completely removed during the previous mining operation.

3. Previous Soils: (Attach Documentation) Soil survey indicates area is Townley Soil or an inclusion of the State Soil Series.

4. Hydric Soils? Yes . . No √

C. HYDROLOGY:

1. Type of Alteration: This area has been mined through and it was an upland site before the mining operation.

2. Effect on Hydrology: The hydrology was previously overland flow during normal rainfall, this hydrology has been removed.

3. Previous Hydrology: (Attach documentation) Upland overland flow and the area did not have wetland hydrology.

4. Wetland Hydrology? Yes NO √

Characterized By: Cleo Stubbs

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Bull Gap Mine - Blount County, Alabama Applicant/Owner: Cedar Lake Mining, Inc. Investigator: Cleo Stubbs	Date: 11/15/2009 County: Blount State: Alabama
Do Normal Circumstances exist on the site? No Is the site significantly disturbed (Atypical Situation)? Yes Is the area a potential Problem Area? Yes (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: OP-5

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cephalanthus occidentalis	S	OBL	9. _____	_____	Pick One
2. Liquidambar styraciflua	T	FAC	10. _____	_____	Pick One
3. Liriodendron tulipifera	T	FAC	11. _____	_____	Pick One
4. Salix nigra marsh	T	OBL	12. _____	_____	Pick One
5. _____	_____	Pick One	13. _____	_____	Pick One
6. _____	_____	Pick One	14. _____	_____	Pick One
7. _____	_____	Pick One	15. _____	_____	Pick One
8. _____	_____	Pick One	16. _____	_____	Pick One

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): _____

Remarks: This observation point is located in a drainage water collection basin. The area has been significantly impacted/disturbed by previous mining operations in the area. The vegetation is OBL plant species growing in mine spoil. SEE DATA SHEET 3

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: > _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☒ Inundated
- ☒ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: The hydrology has been altered and the point is located in a drainage collection basin/pool where the upper substarte is mine spoil. SEE DATA SHEET 3

SOILS

Map Unit Name
(Series and Phase): Palmerdale (variant)

Taxonomy (Subgroup): Typic Udorthents

Drainage Class: PD
Field Observations
Confirm Mapped Type? No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Contrast	Texture, Concretions, Structure, etc.
0 - 7	A	10 YR 4/2			gr L
7 - 20	C1	10YR 3/1	10YR 6/4	f2d	gr L
20 - 25	C2	10YR 3/1	10YR 7/4	f2d	gr L

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: SEE DATA SHEET 3

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? No

Is this Sampling Point Within a Wetland? Yes

Remarks: SEE DATA SHEET 3

DATA FORM 3
ATYPICAL SITUATIONS

Applicant Name: Cedar Lake Mining, Inc.
Location: Blount County, Alabama
Plot # # 5
Application Number:
Date: 16-Nov-09
Project Name: Bull Gap Mine

A VEGETATION:

1. Type of Alteration: This site is located in previously mine area and current landscape is mainly mine spoil. The area was mined during a period know as " Pre-Law"

2. Effect on Vegetation : The original vegetation was completely removed for the mining process several years ago.

3. Previous Vegetation; Ref. sites indicate: Liquidambar styraciflua- T- FAC, Liriodendron tulipifera -T-FAC, Quercus falcata - FACU Quercus falcata-T-FACU,Pinus echinata-T-FAC, Acer rubrum -T-FAC,Smilax glauca-V-FAC

4. Hydrophytic Vegetation? Yes √ No

B SOILS:

1. Type of Alteration; A surface area mining operation has occurred at this observation point.

2. Effect on Soils: The soil area and soil horizons were completely removed during the previous mining operation.

3. Previous Soils: (Attach Documentation) Soil survey indicates area is Townley Soil or an inclusion of the State Soil Series.

4. Hydric Soils? Yes . . No √

C. HYDROLOGY:

1. Type of Alteration: This area has been mined through and it was an upland site before the mining operation.

2. Effect on Hydrology: The hydrology was previously overland flow during normal rainfall, this hydrology has been removed.

3. Previous Hydrology: (Attach documentation) Upland overland flow and the area did not have wetland hydrology.

4. Wetland Hydrology? Yes NO √

Characterized By: Cleo Stubbs

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Bull Gap Mine - Blount County, Alabama Applicant/Owner: Cedar Lake Mining, Inc. Investigator: Cleo Stubbs	Date: 11/15/2009 County: Blount State: Alabama
Do Normal Circumstances exist on the site? No Is the site significantly disturbed (Atypical Situation)? Yes Is the area a potential Problem Area? Yes (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: OP-6

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cephalanthus occidentalis	S	OBL	9. _____	_____	Pick One
2. Liquidambar styraciflua	T	FAC	10. _____	_____	Pick One
3. Liriodendron tulipifera	T	FAC	11. _____	_____	Pick One
4. Salix nigra marsh	T	OBL	12. _____	_____	Pick One
5. Eleocharis R.	GR	OBL	13. _____	_____	Pick One
6. _____	_____	Pick One	14. _____	_____	Pick One
7. _____	_____	Pick One	15. _____	_____	Pick One
8. _____	_____	Pick One	16. _____	_____	Pick One

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): _____

Remarks: This observation point is located in a drainage water collection basin. The area has been significantly impacted/disturbed by previous mining operations in the area. The vegetation is OBL plant species growing in mine spoil. SEE DATA SHEET 3

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: > _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☒ Inundated
- ☒ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: The hydrology has been altered and the point is located in a drainage collection basin/pool where the upper substrate is mine spoil. SEE DATA SHEET 3

SOILS

Map Unit Name
(Series and Phase): Palmerdale (variant)

Taxonomy (Subgroup): Typic Udorthents

Drainage Class: PD
Field Observations
Confirm Mapped Type? No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Contrast	Texture, Concretions, Structure, etc.
0 - 8	A	10 YR 4/2			gr L
8 - 20	C1	10YR 3/1	10YR 6/4	f2d	gr L
20 - 25	C2	10YR 3/1	10YR 7/4	f2d	gr L

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: SEE DATA SHEET 3

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? No

Is this Sampling Point Within a Wetland? Yes

Remarks: SEE DATA SHEET 3

DATA FORM 3
ATYPICAL SITUATIONS

Applicant Name: Cedar Lake Mining, Inc.
Location: Blount County, Alabama
Plot # # 6
Application Number:
Date: 16-Nov-09
Project Name: Bull Gap Mine

A VEGETATION:

1. Type of Alteration: This site is located in previously mine area and current landscape is mainly mine spoil. The area was mined during a period know as " Pre-Law"

2. Effect on Vegetation : The original vegetation was completely removed for the mining process several years ago.

3. Previous Vegetation; Ref. sites indicate: Liquidambar styraciflua- T- FAC, Liriodendron tulipifera -T-FAC, Quercus falcata - FACU Quercus falcata-T-FACU,Pinus echinata-T-FAC, Acer rubrum -T-FAC,Smilax glauca-V-FAC

4. Hydrophytic Vegetation? Yes √ No

B SOILS:

1. Type of Alteration; A surface area mining operation has occurred at this observation point.

2. Effect on Soils: The soil area and soil horizons were completely removed during the previous mining operation.

3. Previous Soils: (Attach Documentation) Soil survey indicates area is Townley Soil or an inclusion of the State Soil Series.

4. Hydric Soils? Yes . . No √

C. HYDROLOGY:

1. Type of Alteration: This area has been mined through and it was an upland site before the mining operation.

2. Effect on Hydrology: The hydrology was previously overland flow during normal rainfall, this hydrology has been removed.

3. Previous Hydrology: (Attach documentation) Upland overland flow and the area did not have wetland hydrology.

4. Wetland Hydrology? Yes NO √

Characterized By: Cleo Stubbs

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Bull Gap Mine - Blount County, Alabama Applicant/Owner: Cedar Lake Mining, Inc. Investigator: Cleo Stubbs	Date: 11/15/2009 County: Blount State: Alabama
Do Normal Circumstances exist on the site? No Is the site significantly disturbed (Atypical Situation)? Yes Is the area a potential Problem Area? Yes (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: OP-7

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cephalanthus occidentalis	S	OBL	9. _____	_____	Pick One
2. Liquidambar styraciflua	T	FAC	10. _____	_____	Pick One
3. Liriodendron tulipifera	T	FAC	11. _____	_____	Pick One
4. Salix nigra marsh	T	OBL	12. _____	_____	Pick One
5. Eleocharis R.	GR	OBL	13. _____	_____	Pick One
6. _____	_____	Pick One	14. _____	_____	Pick One
7. _____	_____	Pick One	15. _____	_____	Pick One
8. _____	_____	Pick One	16. _____	_____	Pick One

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): _____

Remarks: This observation point is located in a drainage water collection basin. The area has been significantly impacted/disturbed by previous mining operations in the area. The vegetation is OBL plant species growing in mine spoil. SEE DATA SHEET 3

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: > _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☒ Inundated
- ☒ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: The hydrology has been altered and the point is located in a drainage collection basin/pool where the upper substrate is mine spoil. SEE DATA SHEET 3

SOILS

Map Unit Name
(Series and Phase): Palmerdale (variant)

Taxonomy (Subgroup): Typic Udorthents

Drainage Class: PD
Field Observations
Confirm Mapped Type? No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Contrast	Texture, Concretions, Structure, etc.
0 - 10	A	10 YR 4/2			gr L
10- 20	C1	10YR 3/1	10YR 6/4	f2d	gr L
20 - 30	C2	10YR 3/1	10YR 7/4	f2d	gr L

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: SEE DATA SHEET 3

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? No

Is this Sampling Point Within a Wetland? Yes

Remarks: SEE DATA SHEET 3

DATA FORM 3
ATYPICAL SITUATIONS

Applicant Name: Cedar Lake Mining, Inc.
Location: Blount County, Alabama
Plot # # 7
Application Number:
Date: 16-Nov-09
Project Name: Bull Gap Mine

A VEGETATION:

1. Type of Alteration: This site is located in previously mine area and current landscape is mainly mine spoil. The area was mined during a period know as " Pre-Law"

2. Effect on Vegetation : The original vegetation was completely removed for the mining process several years ago.

3. Previous Vegetation; Ref. sites indicate: Liquidambar styraciflua- T- FAC, Liriodendron tulipifera -T-FAC, Quercus falcata - FACU Quercus falcata-T-FACU,Pinus echinata-T-FAC, Acer rubrum -T-FAC,Smilax glauca-V-FAC

4. Hydrophytic Vegetation? Yes √ No

B SOILS:

1. Type of Alteration; A surface area mining operation has occurred at this observation point.

2. Effect on Soils: The soil area and soil horizons were completely removed during the previous mining operation.

3. Previous Soils: (Attach Documentation) Soil survey indicates area is Townley Soil or an inclusion of the State Soil Series.

4. Hydric Soils? Yes . . No √

C. HYDROLOGY:

1. Type of Alteration: This area has been mined through and it was an upland site before the mining operation.

2. Effect on Hydrology: The hydrology was previously overland flow during normal rainfall, this hydrology has been removed.

3. Previous Hydrology: (Attach documentation) Upland overland flow and the area did not have wetland hydrology.

4. Wetland Hydrology? Yes NO √

Characterized By: Cleo Stubbs

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Bull Gap Mine - Blount County, Alabama Applicant/Owner: Cedar Lake Mining, Inc. Investigator: Cleo Stubbs	Date: 11/15/2009 County: Blount State: Alabama
Do Normal Circumstances exist on the site? No Is the site significantly disturbed (Atypical Situation)? Yes Is the area a potential Problem Area? Yes (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: OP-8

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cephalanthus occidentalis	S	OBL	9. _____	_____	Pick One
2. Liquidambar styraciflua	T	FAC	10. _____	_____	Pick One
3. Liriodendron tulipifera	T	FAC	11. _____	_____	Pick One
4. Salix nigra marsh	T	OBL	12. _____	_____	Pick One
5. Eleocharis R.	GR	OBL	13. _____	_____	Pick One
6. _____	_____	Pick One	14. _____	_____	Pick One
7. _____	_____	Pick One	15. _____	_____	Pick One
8. _____	_____	Pick One	16. _____	_____	Pick One

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): _____

Remarks: This observation point is located in a drainage water collection basin. The area has been significantly impacted/disturbed by previous mining operations in the area. The vegetation is OBL plant species growing in mine spoil. SEE DATA SHEET 3

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: > _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☒ Inundated
- ☒ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: The hydrology has been altered and the point is located in a drainage collection basin/pool where the upper substarte is mine spoil. SEE DATA SHEET 3

SOILS

Map Unit Name
(Series and Phase): Palmerdale (variant)

Taxonomy (Subgroup): Typic Udorthents

Drainage Class: PD
Field Observations
Confirm Mapped Type? No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Contrast	Texture, Concretions, Structure, etc.
0 - 9	A	10 YR 4/2			gr L
9 - 23	C1	10YR 3/1	10YR 6/4	f2d	gr L
23 - 27	C2	10YR 3/1	10YR 7/4	f2d	gr L

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: SEE DATA SHEET 3

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? No

Is this Sampling Point Within a Wetland? Yes

Remarks: SEE DATA SHEET 3

DATA FORM 3
ATYPICAL SITUATIONS

Applicant Name: Cedar Lake Mining, Inc.
Location: Blount County, Alabama
Plot # # 8
Application Number:
Date: 16-Nov-09
Project Name: Bull Gap Mine

A VEGETATION:

1. Type of Alteration: This site is located in previously mine area and current landscape is mainly mine spoil. The area was mined during a period know as " Pre-Law"

2. Effect on Vegetation : The original vegetation was completely removed for the mining process several years ago.

3. Previous Vegetation; Ref. sites indicate: Liquidambar styraciflua- T- FAC, Liriodendron tulipifera -T-FAC, Quercus falcata - FACU Quercus falcata-T-FACU,Pinus echinata-T-FAC, Acer rubrum -T-FAC,Smilax glauca-V-FAC

4. Hydrophytic Vegetation? Yes _____ No √

B SOILS:

1. Type of Alteration; A surface area mining operation has occurred at this observation point.

2. Effect on Soils: The soil area and soil horizons were completely removed during the previous mining operation.

3. Previous Soils: (Attach Documentation) Soil survey indicates area is Townley Soil or an inclusion of the State Soil Series.

4. Hydric Soils? Yes . . _____ No √

C. HYDROLOGY:

1. Type of Alteration: This area has been mined through and it was an upland site before the mining operation.

2. Effect on Hydrology: The hydrology was previously overland flow during normal rainfall, this hydrology has been removed.

3. Previous Hydrology: (Attach documentation) Upland overland flow and the area did not have wetland hydrology.

4. Wetland Hydrology? Yes _____ NO √

Characterized By: Cleo Stubbs

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Bull Gap Mine - Blount County, Alabama Applicant/Owner: Cedar Lake Mining, Inc. Investigator: Cleo Stubbs	Date: 11/15/2009 County: Blount State: Alabama
Do Normal Circumstances exist on the site? No Is the site significantly disturbed (Atypical Situation)? Yes Is the area a potential Problem Area? Yes (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: OP- 9

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cephalanthus occidentalis	S	OBL	9. _____	_____	Pick One
2. Liquidambar styraciflua	T	FAC	10. _____	_____	Pick One
3. Liriodendron tulipifera	T	FAC	11. _____	_____	Pick One
4. Salix nigra marsh	T	OBL	12. _____	_____	Pick One
5. Eleocharis R.	GR	OBL	13. _____	_____	Pick One
6. _____	_____	Pick One	14. _____	_____	Pick One
7. _____	_____	Pick One	15. _____	_____	Pick One
8. _____	_____	Pick One	16. _____	_____	Pick One

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): _____

Remarks: This observation point is located in a drainage water collection basin. The area has been significantly impacted/disturbed by previous mining operations in the area. The vegetation is OBL plant species growing in mine spoil. SEE DATA SHEET 3

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: > _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☒ Inundated
- ☒ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: The hydrology has been altered and the point is located in a drainage collection basin/pool where the upper substarte is mine spoil. SEE DATA SHEET 3

SOILS

Map Unit Name
(Series and Phase): Palmerdale (variant)

Taxonomy (Subgroup): Typic Udorthents

Drainage Class: PD
Field Observations
Confirm Mapped Type? No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Contrast	Texture, Concretions, Structure, etc.
0 - 9	A	10 YR 4/2			gr L
9 - 23	C1	10YR 3/1	10YR 6/4	f2d	gr L
23 - 27	C2	10YR 3/1	10YR 7/4	f2d	gr L

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: SEE DATA SHEET 3

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? No

Is this Sampling Point Within a Wetland? Yes

Remarks: SEE DATA SHEET 3

DATA FORM 3
ATYPICAL SITUATIONS

Applicant Name: Cedar Lake Mining, Inc.
Location: Blount County, Alabama
Plot # # 9
Application Number:
Date: 16-Nov-09
Project Name: Bull Gap Mine

A VEGETATION:

1. Type of Alteration: This site is located in previously mine area and current landscape is mainly mine spoil. The area was mined during a period know as " Pre-Law"

2. Effect on Vegetation : The original vegetation was completely removed for the mining process several years ago.

3. Previous Vegetation; Ref. sites indicate: Liquidambar styraciflua- T- FAC, Liriodendron tulipifera -T-FAC, Quercus falcata - FACU Quercus falcata-T-FACU,Pinus echinata-T-FAC, Acer rubrum -T-FAC,Smilax glauca-V-FAC

4. Hydrophytic Vegetation? Yes _____ No √

B SOILS:

1. Type of Alteration; A surface area mining operation has occurred at this observation point.

2. Effect on Soils: The soil area and soil horizons were completely removed during the previous mining operation.

3. Previous Soils: (Attach Documentation) Soil survey indicates area is Townley Soil or an inclusion of the State Soil Series.

4. Hydric Soils? Yes . . _____ No √

C. HYDROLOGY:

1. Type of Alteration: This area has been mined through and it was an upland site before the mining operation.

2. Effect on Hydrology: The hydrology was previously overland flow during normal rainfall, this hydrology has been removed.

3. Previous Hydrology: (Attach documentation) Upland overland flow and the area did not have wetland hydrology.

4. Wetland Hydrology? Yes _____ NO √

Characterized By: Cleo Stubbs

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Bull Gap Mine - Blount County, Alabama Applicant/Owner: Cedar Lake Mining, Inc. Investigator: Cleo Stubbs	Date: 11/15/2009 County: Blount State: Alabama
Do Normal Circumstances exist on the site? No Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: OP-10

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Liquidambar styraciflua	T	FAC	9. _____	_____	Pick One
2. _____	_____	Pick One	10. _____	_____	Pick One
3. Pinus Taeda	T	FAC	11. _____	_____	Pick One
4. Liriodendron styraciflua	T	FAC	12. _____	_____	Pick One
5. Smilax glauca	V	FAC	13. _____	_____	Pick One
6. _____	_____	Pick One	14. _____	_____	Pick One
7. _____	_____	Pick One	15. _____	_____	Pick One
8. _____	_____	Pick One	16. _____	_____	Pick One

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 75 %

Remarks: This observation point is located on an upland site. The area has some disturbance from the previous mining operation. There is some evidence of original soil/landscape.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: >30 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: The hydrology has been altered as a result of the mining operation several years ago.

SOILS

Map Unit Name
(Series and Phase): Nauvoo (variant)

Taxonomy (Subgroup): Typic Hapludult

Drainage Class: WD
Field Observations
Confirm Mapped Type? No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Contrast	Texture, Concretions, Structure, etc.
0 - 3	A	10 YR 4/4			L
3 - 14	Bt1	7.5YR 5/6			CL
14- 20	Bt2	5YR 5/6	10YR 7/4	f2d	SICL

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: Observation point is located on an upland landscape.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? No

Is this Sampling Point Within a Wetland? No

Remarks: This area is not a wetland

ADVERSE IMPACT

FACTORS FOR RIVERINE SYSTEMS WORKSHEET

Stream Type Impacted	Intermittent 0.1			1St or 2nd Order Perennial Stream 0.8			> 2nd Order Perennial Stream 0.4		
Priority Area	Tertiary 0.1			Secondary 0.4			Primary 0.8		
Existing Condition	Impaired 0.1			Somewhat Impaired 0.8			Fully Functional 1.6		
Duration	Temporary 0.05			Recurrent 0.1			Permanent 0.3		
Dominant Impact	Shade/ Clear 0.05	Utility Crossing 0.15	Below Grade Culvert 0.3	Armor 0.5	Detention /Weir 0.75	Morpho -logic Change 1.5	Impound-ment (dam) 2.0	Pipe >100' 2.2	Fill 2.5
Cumulative Impact Factor	<100' 0	100'-200 0.05	201-500' 0.1	501-1000' 0.2	> 1000 linear feet (LF) 0.1 reach 500 LF of impact (example: scaling factor for 5,280 LF of impacts = 1.1)				

Factor	10A	11A	17	20			
Stream Type Impacted	0.1	0.1	0.1	0.1			
Priority Area	0.1	0.1	0.1	0.1			
Existing Condition	0.1	0.1	0.1	0.1			
Duration	0.3	0.3	0.3	0.3			
Dominant Impact	2.5	2.5	2.5	2.5			
Cumulative Impacts Factor	0.1	0.2	0.2	0.45			
Sum of Factors M=	3.2	3.3	3.3	3.5			
Linear Feet of Stream Impacted in Reach LF=	260	640	620	2,180			
M X LF	832	2,112	2,046	7,739			

Total Mitigation Credits Required = (M x LF) = <u>12,729</u>

IN-STREAM WORK

STREAM CHANNEL/STREAMBANK RESTORATION AND RELOCATION WORKSHEET

Stream Type	Intermittent 0.05	1st or 2nd Order Perennial Stream 0.4	>2nd order Perennial Stream (bankfull width)			
			>15' 0.4	15'-30' 0.6	30'-50' 0.8	>50' 1.0
Priority Area	Tertiary 0.05	Secondary 0.2	Primary 0.05			
Existing Condition	Impaired 0.4	Somewhat Impaired 0.05				
Net Benefit	Stream Relocation 0.1	Stream Channel Restoration/Stream Bank Stabilization				
		Moderate 1.0	Good 2.0	Excellent 3.5		
Streambank Stability	Stable Banks 0.4	Moderate Stable Banks 0.2				
Instream Habitat	>5 cover types 0.35	5 cover types 0.25	4 cover types 0.15	3 cover types 0.1		
Timing of Mitigation	Before 0.15	During 0.05	After 0.0			

Factors	RSS 1				Net Benefit 5	Net Benefit 6
Stream Type	0.05					
Priority Area	0.05					
Existing Condition	0.4					
Net Benefit	2.0					
Bank Stability	0.4					
Instream Habitat	0.1					
Timing of Mitigation	0.0					
Sum Factors (M) =	3.0					
Stream lengths in Reach (do not count each bank separately) (LF)=	7,600					
Credits (C) = M X LF	22,800					
Mitigation Factor Use (MF) = 0.5 or 1.0	1.0					
Total Credits Generated C X MF =	22,800					

Total Channel Restoration/Relocation Credits Generated = . 22,880 .

RIPARIAN BUFFER RESTORATION AND PRESERVATION WORKSHEET

Stream Type	Intermittent 0.05	>2nd Order Perennial Stream 0.2	1st or 2nd Order Perennial Stream 0.4
Priority Area	Tertiary 0.05	Secondary 0.2	Primary 0.4
Net Benefit (for each side of stream)	Riparian Restoration, Enhancement, and Preservation Factors (Select values from Table 1) (MBW = Minimum Buffer Width = 50’ + 2’ / 1% slope)		
System Protection Credit	Condition: MBW restored or protected on both streambanks To calculate (Net Benefit Stream Side A+ Net Benefit Stream Side B) /2		
Timing of Mitigation	Before 0.15	During 0.05	After 0.0

Factors		RSS 1					
Stream Type		0.05					
Priority Area		0.05					
Net Benefit	Stream Side A	0.4					
	Stream Side B	0.4					
System Protection Credit Conditions Met (Buffer on both sides)		0.4					
Timing of Mitigation (None for primarily riparian preservation)	Stream Side A	0.0					
	Stream Side B	0.0					
Sum Factors (M) =		1.3					
Linear feet of Stream Buffer (LF) = (Don’t count each bank separately)		7,600					
Credit (C) = MXLF		9,880					
Mitigation Factor Use (MF) = 0.5 or 1.0		1.0					
Total Credits Generated C X MF =		9,880					

Total Riparian Restoration Credits Generated =.____9,880_____.

Wetland Rapid Assessment Procedure

Check One: x Existing Condition ___Proposed Condition **(WRAP)**

Applicant Number	Project Name	Date	Evaluator	Wetland Type
	Bull Gap Mine	1/15/2010	Stubbs	Shrub Swamp

Land Use	FLUCCS Code	Description	Wetland Acreage
Woodland	640	Wetland at the shallow edges of a drainage water collection pool.	Area # 1- 0.12 Ac.

Wildlife Utilization (WU)	Wetland Canopy (O/S)	Wetland Ground Cover (GC)
1.5	1.0	1.0

Field Hydrology (HYD)	WQ Input & Treatment (WQ)*
1.5	0.875

Habitat Support/Buffer

Buffer Type	(Score) X	(% of area)	= Sub Totals	
Woodland	1.0	75	0.75	
Bare soil/rock	.5	25	0.125	
				0.875

Land Use Category (LU)

Land Use Category	(Score) X	(% of area)	= Sub Totals
Woodland	1.0	75	0.75
Bare soil/rock	.5	25	0.125
	(LU) TOTALS		0.875

Pretreatment Category (PT)

Pretreatment Category	(Score) X	(% of area)	= Sub Totals
Woodland	1.0	75	0.75
Bare soil/rock	.5	25	0.125
	(PT) TOTALS		0.875

WRAP Score 0.375

Wildlife Utilization (WU): The area is located along the shallow edges of a drainage water pool. There is evidence of wildlife utilization but the habitat for micro invertebrates is poor.
Wetland Canopy (O/S): The wetland canopy is mainly shrub type plants < than 4' diameter. The plants provide negligible support to the function of the wetland. The site location for this wetland area adversely affects the development of a suitable and supportive wetland canopy.
Wetland Ground Cover (GC): There is minimal desirable vegetative ground cover in this wetland. The cover is mainly a few leaves and twigs. The area is inundated with shallow running water from the deep mining in the area.
Habitat Support: The habitat support buffer is < 30 feet wide. The wetland is bordered by road and high wall on adjacent sides.
Field Hydrology: The wetland hydrology is adequate to maintain existing wetland type. The site location of this wetland may affect the hydrology in the future by reducing water flow. Also, the site location limits the natural stocking of other wetland type plants.
WQ Inputs & Treatment (WQ): The vegetation adjacent to and surrounding the wetland is minimal in density. The wetland is bordered by high walls and adjacent to access roads.

*The value of WQ is obtained by adding the TOTAL scores of Land Use Category and Pretreatment category then dividing by2

Wetland Rapid Assessment Procedure

Check One: __Existing Condition _x_Proposed Condition **(WRAP)**

Applicant Number	Project Name	Date	Evaluator	Wetland Type
	Bull Gap Mine	1/15/2010	Stubbs	Shrub Swamp

Land Use	FLUCCS Code	Description	Wetland Acreage
Woodland	640	Wetland adjacent to intermittent stream with hardwood buffer area.	Area # 1 – 1.11 Ac.

Wildlife Utilization (WU)	Wetland Canopy (O/S)	Wetland Ground Cover (GC)
2.5	2.5	2.5

Field Hydrology (HYD)	WQ Input & Treatment (WQ)*
2.5	2.5

Habitat Support/Buffer

Buffer Type	(Score) X	(% of area)	= Sub Totals	
Woodland	2.5	100	2.5	
				2.5

Land Use Category (LU)

Land Use Category	(Score) X	(% of area)	= Sub Totals
Woodland	2.5	100	2.5
	(LU) TOTALS		2.5

Pretreatment Category (PT)

Pretreatment Category	(Score) X	(% of area)	= Sub Totals
Woodland	2.5	100	2.5
	(PT) TOTALS		2.5

WRAP Score 0.833

Wildlife Utilization (WU): When the wetland is fully functioning it will support a diverse population of wildlife species with food, cover, den and nesting areas. The wetland area will be utilized by medium, small and large mammals and reptiles. The wetland area will be suitable habitat for several species of aquatic plant and animal life.
Wetland Canopy (O/S): The selected plant species for the wetland area will provide excellent canopy when fully functioning. Invasive plant species will be controlled and or eliminated. The area will be maintained to support healthy, disease free trees. The wetland canopy will contain an abundant amount of wetland overstory shrub and tree canopy.
Wetland Ground Cover (GC): The wetland area will provide a healthy environment for the support of an abundant amount of desirable vegetative ground cover. The ground cover will consist of a diverse and healthy plant population for utilization by wildlife and support water quality.
Habitat Support: 50 foot buffers will be established along the wetland areas. The buffers will contain desirable plant species for utilization by wildlife. The buffer areas will provide food, cover and nesting areas for several species of wildlife. Buffer areas will be connected to other wildlife corridors.
Field Hydrology: The hydrologic regime will be adequate to support/maintain the wetland area. The hydroperiod will sustain existing plants through critical functioning periods.
WQ Inputs & Treatment (WQ): The wetland and surrounding areas will have sufficient ground cover, upper and lower canopy to provide a good filter for water entering the wetland area. When the area adjacent to the wetland is fully functioning, it will improve water quality for the wetland and connecting aquatic resources.

*The value of WQ is obtained by adding the TOTAL scores of Land Use Category and Pretreatment category then dividing by2

Wetland Rapid Assessment Procedure

Check One: x Existing Condition ___Proposed Condition **(WRAP)**

Applicant Number	Project Name	Date	Evaluator	Wetland Type
	Bull Gap Mine	1/15/2010	Stubbs	Shrub Swamp

Land Use	FLUCCS Code	Description	Wetland Acreage
Woodland	640	Wetland at the shallow/drainage out of a sediment basin.	Area # 2- 0.80 Ac.

Wildlife Utilization (WU)	Wetland Canopy (O/S)	Wetland Ground Cover (GC)
.5	1.0	1.0

Field Hydrology (HYD)	WQ Input & Treatment (WQ)*
1.5	0.625

Habitat Support/Buffer

Buffer Type	(Score) X	(% of area)	= Sub Totals	
Woodland	1.0	25	0.25	
Bare soil/rock	.5	75	0.375	
				0.625

Land Use Category (LU)

Land Use Category	(Score) X	(% of area)	= Sub Totals
Woodland	1.0	25	0.25
Bare soil/rock	.5	75	0.375
	(LU) TOTALS		0.625

Pretreatment Category (PT)

Pretreatment Category	(Score) X	(% of area)	= Sub Totals
Woodland	1.0	25	0.25
Bare soil/rock	.5	75	0.375
	(PT) TOTALS		0.625

WRAP Score **0.291**

Wildlife Utilization (WU): The area is located at the shallow end of a drainage water collection pool between two high walls. There is minimal evidence of wildlife utilization and the habitat for micro invertebrates is poor.
Wetland Canopy (O/S): The wetland canopy is mainly shrub type plants < than 4" in diameter. The plants provide negligible support to the function of the wetland. The site location for this wetland area adversely affects the development of a suitable and supportive wetland canopy.
Wetland Ground Cover (GC): There is minimal desirable vegetative ground in this wetland. The cover is mainly a few leaves and twigs. The area is inundated with shallow running water from the deep mining in the area.
Habitat Support: The habitat support buffer is < 30 feet wide. The wetland is bordered by road and high wall on adjacent sides.
Field Hydrology: The wetland hydrology is barely adequate to maintain existing wetland type. The site location of this wetland may affect future hydrology by reducing water flow. Also, the site location limits the natural stocking of other wetland type plants. The wetland is dry in late spring and fall.
WQ Inputs & Treatment (WQ): The vegetation adjacent to and surrounding the wetland is minimal in density. The wetland is bordered by high walls and adjacent to access roads.

*The value of WQ is obtained by adding the TOTAL scores of Land Use Category and Pretreatment category then dividing by2

Wetland Rapid Assessment Procedure

Check One: __Existing Condition _x_Proposed Condition **(WRAP)**

Applicant Number	Project Name	Date	Evaluator	Wetland Type
	Bull Gap Mine	1/15/2010	Stubbs	Shrub Swamp

Land Use	FLUCCS Code	Description	Wetland Acreage
Woodland	640	Wetland adjacent to intermittent stream with hardwood buffer area.	Area # 2 – 0.39 Ac.

Wildlife Utilization (WU)	Wetland Canopy (O/S)	Wetland Ground Cover (GC)
3.0	2.5	2.5

Field Hydrology (HYD)	WQ Input & Treatment (WQ)*
2.5	2.5

Habitat Support/Buffer

Buffer Type	(Score) X	(% of area)	= Sub Totals	
Woodland	2.5	100	2.5	
				2.5

Land Use Category (LU)

Land Use Category	(Score) X	(% of area)	= Sub Totals
Woodland	2.5	100	2.5
	(LU) TOTALS		2.5

Pretreatment Category (PT)

Pretreatment Category	(Score) X	(% of area)	= Sub Totals
Woodland	2.5	100	2.5
	(PT) TOTALS		2.5

WRAP Score 0.861

Wildlife Utilization (WU): When the wetland is fully functioning it will support a diverse population of wildlife species with food, cover, den and nesting areas. The wetland area will be utilized by medium, small and large mammals and reptiles. The wetland area will be suitable habitat for several species of aquatic plant and animal life. It will support locally adapted species of micro-invertebrates.
Wetland Canopy (O/S): The selected plant species for the wetland area will provide excellent canopy when fully functioning. Invasive plant species will be controlled and or eliminated. The area will be maintained to support healthy, disease free trees. The wetland canopy will contain an abundant amount of wetland overstory shrub and tree canopy.
Wetland Ground Cover (GC): The wetland area will provide a healthy environment for the support of an abundant amount of desirable vegetative ground cover. The ground cover will consist of a diverse and healthy plant population for utilization by wildlife and support water quality.
Habitat Support: 50 foot buffers will be established along the wetland areas. The buffers will contain desirable plant species for utilization by wildlife. The buffer areas will provide food, cover and nesting areas for several species of wildlife. Buffer areas will be connected to other wildlife corridors.
Field Hydrology: The hydrologic regime will be adequate to support/maintain the wetland area. The hydroperiod will sustain existing plants through critical functioning periods.
WQ Inputs & Treatment (WQ): The wetland and surrounding areas will have sufficient ground cover, upper and lower canopy to provide a good filter for water entering the wetland area. When the area adjacent to the wetland is fully functioning, it will improve water quality for the wetland and connecting aquatic resources.

*The value of WQ is obtained by adding the TOTAL scores of Land Use Category and Pretreatment category then dividing by2

Wetland Rapid Assessment Procedure

Check One: x Existing Condition ___Proposed Condition **(WRAP)**

Applicant Number	Project Name	Date	Evaluator	Wetland Type
	Bull Gap Mine	1/15/2010	Stubbs	Shrub Swamp

Land Use	FLUCCS Code	Description	Wetland Acreage
Woodland	640	This wetland area is located along the edges of a drainage water collection pool.	Area # 3- 0.15 Ac.

Wildlife Utilization (WU)	Wetland Canopy (O/S)	Wetland Ground Cover (GC)
1.0	1.0	1.0

Field Hydrology (HYD)	WQ Input & Treatment (WQ)*
1.5	0.75

Habitat Support/Buffer

Buffer Type	(Score) X	(% of area)	= Sub Totals	
Woodland, road	1.0	50	0.50	
Rock/bare soil	.5	50	0.25	
				0.75

Land Use Category (LU)

Land Use Category	(Score) X	(% of area)	= Sub Totals
Woodland	1.0	50	0.50
Bare soil/rock	.5	50	0.25
	(LU) TOTALS		0.75

Pretreatment Category (PT)

Pretreatment Category	(Score) X	(% of area)	= Sub Totals
Woodland	1.0	50	0.50
Bare soil/rock	.5	50	0.25
	(PT) TOTALS		0.75

WRAP Score **0.333**

Wildlife Utilization (WU): The area is located at the shallow end of a drainage water collection pool and it is bordered by an access road and high walls. There is minimal evidence of wildlife utilization.
Wetland Canopy (O/S): The wetland canopy is a few shrub type plants < than 4' diameter. The plants provide negligible support to the function of the wetland. The site location for this wetland area adversely affects the development of a suitable and supportive wetland canopy.
Wetland Ground Cover (GC): There is some desirable vegetative ground in this wetland. The cover is a few grasses, saplings and sedges. The area is inundated with shallow running water from the deep mining in the area.
Habitat Support: The habitat support buffer is < 30 feet wide. The wetland is bordered by a road and high wall on adjacent sides.
Field Hydrology: The wetland hydrology is barely sufficient to maintain existing wetland type. The site location of this wetland may affect future hydrology by reducing water flow. Also, the site location limits the natural stocking of other wetland type plants.
WQ Inputs & Treatment (WQ): The vegetation adjacent to and surrounding the wetland is minimal in density. The wetland is bordered by high walls and adjacent to access roads.

*The value of WQ is obtained by adding the TOTAL scores of Land Use Category and Pretreatment category then dividing by2

Wetland Rapid Assessment Procedure

Check One: x Existing Condition ___Proposed Condition **(WRAP)**

Applicant Number	Project Name	Date	Evaluator	Wetland Type
	Bull Gap Mine	1/15/2010	Stubbs	Shrub Swamp

Land Use	FLUCCS Code	Description	Wetland Acreage
Woodland	640	Wetland area is located along the edges of a drainage water collection pool.	Area # 4- 0.10 Ac.

Wildlife Utilization (WU)	Wetland Canopy (O/S)	Wetland Ground Cover (GC)
1.0	1.0	1.0

Field Hydrology (HYD)	WQ Input & Treatment (WQ)*
1.5	0.75

Habitat Support/Buffer

Buffer Type	(Score) X	(% of area)	= Sub Totals	
Woodland	1.0	50	0.50	
Bare soil/rock	.5	50	0.25	
				0.75

Land Use Category (LU)

Land Use Category	(Score) X	(% of area)	= Sub Totals
Woodland	1.0	50	0.50
Bare soil/rock	.5	50	0.25
	(LU) TOTALS		0.75

Pretreatment Category (PT)

Pretreatment Category	(Score) X	(% of area)	= Sub Totals
Woodland	1.0	50	0.50
Bare soil/rock	.5	50	0.25
	(PT) TOTALS		0.75

WRAP Score 0.333

Wildlife Utilization (WU): The area is located at the shallow end of a drainage water collection pool and it is bordered by an access road and high walls. There is minimal evidence of wildlife utilization.
Wetland Canopy (O/S): The wetland canopy is mainly shrub type plants < than 4' diameter. The plants provide negligible support to the function of the wetland. The site location for this wetland area adversely affects the development of a suitable and supportive wetland canopy.
Wetland Ground Cover (GC): There is some desirable vegetative ground in this wetland. The cover is a few grasses, saplings and sedges. The area is inundated with shallow running water from the deep mining in the area.
Habitat Support: The habitat support buffer is < 30 feet wide. The wetland is bordered by road and high wall on adjacent sides.
Field Hydrology: The wetland hydrology is minimally sufficient to maintain existing wetland type. The site location of this wetland may affect future hydrology by reducing water flow. Also, the site location limits the natural stocking of other wetland type plants.
WQ Inputs & Treatment (WQ): The vegetation adjacent to and surrounding the wetland is minimal in density and cover. The wetland is bordered by high walls and adjacent to access roads.

*The value of WQ is obtained by adding the TOTAL scores of Land Use Category and Pretreatment category then dividing by2

Wetland Rapid Assessment Procedure

Check One: x Existing Condition ___Proposed Condition **(WRAP)**

Applicant Number	Project Name	Date	Evaluator	Wetland Type
	Bull Gap Mine	1/15/2010	Stubbs	Shrub Swamp/Adj.

Land Use	FLUCCS Code	Description	Wetland Acreage
Woodland	640	Wetland adjacent to small drainage way in previously mine area.	Area # 5- 0.19 Ac.

Wildlife Utilization (WU)	Wetland Canopy (O/S)	Wetland Ground Cover (GC)
1.5	1.0	1.5

Field Hydrology (HYD)	WQ Input & Treatment (WQ)*
1.5	0.875

Habitat Support/Buffer

Buffer Type	(Score) X	(% of area)	= Sub Totals	
Woodland	1.0	75	0.75	
Bare soil/rock	.5	25	0.125	
				0.875

Land Use Category (LU)

Land Use Category	(Score) X	(% of area)	= Sub Totals
Woodland	1.0	75	0.75
Bare soil/rock	.5	25	0.125
	(LU) TOTALS		0.875

Pretreatment Category (PT)

Pretreatment Category	(Score) X	(% of area)	= Sub Totals
Woodland	1.0	75	0.75
Bare soil/rock	.5	25	0.125
	(PT) TOTALS		0.875

WRAP Score 0.402

Wildlife Utilization (WU): The area is located adjacent to a created drainage way. There is evidence of wildlife utilization such as raccoon, deer and rabbits.
Wetland Canopy (O/S): The wetland canopy is only a few shrub type plants < than 4' diameter. The plants provide some support to the function of the wetland. The site location for this wetland is suitable for a diversity of wetland type plants.
Wetland Ground Cover (GC): There is some desirable vegetative ground in this wetland. The cover is mainly grasses, saplings and sedges. The area is inundated with shallow running water from the deep mining in the area.
Habitat Support: The habitat support buffer is >30 feet wide. It is bordered by a small access road. The vegetation is a mixture of shrubs and scattered oak. There are few trees for nesting and there is no evidence of den trees. The surrounding vegetation provides minimal amounts of food for wildlife.
Field Hydrology: The wetland hydrology is barely adequate to maintain existing wetland type. The site location of this wetland may affect future hydrology by reducing water flow. This site is suitable for the development of a diverse plant.
WQ Inputs & Treatment (WQ): The vegetation surrounding the wetland is a mixture of mature trees and saplings. There is evidence of bare soil as result of previous mining activities. However, existing vegetation provides filter for water entering the wetland.

*The value of WQ is obtained by adding the TOTAL scores of Land Use Category and Pretreatment category then dividing by2

Wetland Rapid Assessment Procedure

Check One: x Existing Condition ___Proposed Condition **(WRAP)**

Applicant Number	Project Name	Date	Evaluator	Wetland Type
	Bull Gap Mine	1/15/2010	Stubbs	Shrub Swamp

Land Use	FLUCCS Code	Description	Wetland Acreage
Woodland	640	Wetland area is along the shallow edges of a drainage water collection pool.	Area # 6- 0.23 Ac.

Wildlife Utilization (WU)	Wetland Canopy (O/S)	Wetland Ground Cover (GC)
1.0	0.5	1.0

Field Hydrology (HYD)	WQ Input & Treatment (WQ)*
1.5	0.875

Habitat Support/Buffer

Buffer Type	(Score) X	(% of area)	= Sub Totals	
Woodland	1.0	75	0.75	
Bare soil/rock	.5	25	0.125	
				0.875

Land Use Category (LU)

Land Use Category	(Score) X	(% of area)	= Sub Totals
Woodland	1.0	75	0.75
Bare soil/rock	.5	25	0.125
	(LU) TOTALS		0.875

Pretreatment Category (PT)

Pretreatment Category	(Score) X	(% of area)	= Sub Totals
Woodland	1.0	75	0.75
Bare soil/rock	.5	25	0.125
	(PT) TOTALS		0.875

WRAP Score 0.319

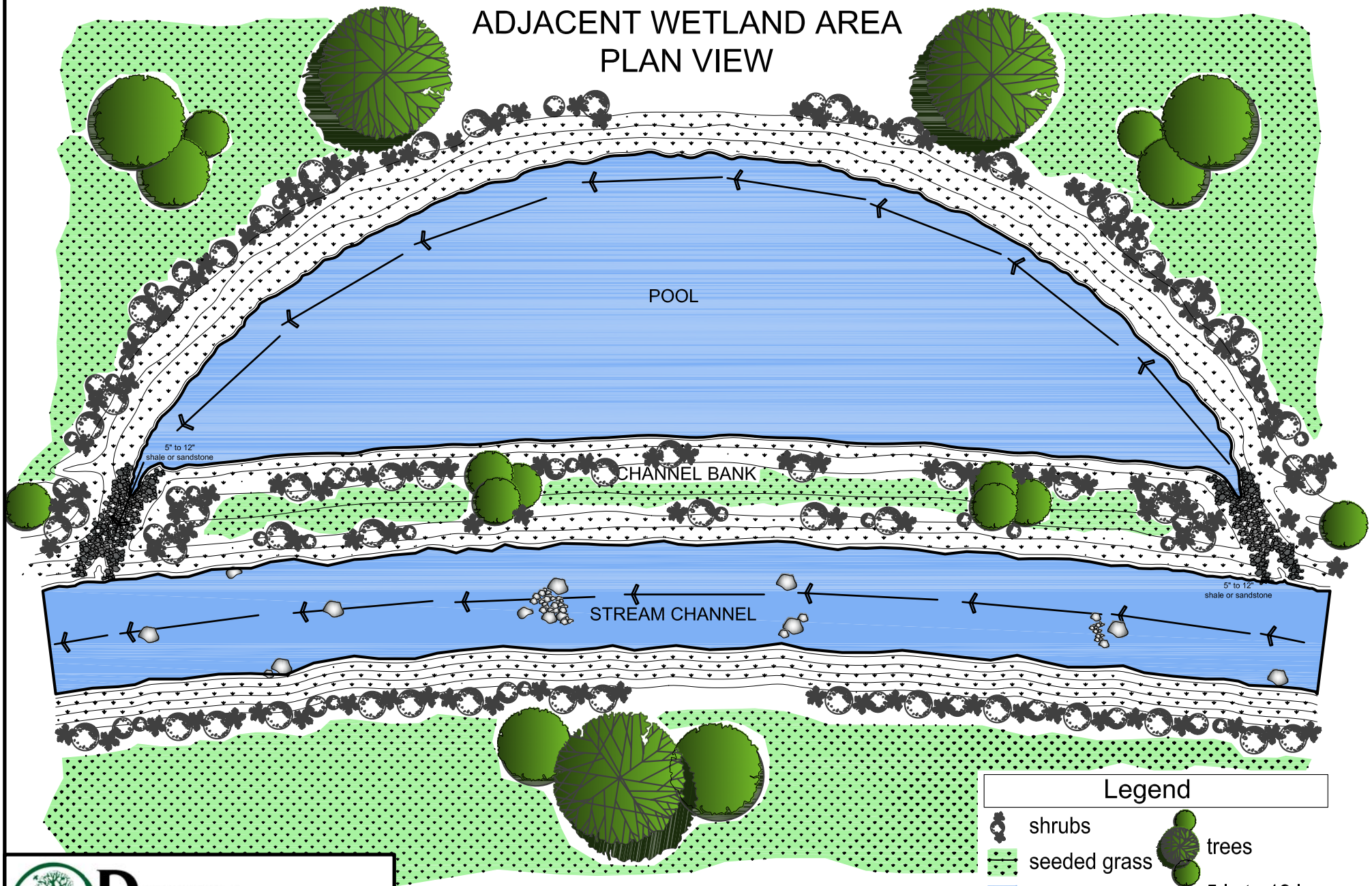
Wildlife Utilization (WU): The area is located at the shallow end of a drainage water collection pool and it is bordered by an access road and high walls. There is minimal evidence of wildlife utilization.
Wetland Canopy (O/S): The wetland canopy is a few shrub type plants < than 4' diameter. The plants provide negligible support to the function of the wetland. The site location for this wetland area adversely affects the development of a suitable and supportive wetland canopy.
Wetland Ground Cover (GC): There is some desirable vegetative ground in this wetland. The cover is mainly grasses, saplings and sedges. The area is inundated with shallow running water from the deep mining in the area.
Habitat Support: The habitat support buffer is a mixture of saplings, shrubs, and scattered mature trees. There are only a few den trees and a small amount of mature trees suitable for nesting and as a source of food.
Field Hydrology: The wetland hydrology is barely adequate to maintain existing wetland type. The site location of this wetland may affect future hydrology by reducing water flow. Also, the site location limits the natural stocking of other wetland type plants.
WQ Inputs & Treatment (WQ): The vegetation surrounding the wetland is a mixture of mature trees and saplings. There is evidence of bare soil as result of previous mining activities. However, existing vegetation provides filter for water entering the wetland.

*The value of WQ is obtained by adding the TOTAL scores of Land Use Category and Pretreatment category then dividing by2

Wetland Credit Calculation Worksheet

Site	WRAP	X	Acres	=	Credits		Temporal Lag	Proximity Factor	=	Realized Credits
Stream Side Wetlands (ex 1)	0.375		0.12		-0.045		NA	NA		-0.045
Stream Side Wetland (ex 2)	0.291		0.80		-0.232					-0.232
Stream Side Wetland (ex 3)	0.333		0.15		-0.049					-0.049
Semi isolated wetland area (ex 4)	0.333		0.10		-0.033					-0.033
Semi isolated wetland area (ex 5)	0.402		0.19		-0.076					-0.076
Stream Side Wetland (ex 6)	0.319		0.23		-0.073					-0.073
									Total pre mined	***-0.508***
Stream side adj. wetland (pro 1)	0.833		1.11		0.924		0.9195			*+0.849*
Created adj. wetland (pro 2)	0.861		0.39		0.335		0.9195			*+0.308*
									Total post mined	**+1.15**
									Credits Gained	+1.15
									Credits Lost	-0.508
									Credit Balance	+0.642

CONCEPTUAL DRAWING OF ADJACENT WETLAND AREA PLAN VIEW



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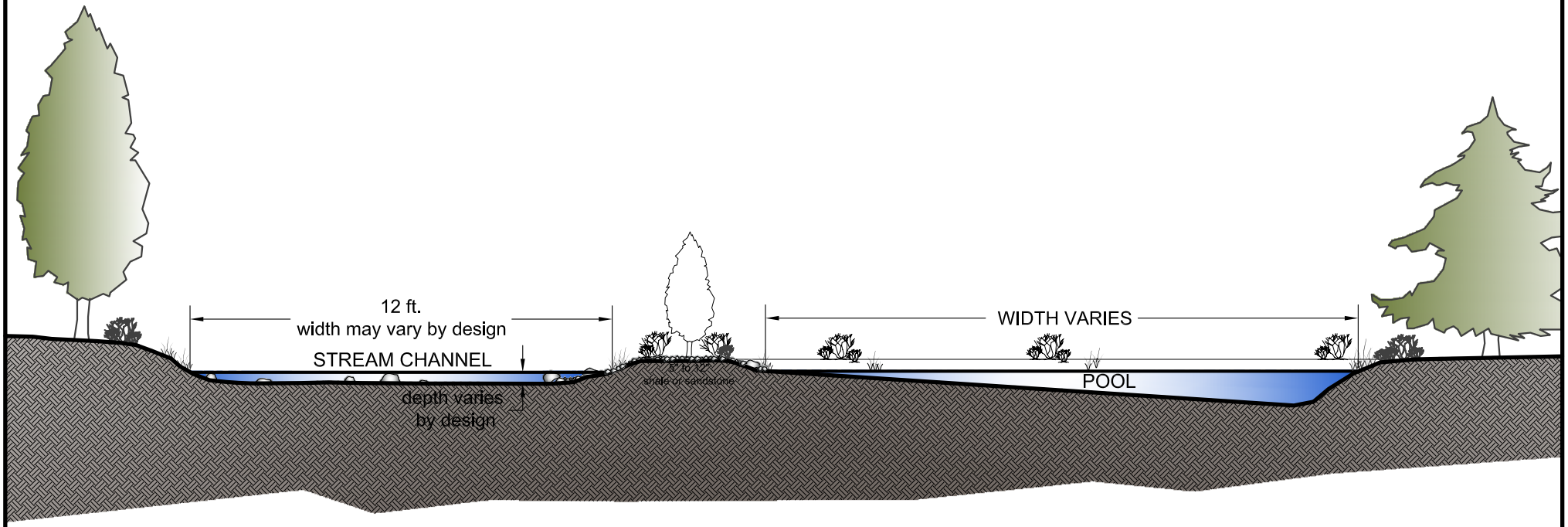
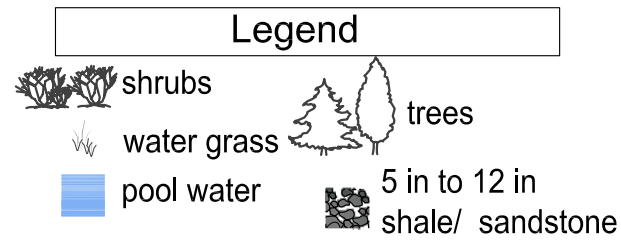
CONCEPTUAL DRAWING OF ADJACENT WETLAND AREA SECTION VIEW





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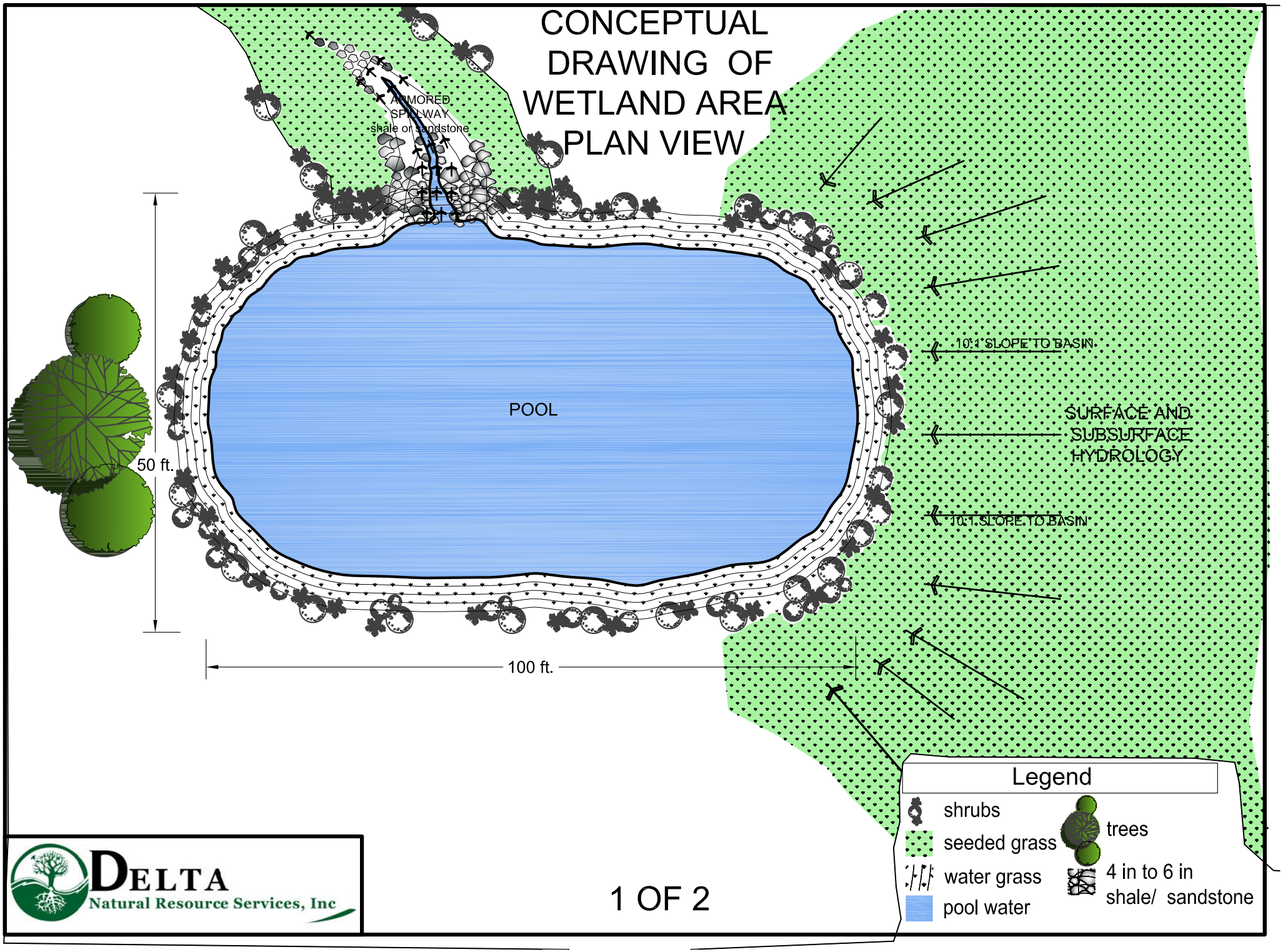
CONCEPTUAL DRAWING OF WETLAND AREA PLAN VIEW



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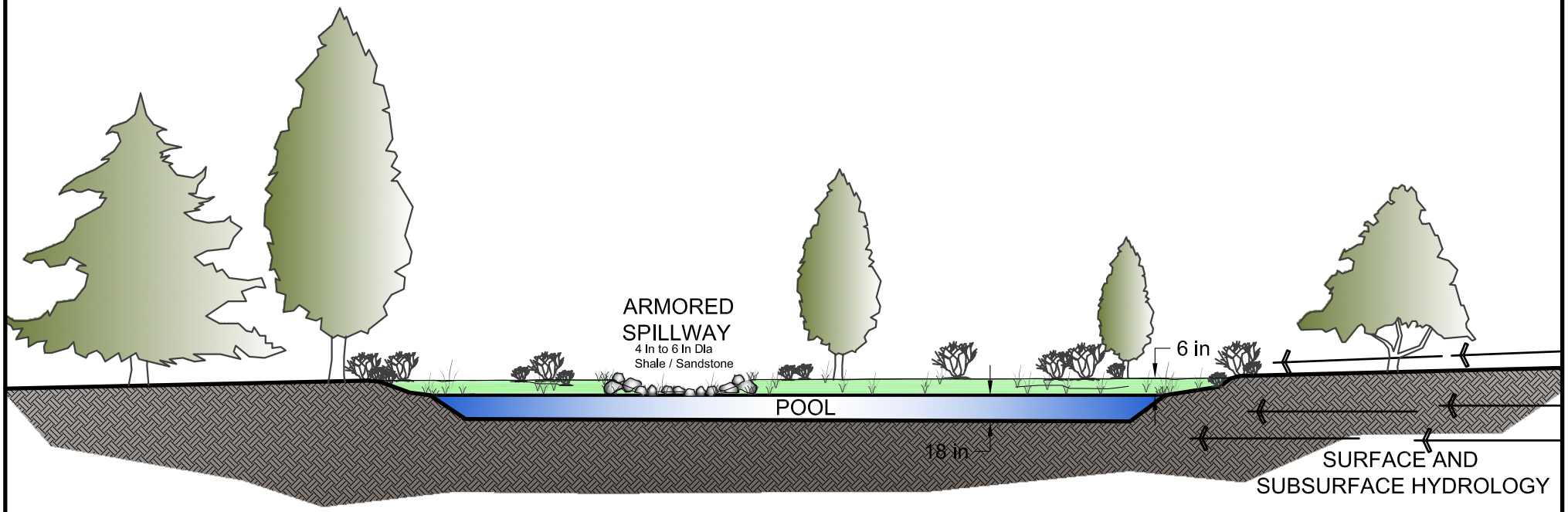
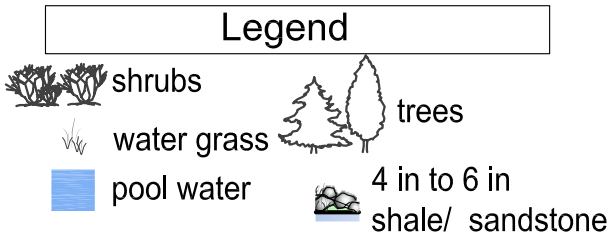
CONCEPTUAL DRAWING OF WETLAND AREA SECTIONAL VIEW





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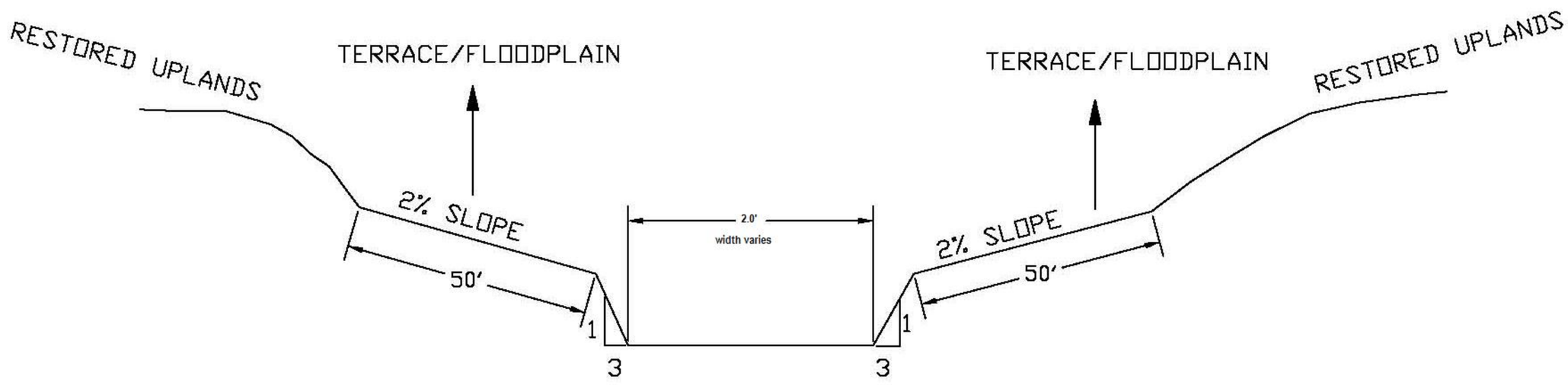
PLANNED CROSS-SECTIONAL VIEW
OF RESTORED EPHEMERAL STREAM



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Date

Field Book	Pages	Drawing Pt
Revision	Date	By

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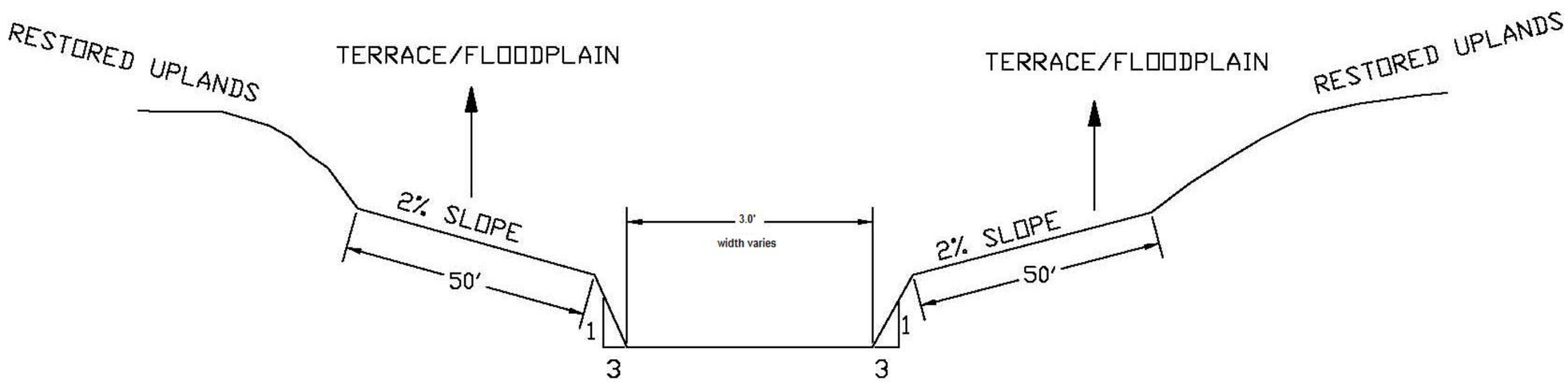
Date: 12/12/08 Drawn By: DSH	Work Order No:	Scale:
Computer File No:	Calculator File:	Sheet 1 of 1

PLANNED CROSS-SECTIONAL VIEW
OF RESTORED INTERMITTENT STREAM



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Field Book	Pages	Drawing #

Revision	Date	By

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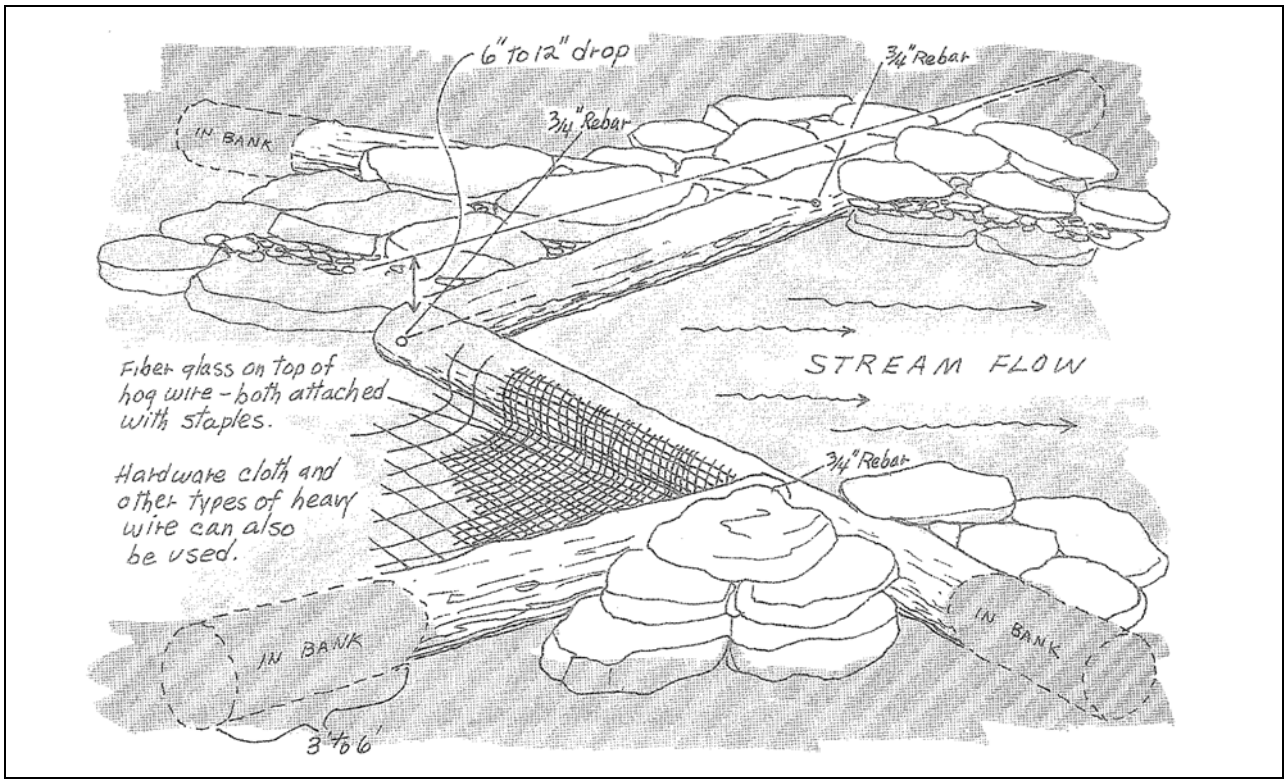
Date: 12/12/98 Drawn By: BGH	Work Order No:	Scale:
Computer File No:	Calculator File:	Sheet 1 of 1

TYPICALS FOR STREAM ENHANCEMENT AND RECONSTRUCTION

Wedge Dam

Wedge dams are best suited in channels where there is a break in gradient with a steeper section immediately upstream.
The two main logs in the dam should face upstream at a 45-degree angle to stream flow with the two brace logs pinned to the main logs at about a 90 degree angle. The butts of the two main logs should extend into the streambank 3'-6'. There should be a 6"-12" drop from the top of the check dam to the water. Once the logs are in place, attach the howgwire to the upperside of the log so that it extends upstream. Put a layer of gravel or flat stones on top of the

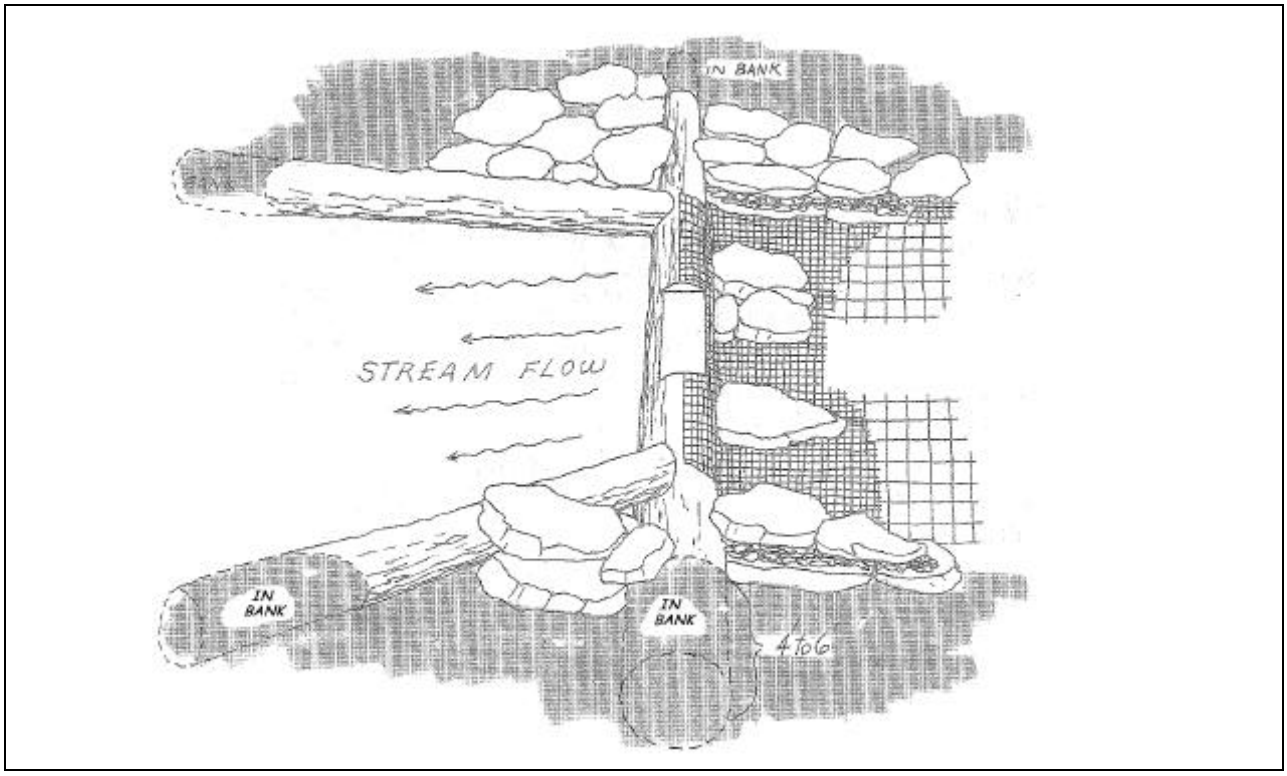


Wedge dam (Source: Forest Service Habitat Improvement Handbook)

Bull Gap Mine

K Dam

K Dams are best suited for streams < 15' wide. Use one log (> 16") to span the entire length of the stream. Attach braces to the main log at about an 45 degree angle. Cut a spillway into the main log to concentrate flow to the center of the stream. Attach hardware cloth to the main log as described above.



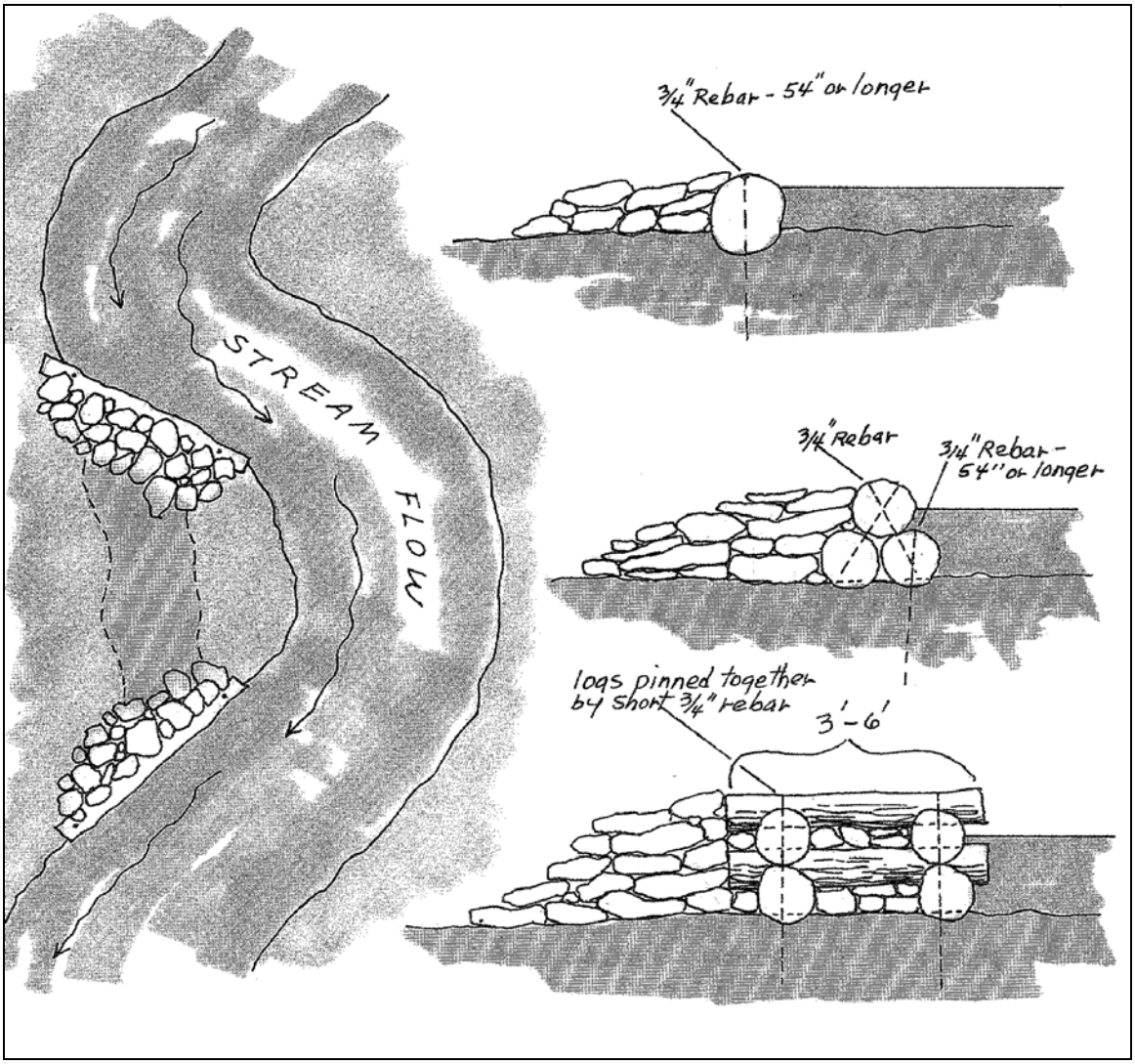
K-dam (Source: Forest Service Habitat Improvement Handbook)

Special Considerations
Washing underneath check dams is the most common failure.
Wedge dams are suitable for streams less than 30' wide. K dams should be used on streams less than 15' wide.
K dams create larger and deeper pools than wedge dams; however, maintenance is higher with K dams.
K dams are more difficult to install than wedge dams because greater excavation is needed to anchor the main log.

MAINTENANCE: Monitor for under washing and repair as necessary.

Channel Block

Log or log and crib structures installed across
stream meanders and oxbows to consolidate braided channels.
Channel blocks create deeper channels conducive for larger fish.
Blocks should be placed at the lower end of the flood channel as
well as the upper end to prevent head cutting.

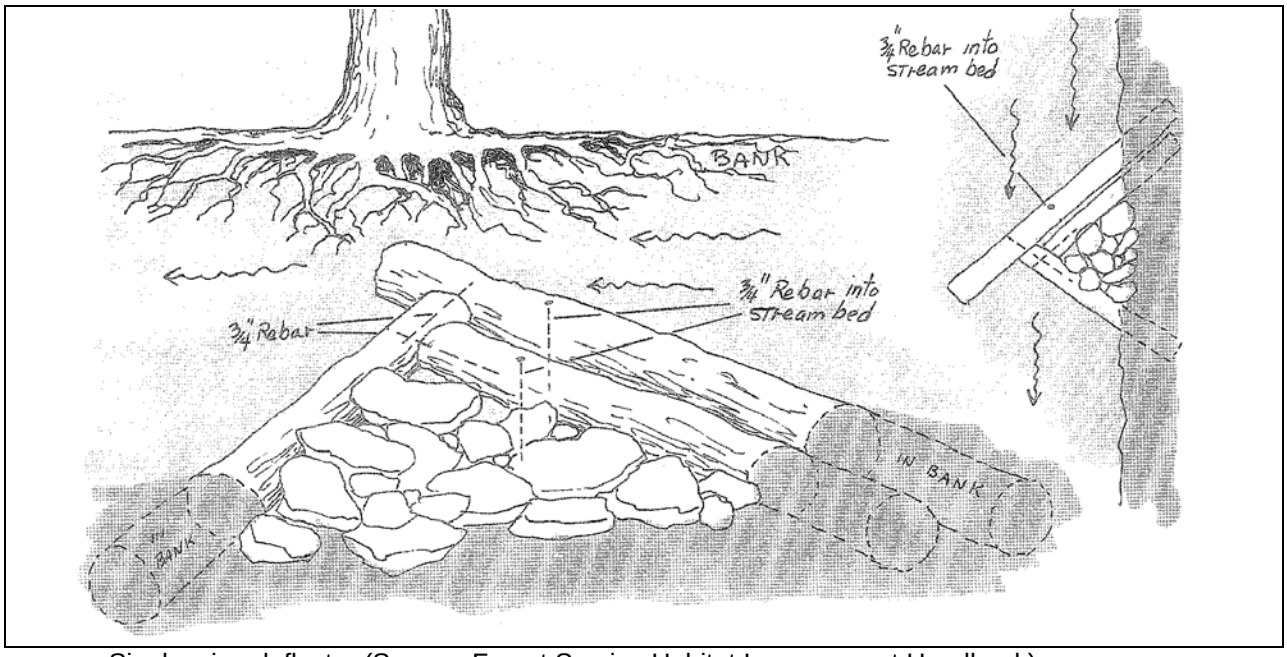


Channel blocks (Source: Forest Service Habitat Improvement Handbook)

Bull Gap Mine

Wing Deflectors

Log and stone structures that constrict and divert water flow so that stream meanders and pools are formed by scouring and relocation of fine sediment. Wing deflectors should be placed so that water is diverted toward a stable section of the streambank. The main deflector log should be placed at a 35 degree angle from the streambank, and supported with a downstream brace log.



Single-wing deflector (Source: Forest Service Habitat Improvement Handbook)

Rock Current Deflectors

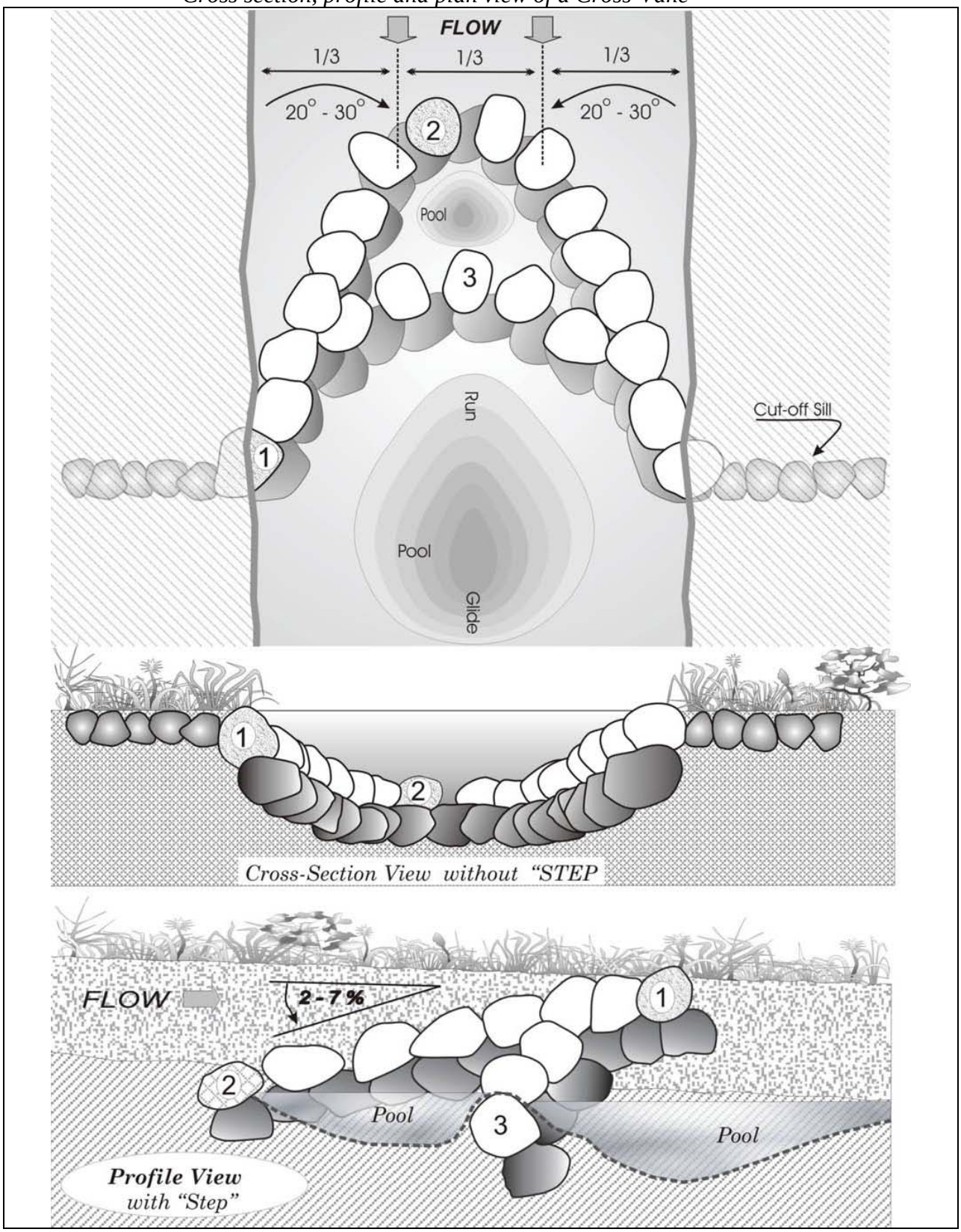
Rock current deflectors constrict flow to create artificial pool-riffle sequences. Riprap is dumped or handplaced as two facing triangles with their bases at each channel bank. To be effective, several sets of rock deflectors should be placed along a stream reach far enough apart, usually five to seven stream widths, to allow a pool-riffle sequence to develop. The structures should not be so high as to block flood flows.

Boulder (random) Placement

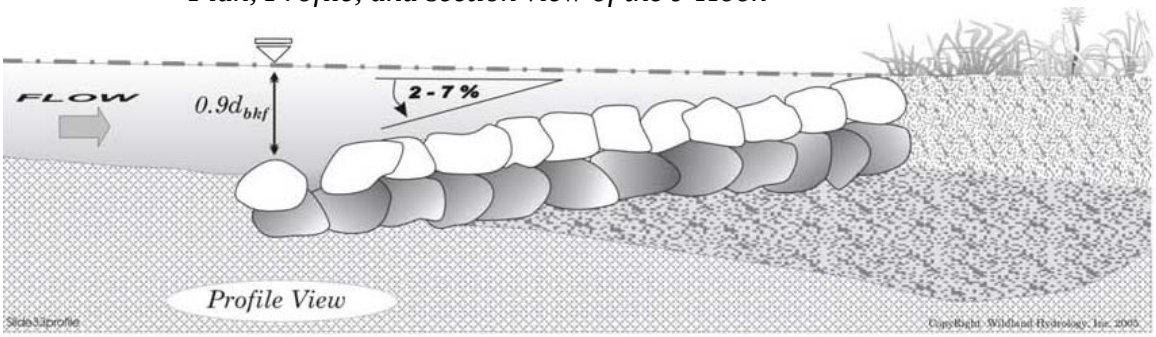
Boulders can be placed in most stream
locations including riffles, runs, flats, glides, and open pools.
Greatest benefits are likely to be achieved in currents > 2 ft/sec.
Boulders provide overhead cover and resting pockets.

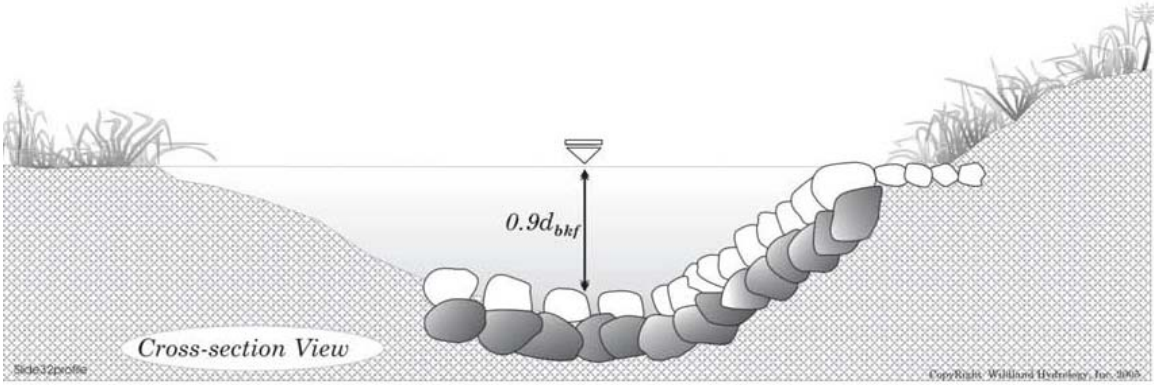
Boulder placement (Source: Forest Service Habitat Improvement Handbook)

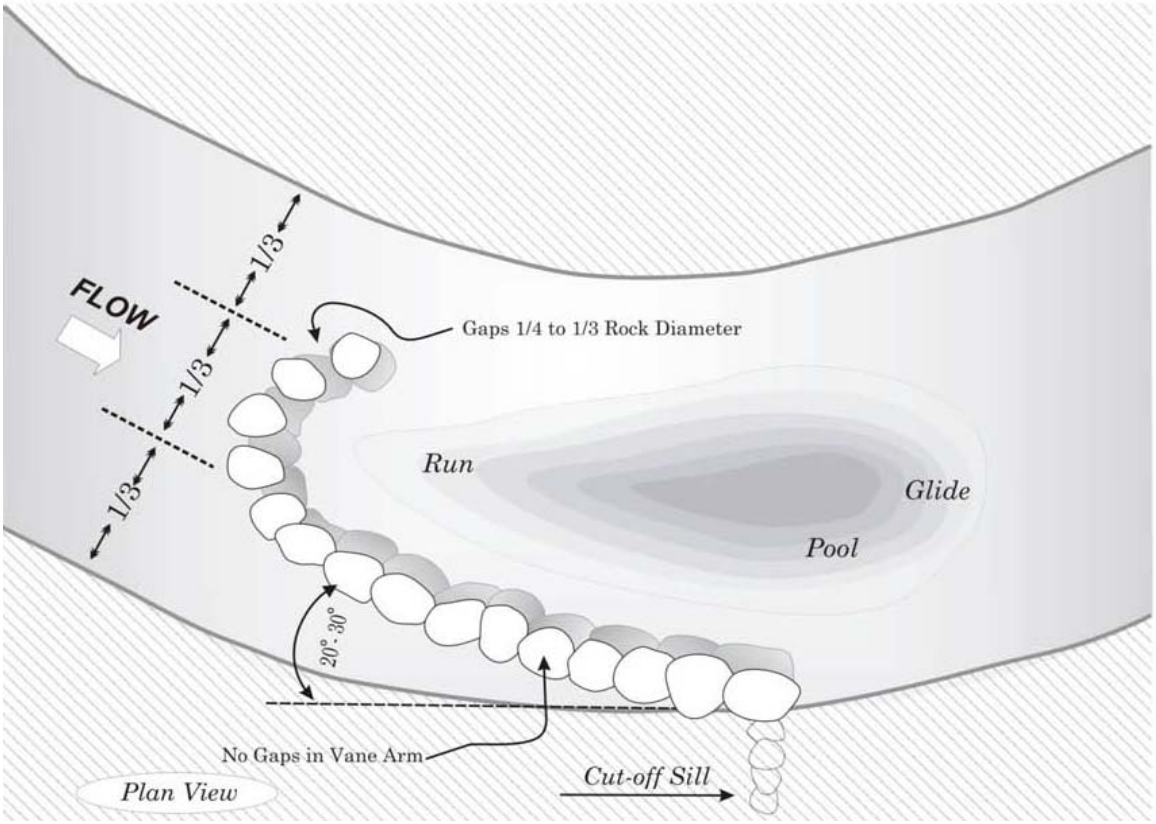
Cross section, profile and plan view of a Cross-Vane



Plan, Profile, and section view of the J-Hook-







Tree Planting

Alabama Guide Sheet No. AL 612

Definition

The establishment of tree species by planting seedlings.

Trees to Plant

The decision of what tree species to plant should be based on management objectives and soils. Some soils are best suited for growing pines and some soils are best suited for growing hardwoods. Other soils will grow either pines or hardwoods.

Transporting and Handling

Care should be taken in transporting and handling seedlings. Poor handling of seedlings in transport and before planting can result in tree planting failures. Tree roots may be killed by as little as five minutes exposure to the wind. Seedlings should be protected from heat and freezing temperatures.

Quality Criteria for Bareroot Pine Seedlings

	Loblolly, Slash, or Shortleaf	Longleaf
Stem Length	5 in	8 in (needle length)
Root Collar	1/8 in	3/8 in
Root Length	5 in	5 in
Lateral Roots	Abundant	Abundant
Winter Buds	———-	Present
Mycorrhizae	Present	Present

Quality Criteria for Bareroot Hardwood Seedlings

Root collar diameter ---------- 1/4 to 3/8 inch
Stem length ---------- 12 to 18 inches

Storage

Tree seedlings may be stored up to 12 weeks in refrigerated storage. In non-refrigerated storage, seedlings should only be stored two to three weeks when the storage temperatures range from 38 to 50 degrees Fahrenheit. Longleaf pine seedlings should be planted within three days of pickup from the nursery. If longleaf seedlings must be placed in cold storage prior to planting, store them no longer than two weeks. If seedlings freeze, allow them to thaw gradually before separating.

Planting Dates

Bareroot seedlings should be planted from December to March 15. Containerized seedlings may be planted from October through April. Seedlings planted late in the planting season are at a greater risk for mortality unless the site is wet.

Planting Methods

Trees may be planted by hand or machine. Pines may be hand-planted with dibble bars, hoedads or planting shovels. Hardwoods may be hand-planted with a shovel, power auger, post hole digger or a hardwood planting dibble. An acceptable planting machine for hardwoods would be one that has a coulter diameter

of at least 32 inches and a planting foot and trencher plate assembly to allow for the creation of a trench of four inches in width and fifteen inches in depth.

Planting Procedure

Trees should be planted to the proper depth and should receive adequate soil compaction. Tree roots should not be pruned. It is ok to plant seedlings with excessive lateral roots. If taproots consistently exceed 10 inches, contact the nursery where seedlings were purchased for guidance on what to do. Lean should not exceed 45 degrees.

Proper Seedling Depth

The planting depth for hardwoods and all pines except longleaf should be one to two inches deeper than they grew in the nursery. Longleaf should be planted with root collars at or slightly below ground level after the soil settles.

Herbaceous Weed Control

Herbicides may be used to increase seedling survival and growth by controlling weeds and grasses the first year after tree planting. Herbicides are usually applied over the top of tree seedlings and should be applied within six months after trees have been planted. Only herbicides that are labeled for over the top application should be used. Contact your local Alabama Forestry Commission Forester or a herbicide company representative for specific recommendations. Always follow label recommendations for rates and usage.

Tree Planting Rates

The number of trees for various spacings are:

6' x 8' = 908	9' x 9' = 538
7' x 7' = 889	9' x 10' = 484
6' x 10' = 726	8' x 12' = 454
8' x 8' = 681	10' x 11' = 436
7' x 10' = 622	9' x 12' = 403
6' x 12' = 605	11' x 11' = 360
8' x 10' = 544	12' x 12' = 302

References

USDA-NRCS AL Conservation Practice Standard 612 - Tree/Shrub Establishment. January 1999.

Alabama Forestry Commission Seedling Care and Reforestation Standards. November 1997.

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07/01

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

WETLAND CREATION

(Ac.)
CODE 658

DEFINITION

The creation of a wetland on a site that was historically non-wetland.

PURPOSE

To create wetland functions and values.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to sites where no natural wetland occurred historically and contains soil that are not hydric.

This practice is only applicable if hydrologic conditions can be created by modifying drainage and/or artificial flooding of a duration and frequency to create and maintain wetland conditions.

This practice does not apply to:

- a constructed wetland (656) intended to treat point and non-point sources of water pollution;
- wetland enhancement (659) intended to rehabilitate a degraded wetland where specific functions and/or values are enhanced beyond original conditions; or
- wetland restoration (657) intended to rehabilitate a degraded wetland where the soils, hydrology, vegetative community, and biological habitat are returned to approximate original wetland conditions.

CRITERIA

General Criteria Applicable to All Purposes

The purpose, goals and objectives of the creation shall be clearly defined, including the soils, hydrology and vegetation criteria that are to be met and are appropriate for the site and the project purposes.

The soil, hydrology and vegetative characteristics existing on the site and the contributing watershed shall be documented before the wetland is created.

Where known nutrient and pesticide contamination exists, the species selected will be tolerant of these conditions.

Upon completion, the site shall meet the appropriate wetland criteria and provide wetland functions and values as defined in the project's objectives.

Sites containing hazardous material shall be cleaned prior to the installation of this practice. Soil testing shall be used to determine appropriate actions to clean sites suspected of containing hazardous wastes.

Assure soil textures and types are suited for holding water and do not contain high levels of salt or other soil properties that may cause a resource concern.

Water rights shall be assured prior to creation.

Disturbance to ground nesting species shall be minimized.

Invasive species, federal/state listed noxious plant species, and nuisance species (e.g., those whose presence or overpopulation jeopardize the effectiveness of the practice) shall be

Conservation practice standards are periodically reviewed and updated. The current version of this standard can be obtained from your local Natural Resources Conservation Service office or can be downloaded from the electronic Field Office Technical Guide for Wyoming (Section IV, Conservation Practices) at http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=WY

controlled on the site. The establishment and/or use of non-native plant species shall be discouraged, and where possible, controlled.

The landowner shall obtain necessary local, state, and federal permits that apply before the practice is applied.

Criteria for Soils

Created wetlands shall be located in landscape positions and soil types capable of supporting the wetland functions and values.

Loosening of compacted soils, addition of organic matter, or other soil preparation activities, shall be accomplished where necessary to establish desired vegetation.

Criteria for Hydrology

The site shall be designed to create hydrologic conditions (including the timing of inflow and outflow, duration, and frequency) that provide the desired wetland functions and values.

Wetland micro- and macro-topography shall be created to achieve hydrologic diversity and enhance the desired effect.

The work associated with the wetland shall not adversely affect adjacent properties or other water users unless agreed to by signed written letter, easement or permit.

Engineering structures constructed for wetland creation shall approximate or mimic existing natural topography and micro- and macrotopography.

Existing drainage systems will be utilized, removed or modified as needed to achieve the intended purpose.

The standards and specifications for Dike (356) Pond (378), and Structure for Water Control (587) will be used as appropriate. Refer to the Engineering Field Handbook, Chapter 13, “Wetland Restoration, Enhancement, and Creation,” and 6, “Structures,” for additional design information.

Criteria for Vegetation

Establish hydrophytic vegetation typical for the wetland type(s) being established.

Preference shall be given to native wetland plants with localized genetic material. Plant materials collected or grown within a 200 mile radius from the site is considered local.

Where natural colonization of selected species will realistically dominate within 5 years, sites may be left to revegetate naturally. If a site has not become dominated by the targeted species within 5 years, active forms of revegetation may be required.

Adequate substrate material and site preparation necessary for proper establishment of the selected plant species shall be included in the design.

Where planting and/or seeding is necessary, the minimum number of native species to be established shall be based upon the types of vegetative communities present and the vegetation type planned. To achieve habitat diversity and minimize the adverse effects of climate, disease, and other limiting factors, several species adapted to the site will be established.

Seeding rates shall be based upon percentage of pure live seed to be tested within 6 months of planting.

CONSIDERATIONS

On sites where woody vegetation will dominate, consider adding 1 or 2 dead snags, tree stumps, or logs per acre, where appropriate, to provide structure and cover for wildlife and a carbon source for food chain support.

The potential for occurrence of federally listed species and/or state species or concern in categories NSS1 and NSS2 shall be evaluated for each site proposed for wetland creation.

Consider existing wetland and floodplain functions and/or values that may be adversely impacted.

Consider effect that wetland creation will have on disease vectors such as mosquitoes.

Consider effect of volumes and rates of runoff, infiltration, evaporation and transpiration on the water budget.

Consider effects on downstream flows or aquifers that would affect other water uses or users.

Consider the effect of water control structures on the ability of fish and other aquatic species to move in and out of the wetland.

Consider timing of water control to mimic the natural hydrological regime of a natural wetland in the area, further enhancing the habitat for aquatic species.

Consider linking wetlands by corridors of vegetation or habitat wherever appropriate to enhance the wetland's use and colonization by the native flora and fauna.

Consider establishing vegetative buffers on surrounding uplands to reduce sediment and soluble and sediment-attached substance carried by runoff and/or wind.

Consider effects on temperature of water resources to prevent undesired effects on aquatic and wildlife communities.

Soil disturbance associated with the installation of this practice may increase the potential for invasion by unwanted species.

Consider micro-topography, hydrology and hydroperiod when determining which species of vegetation to plant.

Where visual quality would be impacted by structures (e.g., outlet structures, dikes, etc.), consider using low profile structures, natural screening, and or colors that minimize the impact.

Consider controlling water levels to prevent oxidation of organic soils and inundated organic matter and materials.

Consider the effects that location, installation and management may have on subsurface cultural resources.

PLANS AND SPECIFICATIONS

Specifications for this practice shall be prepared for each site. Specifications shall be recorded using approved specifications sheets, job sheets, narrative statements in the conservation plan, or other documentation. Requirements for the operation and maintenance of the practice shall be incorporated into site specifications. Plans and specifications should be reviewed by staff with appropriate training in design and implementation of wetland restoration.

OPERATION AND MAINTENANCE

The following actions shall be carried out to insure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance):

Any use of fertilizers, mechanical treatments, prescribed burning, pesticides and other chemicals to assure the wetland enhancement function shall not compromise the intended purpose.

Control of undesirable plant species and pests using biological means (e.g., use of predator or parasitic species), or by manipulation of water levels shall be implemented where available and feasible.

Timing and level setting of water control structures is required for the establishment of desired hydrologic conditions, for management of vegetation and for optimum wildlife and fish use.

An inspection schedule shall be established for embankments and structures for damage assessment.

Management actions shall maintain vegetation and control unwanted vegetation.

Haying and grazing will be used as appropriate to manage vegetation, but in consideration of maintaining wetland functions and values as well as fish and wildlife habitat.

The control of water depth and duration may be utilized to control unwanted vegetation.

REFERENCES

Endangered Species Act of 1973, as amended, Section 7, p 19 – 28.

Executive Order 13112, Invasive Species, February 3, 1999. Federal Register: vol.64, no.25. Feb. 8, 1999.

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Hurt, G.W. and V.W. Carlisle, 2001. Delineating Hydric Soils, in Wetland Soils – Genesis, Hydrology, Landscapes and Classification. Edited by J.L. Richardson and M.J Vepraskas. CRC Press, Boca Raton, FL pp. 183 – 206.

Kingsbury, Bruce & Joanne Gibson, 2002. Habitat Management Guidelines for Amphibians and Reptiles of the Midwest. Partners in Amphibian & Reptile Conservation, Ft Wayne IN, 57 pp.

Maschhoff, Justin T & James H. Dooley, 2001. Functional Requirements and Design Parameters for Restocking Coarse Woody Features in Restored Wetlands, ASAE Meeting Presentation, Paper No: 012059.

USDA, NRCS. 2002. Field Indicators of Hydric Soils in the U.S., Version 5.0. G.W. Hurt, P.M. Whited and R.F. Pringle (eds.). USDA, NRCS in cooperation with the National Technical Committee for Hydric Soils, Fort Worth, TX.

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Vepraskas, M.J., ands S. W. Sprecher (eds), 1997. Aquic Conditions and Hydric Soils: The Problem Soils. Soil Science Society of America Special Publication Number 50. SSSA, Inc. Madison, WI.

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

RIPARIAN FOREST BUFFER
(Acre)
CODE 391

DEFINITION

An area of trees, shrubs and other vegetation located in areas adjacent to and upgradient from water bodies.

PURPOSE

The purpose of this practice is to:

* Reduce excess amounts of sediment, organic material, nutrients and pesticides and other pollutants in surface runoff and reduce excess nutrients and other chemicals in shallow ground water flow

* Create shade to lower water temperatures to improve habitat for fish and other aquatic organisms

* Provide a source of detritus and large woody debris for fish and other aquatic organisms and riparian habitat and corridors for wildlife

* Provide room for water courses to establish geomorphic stability.

* Create riparian habitat and corridors for wildlife.

The riparian buffer strip will be most effective when used as a component of a total resource management system including nutrient management, pest management, and erosion, runoff and sediment control practices.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to stable areas, which are adjacent to or immediately upgradient of: perennial or intermittent streams; rivers; lakes; ponds; sinkholes; wetlands types 1 (bottomland hardwood sites only) and types 6, 7, 8.

Where existing perennial vegetation is already established, directly adjacent to the water body, the forest riparian buffer will apply to the area directly upslope of the existing vegetation within the maximum buffer width allowable.

CRITERIA

General Criteria Applicable To All Purposes Listed Above:

The location, width, layout and woody plant density of the riparian forest buffer will accomplish the intended purpose and function. The design width shown for each criteria includes any existing natural woody vegetation. The buffer will consist of the following distinct zones:

Zone 1

Zone 1 will begin at the normal water line or at the upper edge of the active channel and extend a minimum distance of 35 feet, measured horizontally on a line perpendicular to the watercourse or water body.

Where equipment access corridors are necessary adjacent to stream channels, a strip no more than 40 feet in length adjacent to the stream may be maintained in low shrubs or herbaceous plants. If possible restrict access to one side only preferably the north or east bank. Wider channels may require access on both sides.

Zone 2

When appropriate or as desired by the landowner an additional strip or area of land (Zone 2) can be added to Zone 1, extending the buffer to meet the needs of the site and to accomplish the intended purpose of the buffer. Zone 2 will begin at the upslope edge of Zone 1 and extend a minimum distance to provide the designed function of the buffer.

ADDITIONAL CRITERIA TO REDUCE EXCESS AMOUNTS OF SEDIMENT, ORGANIC MATERIAL, NUTRIENTS, PESTICIDES, AND OTHER POLLUTANTS IN SURFACE RUNOFF AND REDUCE EXCESS NUTRIENTS AND OTHER CHEMICALS IN SHALLOW GROUND WATER FLOW.

An additional strip or area of land, zone 2, will begin at the edge and up-gradient of zone 1 and extend a minimum distance of 65 feet, measured horizontally on a line perpendicular to the water course or water body. The minimum combined width of zones 1 and 2 will be

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

100 feet or 30 percent of the geomorphic floodplain whichever is less, but not less than 35 feet. Figure 1 illustrates examples of zone 1 and zone 2 widths for water courses and water bodies designed for this criteria.

ADDITIONAL CRITERIA TO IMPROVE AND ENHANCE SELECTED WILDLIFE SPECIES AND THEIR HABITATS

Widths below are considered the minimum desired width (zones 1 and 2 combined) to adequately provide resource protection including habitat enhancement for the listed species. The widths listed pertain to one or both sides of water courses or water bodies but shall not exceed to 100 year floodplain.

Species:	**Width in Feet**
Bald eagle, cavity nesting ducks, heron rookery, sandhill crane	600
Common Loon, Pileated woodpecker	450
Beaver, dabbling ducks, mink	300
Deer	200
Frog, salamander	100

ADDITIONAL CRITERIA TO PROVIDE MULTIPLE RESOURCE PROTECTION

To achieve multiple resource protection objectives, including potential flood damage reduction, water and air quality enhancement, watershed protection, bottomland hardwood forest restoration, and water course geomorphic stability riparian forest buffers located upslope and adjacent to rivers or perennial and intermittent streams can be expanded beyond the width requirements for wildlife. Natural resource planners can set the minimum combined width of zones 1 and 2 to include the entire riparian area, not to exceed the 100 year floodplain. The entire riparian area can be approximated by multiplying the width of the river or stream at the ordinary high water mark by 10 and adding 50 feet. The buffer width associated with this calculation will be adjusted downward not to exceed the 100 year floodplain. The width determination of this definition pertains to one side of the water course. To obtain the total riparian width associated with both sides of a water course multiply the area determined above by 2.

ADDITIONAL CRITERIA TO CREATE SHADE TO LOWER WATER TEMPERATURES TO IMPROVE HABITAT FOR FISH AND OTHER AQUATIC ORGANISMS.

A buffer for lowering warm-season water temperatures shall consist of at least zone 1 for: 1) water course reaches or water bodies less than or equal to 30 feet in width or; 2) water bodies greater than 30 feet in width but less than 1 acre.

Buffers shall be established or maintained on the south and west sides of the water courses to the greatest extent practical. The buffer canopy shall be established to achieve at least 50 percent crown cover with average canopy heights equal to or greater than the width of the water course or 30 feet for water bodies. See figure 2.

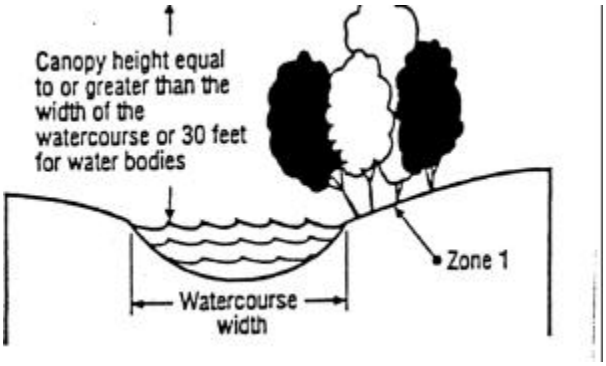
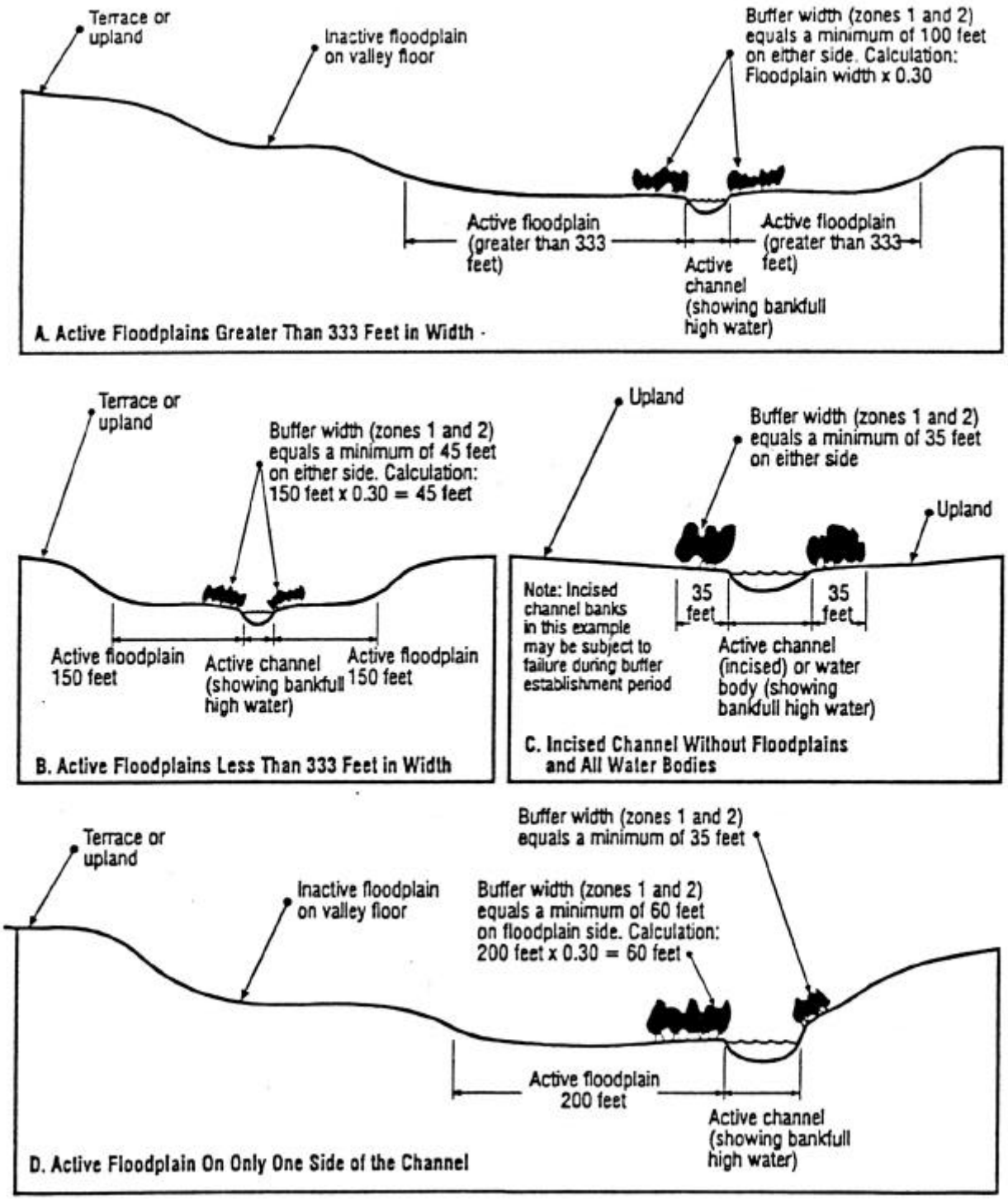


Figure 2 Canopy height for water temperature control.

Buffer species shall include those listed in Table 1 or other appropriate native species. Place drooping or wide-crowned trees and shrubs nearest the water course or body. Shoreline or channel relief and topographic shading will be taken into account in selecting species.

Figure 1: Examples of riparian buffer widths designed using the water quality criteria. The minimum width of zones 1 and 2 will be 100 feet or 30% of the geomorphic floodplain, whichever is less but not less than 35 feet.



ADDITIONAL CRITERIA TO PROVIDE A SOURCE OF DETRITUS AND LARGE WOODY DEBRIS FOR FISH AND OTHER AQUATIC ORGANISMS.

Within zone 1 as a minimum, establish, favor or manage species capable of producing stems and limbs of sufficient size to provide an eventual source of large woody debris for in-stream habitat for fish and other aquatic organisms.

Overland Flow

Runoff to be buffered or filtered by Zone 2 will be limited to shallow, overland sheet flow only. Shaping and grading of the area immediately upslope from the buffer and the buffer strip itself may be necessary to insure shallow, overland sheet flow. Concentrated flows must be converted to sheet flow prior to entering Zone 2. This includes converting water carried by waterways and ditches into sheet flow conditions.

Buffer Establishment

Dominant vegetation will consist of existing or planted trees and shrubs suited to the site and the intended purpose. Planted woody perennial vegetation will be composed of riparian trees and shrubs suitable to the site and soil. Emphasis will be placed on the use of locally native species. Plantings will consist of two or more species with individual plants suited to the seasonal variation of soil moisture at specific planting sites. Nitrogen fixing species should be discouraged where nitrogen removal or buffering is desired.

Natural Revegetation

Where frequent flooding makes tree planting impractical, revegetation can be accomplished by enhancing or allowing natural succession to occur. Where natural revegetation is allowed, an adequate stand will require at least 300 well spaced, trees and/or shrubs per acre at the end of the third growing season. If 300 stems per acre are not present a technical determination will be made to determine if additional planting is recommended based on the original stocking level of the site. If the existing stocking rate is less than 40% of the original stocking rate supplemental planting will be recommended. If the existing stocking rate in between 40% and 70% of the original stocking the recommendation to plant additional trees will be made on a site specific basis.

Planting

Planting densities for trees and shrubs will depend on the species and their potential height at 20 years of age. Heights may be estimated based on: 1) performance of the individual species (or comparable species) in nearby areas on similar sites, or 2) predetermined and documented heights using Section II-N of the FOTG, Windbreak Suitability Groups. Planting density recommendations are:

Plant Types/Heights	Plant-to-Plant Spacing in feet
* Shrubs less than 10 feet in height	3 to 6
* Shrubs and trees from 10 to 25 feet in height	5 to 10
* Trees greater than 25 feet in height	8 to 14

Refer to Table 1 for woody species commonly associated with and suited to riparian areas.

Refer to Standard 612, Tree Planting for additional information on the age, size, handling, storage and quality of planting stock.

Bared root stock plantings shall be completed as soon as practical in the spring when soil, site, and weather conditions are suitable. Containerized or potted stock plantings may be completed in the fall provided soil moisture is adequate.

Planting Site Preparation

Necessary site preparation shall be done at a time and manner to insure survival and growth of planted species. Only viable, high quality and adapted planting stock will be used. Planting sites shall be properly prepared based on the soil type and vegetative conditions listed below. For sites to be tilled leave a minimum 3 foot untreated strip at the edge of the bank or shoreline. Avoid sites that have had recent applications of pesticides harmful to woody species. If pesticides are used, apply only when needed and handle and dispose of properly and within federal, state, and local regulations. Follow label directions and precautions listed on containers.

Geo-textile fabric mulch and other appropriate mulch materials may be used for weed control and moisture conservation for new plantings on all sites.

Appropriate mulch materials must allow for water infiltration and air exchange.

Based on the site conditions and soils procedures to prepare sites include:

Sod and Alfalfa

Till (moldboard plow, disk plow, rototiller or similar equipment) in the fall before planting. Fall seeded temporary cover may be used where needed to control erosion.

Sod may be killed by non-selective herbicides. These herbicides are most effective when used in the year prior to planting with stock planted into the residue. On heavy soils, tillage is usually necessary to achieve a satisfactory planting when a tree planting machine is used.

Small Grain or Row Crop Sites

If the site is in row crop, till (moldboard plow, disk plow, rototiller or similar equipment) in the fall or in the spring prior to planting. If the site has a plow pan or hard pan in the subsoil perform a deep disking or ripping operation in the fall. Fall seeded cover crops may be used where needed to control erosion.

If the site is in small grain stubble, planting can be done in the spring without further preparation. If fabric mulch or other mulch materials are to be installed till in the spring before planting.

Tillage on steep slopes must be done on the contour or cross-slope. Cover crops between the rows may be established, where needed, to control erosion and sediment deposition on planted stock.

On sites where it is not practical or possible to operate equipment, where tillage of the site will cause excessive erosion or where tillage of the site is impractical the methods listed below may be used.

* Machine or hand scalp an area at least 36 inches in diameter and place planted stock in the center of the scalped area.

* Rototill a strip at least 36 inches wide the year prior to planting and plant stock in the center of the tilled area.

* Kill the vegetation in a 36 inch diameter or larger area with a non-selective herbicide. This is most effective when done the year prior to planting. Plant the stock in the center of the treated area.

Sites with undesirable brush will need initial treatments that physically removes and kills the brush species to facilitate planting of desired stock and prevents re-encroachment of the brush. Suitable methods include hand-cutting and removal, brush hogging, brush blading, or other equivalent procedure with repeated treatment or use of herbicides to control resprouting.

Temporary plantings or cover may be needed for streambank stabilization during the establishment period.

Livestock shall be controlled or excluded as necessary to achieve and maintain the intended purpose.

Harmful pests present on the site shall be controlled or eliminated as necessary.

CONSIDERATIONS

The severity of bank erosion and its influence on existing or potential riparian trees and shrubs should be assessed. Watershed-level treatment or bank stability activities may be needed before establishing a riparian forest buffer.

Complex ownership patterns of riparian areas may require group planning for proper buffer design, function and management.

Where ephemeral, concentrated flow erosion and sedimentation is a concern within zone 2 or in the area upslope of zone 2 consider the application of a vegetated strip consisting of grasses and forbes. Stiff stemmed grasses at the up-gradient edge of zone 2 will accelerate deposition of sediment (see figure 3). Criteria from standard 393, Filter Strip, will be used in designing this grass strip.

Favor tree and shrub species that are native and that have multiple values such as those suited for timber, biomass, nuts, fruit, nesting, and aesthetics. Also consider used of species that have a tolerance to locally used herbicides.

Consider the use of species that resprout or can be propagated by layering when establishing new rows nearest to water courses or bodies.

Joining of existing and new buffers increases the continuity of cover and will further moderate water temperatures. A mix of species with growth forms that are tall and wide-crowned or drooping will increase

moderation effects. For water courses, buffers established on both sides will enhance multiple values.

When concentrated flow erosion and sedimentation cannot be controlled vegetatively consider structural or mechanical treatments.

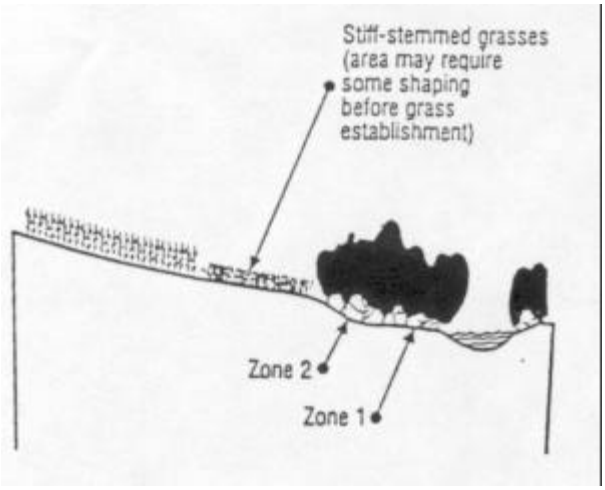


Figure 3. Control of concentrated flow erosion

Avoid tree and shrub species which may be alternate hosts to undesirable pests or that may be considered noxious or undesirable. Species diversity should be considered to avoid loss of function due to species specific pests.

The location, layout and density of the buffer should complement natural features. Avoid designs or locations that would concentrate flood flows or return flows. Flexible-stemmed shrubs will minimize obstruction of local flood flows. Avoid establishing buffers in windthrow prone locations.

Woody species which obtain water by the penetration of their roots into the water table (phreatophytes) and hydrophytes that can potentially deplete ground water should be used with caution in water-deficit areas.

Consider the positive and negative impacts beaver, muskrat, deer, rabbits and other wildlife species may have on establishment of woody plants. Temporary and local population control methods of these kinds of wildlife should only be used within state and local regulations.

Consider the type of human use and the aesthetic, social and safety aspects of the area when determining the vegetation selection, arrangement and management. For example, avoiding shrubs that block views near recreation trails. Species selection to improve aesthetics include seasonal foliage color, showy flowers, and fruit, foliage texture, form and branching habit.

Consider the additional benefits and values of expanding the buffer beyond the minimum width. In cases where the expanded buffer exceeds the 100 year flood plain refer to Standard 612, Tree Planting for information on tree establishment.

PLANS AND SPECIFICATIONS

Plans and specifications for establishment and maintenance of this practice shall be prepared for each site. Plans and specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan or other acceptable documents. These documents are to specify the requirements for installing the practice, such as the kind, amount or quality of materials to be used, or the timing or sequence of installation activities. Requirements for operation and maintenance of the practice shall be incorporated into site specifications.

OPERATION AND MAINTENANCE

The following actions shall be carried out to insure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice and repair and upkeep of the practice.

The riparian forest buffers will be inspected periodically, protected and restored as needed from adverse impacts such as excessive traffic, pest infestations, pesticide use on adjacent lands, livestock use and fire.

As applicable control of concentrated flow erosion shall be continued in the area up-gradient of zone 2 to maintain buffer function. Following severe storms check for evidence of sediment deposit, erosion or concentrated flow channels. Prompt corrective action needs to be taken to stop erosion and restore sheet flow.

Replacement of dead trees or shrubs and control of undesirable vegetative competition will be continued until the buffer is in a fully functional condition.

The following should be avoided within the buffer strips: excess use of fertilizers, pesticides, or other chemicals and removal or disturbance of vegetation and

litter inconsistent with erosion control and buffering objectives.

Zone 1 vegetation should remain undisturbed except for removal of individual trees that could present an usual hazard, such as potentially blocking culverts or creating dangerous hydraulic obstructions.

As Zone 1 approaches 40 years of age, it will begin to produce large stable debris. Large debris, such as logs, create small dams which trap and hold detritus for processing by aquatic insects thus adding energy to the stream ecosystem, strengthening for food chain and improving aquatic habitat. Wherever possible, stable debris should be conserved.

Where debris dams must be removed, try to retain useful, stable portions which provide detritus storage. Remove unstable and smaller debris which will contribute to unwanted debris jams. Deposit removed material a sufficient distance from the stream so that it will not be refloated by high water.

Management of Zone 1 will be limited to bank stabilization and removal of problem vegetation. Zone 2 vegetation, undergrowth, forest floor, duff layer and leaf litter shall remain undisturbed except for: the periodic cutting of trees to remove sequestered nutrients; or for spot site preparation for regeneration purposes. Logging and other overland equipment traffic shall be excluded except for streamcrossing and stream stabilization work.

Additional operation and maintenance requirements shall be developed on a site-specific basis to assure performance of the practice as intended.

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TABLE 1: Woody Species Recommendations for Establishing Forest Riparian Buffers

Species:		Flooding Tolerance	Large Debris	Shade Value	Wildlife Merit	Potential Height
American cranberry	Viburnum trilbum	H-M	L	L	H	16
American plum	Prunus americana	L-M	L	L	H	10
Arrowwood	Viburnum dentatum	H	L	L	H	8
Ash, green	Fraxinus pennsylvanica	M	M	H	M	60
white	Fraxinus americana	M	M	H	M	80
black	Fraxinus nigra	H-M	M	M	M	70
Birch, white	Betula papyrifera	M-H	M	M	H	70
river	Betula nigra	M-H	M	M	M	70
yellow	Betula alleghaniensis	M-H	H	M	H	60
Basswood	Tilia americana	L-M	H	H	L	100
Cedar, Red	Juniperus virginiana	M	M	H	H	40
White	Thuja occidentlis	H-M	M	H	H	50
Chokecherry	Prunus virginiana	L-M	L	L	H	30
Cottonwood	Populus deltoides	H-V	H	H-V	M	100
Dogwood, red-osier	Cornus stolonifera	H	L	L	M	10
silky	Cornus stolonifera	H	L	L	M	10
gray	Cornus racemosa	M	L	L	M	10
Fir, Balsam	Abies balsamea	M-H	M	M	H	60
Hackberry	Celtis occidentalis	M	M-H	H	H	100
Hawthorne	Crataegus crusgalli	M	L	L	H	25
Hazelnut	Corylus americana	M	L	L	H	25
Honeylocust	Gleditsia triacanthoa	L	L	L	L	75
Maple, silver	Acer saccharinum	H	H	H	M	95
red	Acer rubrum	M-H	H	H	M-H	70
Nannyberry	Viburnum lentago	M	L	L	H	14
Ninebark	Physocarpus opulifulius	L	L	L	H-M	10
Oak, bur	Quercus macrocarpa	H-M	H	H	H	80
pin	Quercus ellipsoidalis	M-L	H	H	H	75
red	Quercus rubrum	L	H	H	H	80
swamp white	Quercus bicolor	H	M	H	H	70
Pine, jack	Pinus banksiana	L	L	M	L	80
red	Pinus rubrum	M	H	M	M	80
white	Pinus stobus	M	H	H	H	100
Spruce, black	Picea mariana	H-V	M	M	M-H	70
white	Picea abies	M-L	H	M-H	H	80
Serviceberry	Amelanchier alnifolia	M-L	L	L	H	12
Tamarack	Larix jaricina	H-M	H	M	M	75
Walnut, black	Juglans nigra	L	M	M	H	60
white	Juglans cinerea	L	M	M	H	60
Willow, black	Salix nigra	H	M	H	M	60
sandbar	Salix exigua	H-V	L	L	L	8
peachleaf	Salix amygdaloides	H	L	L	L	25

* - This is not an all inclusive list of species to plant or a list of only those species eligible for establishment with cost share. All native species which are locally adapted may be recommended for establishment. Additional references you may want to consult for species recommendations include: "Trees and Large Shrubs: Species Native to Minnesota's Ecological Regions" by MN/DNR Division of Forestry and "Minnesota Tree Handbook" by MASWCD

* - Refer to Windbreak Suitability groups in Section II of the FOTG for additional information on suitability of trees and shrubs for specific soils

Relative ranking values: V = Very high; H = High; M = Medium; L = Low

Flooding Tolerance describes the relative capacity of the species to survive standing water or anaerobic soil conditions. Species shown with a "V" ranking have the ability to survive deep, prolonged flooding; "H" the ability to survive flooding for one growing season, with significant mortality occurring if flooding is repeated the following year; "M" the ability to survive flooding or saturated soils for 30 consecutive days during the growing season; "L" relatively unable to survive more than a few days of flooding during the growing season without significant mortality.

Large Debris describes the relative potential for the species to produce woody debris larger than ten inches in diameter before senescence. "H" indicates that large debris is likely within the species life span; "M" indicates that large debris is possible within the species life span; "L" indicates that large debris is unlikely.

Shade Value describes the density or degree of shade provided by the species' crown canopy in leaf out condition. "H" indicates that the species has a large crown canopy capable of providing full shade; "M" indicates that the species has a medium or narrower crown and/or an open grown canopy that provides partial shade; "L" indicates that the species is open grown, has a small canopy, or is too short to provide anything except minimal shade.

Wildlife Merit describes the relative potential for the species to be valuable for wildlife including providing useful cavity sites, quality nesting cover, or quality fruit and food production. "H" indicates excellent large cavity potential, nesting cover or fruit production; "M" indicates moderate cavity potential, nesting cover or fruit production; "L" indicates low cavity potential, nesting cover, or fruit production.

Potential Height indicates the species' potential height at maturity.